Diamond Review Phase II: Efficiency and Effectiveness in Higher Education

Case Studies of Delivering Value from the Higher Education Estate

Universities UK | The voice of UK universities

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CONTENTS

1. Introduction

This report brings together six case studies which explore different aspects of estate use. They illustrate how individual institutions are making efficiency gains and working to deliver increased value from their estates to the benefit of students, the economy and local communities.

The report is one element of the estates work stream - part of the work on Phase II of the Sir Ian Diamond's Review into efficiency and effectiveness in higher education. It accompanies the main report *Delivering Value from the Higher Education Estate*[1].

Each of the case studies and their key features are summarised here in the introduction. The remaining sections of the report provide more information about them and discuss the existing and projected impact of the actions taken by the six higher education institutions which have kindly participated in the study: Coventry University, Imperial College, Loughborough University, Manchester Metropolitan University, the University of Strathclyde and the University of Sunderland.

Coventry University - The Engineering and Computing Building

Coventry University opened the new Engineering and Computing Building (ECB) in 2012. The innovative design, technology led environment and management of the building fully support the Faculty's Activity Led Learning approach to teaching. The ECB was specifically designed to encourage and facilitate the study of STEM subjects and to increase the number of technologically well qualified, industry-ready graduates to support the economy and increase advanced manufacturing capacity. The building also actively supports the Faculty's large research and commercial activities portfolio and substantial outreach programme of work.

Key points from the case study:

- New fit for purpose, accessible space to replace dispersed and outdated accommodation and to accommodate growth
- Space that promotes increased levels of collaboration and engagement between departments, staff, students and visitors
- Space designed to support the Faculty's Activity Led Learning approach to teaching
- Very positive student feedback and increased utilisation
- Flexibility in the use of general purpose and specialist space
- Year-round use
- Shared staff accommodation supporting different ways of working
- Environmental sustainability – BREEAM excellent building.

Imperial West – Imperial College's Campus in White City

Imperial College is developing a new campus, Imperial West, in White City, West London. Imperial West will provide the College with the capacity and opportunity for further growth and development which would not otherwise be feasible given the development constraints on the South Kensington Campus.

[1] Available from the AUDE website at www.aude.ac.uk

Key features of this case study:

- Providing the environment for levering value from academic endeavour
- Significant expansion of the facilities available to the College to undertake world leading research and education
- Meeting the needs of London's growing enterprise community
- Emphasis on linking research and commerce
- Flexible buildings procured on a rigorous commercial basis
- Delivering value from investment by optimising site capacity and land uses
- Imperial to take an anchor role in supporting regeneration in White City.

Loughborough University - new uses for a historic building

This case study centres on the conversion of a historic building from its original use as a student hall of residence into flexible shared offices for the Vice Chancellor and administration teams.

Key points from the case study are:

- Efficient and effective re-use of a historic building in a conservation area which was no longer fit for purpose for its original use as student accommodation
- Key enabling role in delivering the master plan for co-location of departments
- Delivering space efficiencies in office use as well as providing an improved internal working environment for staff
- Creation of open plan working for the Vice Chancellor's Office: the senior team of four are leading by example in adopting new office working practices
- Implementation supported by clear Space Policy
- Contributing to the carbon reduction policy
- Retaining the historic features of the building while providing modern open plan offices.

Manchester Metropolitan University – delivering the strategy

Manchester Metropolitan University (MMU) is the one of the largest campus based undergraduate universities in the UK with a student population of over 30,000. Over the past ten years, MMU has implemented a major rationalisation and renewal strategy for its estate. Implementation of the strategy has transformed the estate and improved the delivery of academic teaching and research activity. It has seen the University reduce the number of campuses from seven to two resulting in a high quality, consolidated and sustainable estate.

Key points from this case study are:

- Clear and longstanding strategy for campus rationalisation
- Strong leadership and commitment: consistency of purpose
- Delivery of new high quality sustainable buildings to replace older dispersed facilities
- Positive impact on the student experience
- Positive impact on the locality and benefits for the community
- Space and cost efficiencies.

University of Strathclyde - Technology and Innovation Centre

The University of Strathclyde is developing a centre for technological research, the Technology and Innovation Centre, in Glasgow City Centre to enable academic staff and industry partners to work together and collaborate on innovative technology programmes. The centre is currently under construction.

Key features of the case study are:

- Transformational project in Glasgow City Centre
- Major project contributing to city centre economic development and regeneration
- Facilities to deliver innovation, collaboration and partnership between industry and the University
- Provision of specialist, shared and flexible laboratory facilities to accommodate changing needs
- Low carbon and low energy building.

University of Sunderland - Sciences Complex Refurbishment Project

The case study is about the University of Sunderland's Sciences Complex Refurbishment Project. The upgraded facilities have now been in use for three years. Over £7million were invested in the development to upgrade and reconfigure more than 4,000 square metres within the complex. The refurbishment was part of wider change project within the Faculty of Applied Sciences which centred on collaboration, partnership and new ways of learning and working. This case study looks at the changes made to the Sciences Complex buildings, including their use and management, to support these innovations.

Key features of the case study include:

- Reinvigoration of existing buildings to provide upgraded laboratory, teaching and office facilities
- Transition from department-owned to cross-faculty facilities
- New work environments for staff supporting interaction and collaboration
- Provision of flexible and effective laboratory research facilities
- Accommodating larger group sizes in laboratories and increasing utilisation
- Efficient space use of shared facilities supported by good practice in timetabling
- Positive impact on the student experience
- Vacating poor quality space as a result of efficiencies in space use through consolidation and shared facilities.

The University of Sunderland has implemented a strategy of consolidation on two campuses. By reducing duplication and providing fit for purpose facilities, the University has been able to rationalise and reduce the size of its estate by over 15 per cent.

2. Coventry University - Engineering and Computing Building

Coventry University opened the new Engineering and Computing Building (ECB) in 2012. The innovative design, technology led environment and management of the building fully support the Faculty's Activity Led Learning approach to teaching. The ECB was specifically designed to encourage and facilitate the study of STEM subjects and to increase the number of technologically well qualified, industry-ready graduates to support the economy and increase advanced manufacturing capacity. The building also actively supports the Faculty's large research and commercial activities portfolio and substantial outreach programme of work.

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Coventry University's estate

The city centre campus is made up of around 20 buildings, the ECB being the newest. It is located next to the Lanchester Library, which opened in 2001, and is within easy walking distance of much of the campus.

Most campus buildings date from the 1950s, 60s and 70s, although some are older. For example, the Faculty of Business, Environment and Society occupies the William Morris Building, constructed in 1910 as part of the engineering production plant for the Morris Car Company.

The University's strategy is to renew and replace buildings no longer fit for purpose as part of the overall £160million redevelopment plan for the city centre campus. The ECB is a key component of the redevelopment plan. The University plans to undertake further major investment over the next ten years.

Decision to build the ECB

Planning for the new ECB began in 2007, and symbolised the University's investment in, and commitment to, STEM subjects. The Faculty of Engineering and Computing was spread across ten buildings of varying age and condition. This caused problems for collaboration between the Faculty's departments, students and staff, and to academic delivery and the student experience. The vision to bring people together in one place to create a better experience for all was the driving force behind the move. In addition, the Faculty's continuing growth meant that it was short of expansion space. The buildings it occupied were inefficient and unsuitable both to accommodate future growth plans and to deliver the learning experience that the Faculty wished to provide to students.

Philosophy for the building

The University wanted the building to deliver its vision for learning and teaching in the Faculty. The vision represented a step-change in teaching pedagogy and had three key elements:

I. **Communities of learners** – the building needed to stimulate shared learning and collaboration for students and staff, creating a 'community of learners'. The ECB achieves this through a series of interconnected, multi-purpose, flexible spaces that are used for both occupation and circulation and which are designed to facilitate contact in a more informal, integrated and enterprising way.

II. **Employer and profession focused education** – the ECB had to support a close partnership between the Faculty, employers and professional bodies to develop appropriate curricula and learning environments through inputs from practising professionals, student placements, sponsorship, part-time study, projects, case studies and visits and ultimately leading to employment opportunities.

III. **Activity Led Learning** – the building is central to promoting Activity Led Learning, a teaching initiative which the University sees as the way forward for 21st century graduates. This new method of educating students is designed to give them real life industrial problem-solving challenges against deadlines, motivating their learning through activities and equipping them with the skills and experience employers are looking for.

From the outset, the building was intended to be part of the learning experience for students as Gerry Ackerman, the former Deputy Director of Estates and Property, explains:

> "The building is part of the learning experience. All the services are exposed and the main plant room has a high-level gangway that enables students to look down on the biomass and gas boilers and other equipment. Students can also access plant on the roof, while a video wall at reception displays information from the BMS that helps people understand how the building works."

The building planning team travelled extensively throughout the UK and to places such as Australia, Denmark, USA and Canada, looking at the best in architectural design, and a variety of different learning environments. The team also wanted an educational building which drew inspiration from other sectors and industries, including hotels and banks.

Key features of the new building

The new building comprises some 15,000 square metres of gross internal floor and accommodates 4,000 students. The space provides:

- A high-performance engineering centre with flight simulators and engine test cells
- A high-precision Mercedes Petronus wind tunnel testing facility
- Haas CNC Machining Centre
- Metrology laboratories
- Composites laboratory
- Three lecture theatres: one seating 234 and two seating 142 and 108 respectively, which can be conjoined to create a 'theatre in the round'
- Collaborative classrooms, including IT workspaces
- Fully IT enabled communal interactive spaces with learning booths
- Shared academic offices, driving new research and teaching
- A large, flexible open space for events, displays, business facing functions etc.
- Outside patio terraces
- A High Performance Computer
- One of the largest environmental chambers in the UK
- An ERDF-sponsored centre to support SMEs around the UK with the development of sustainable construction technologies.

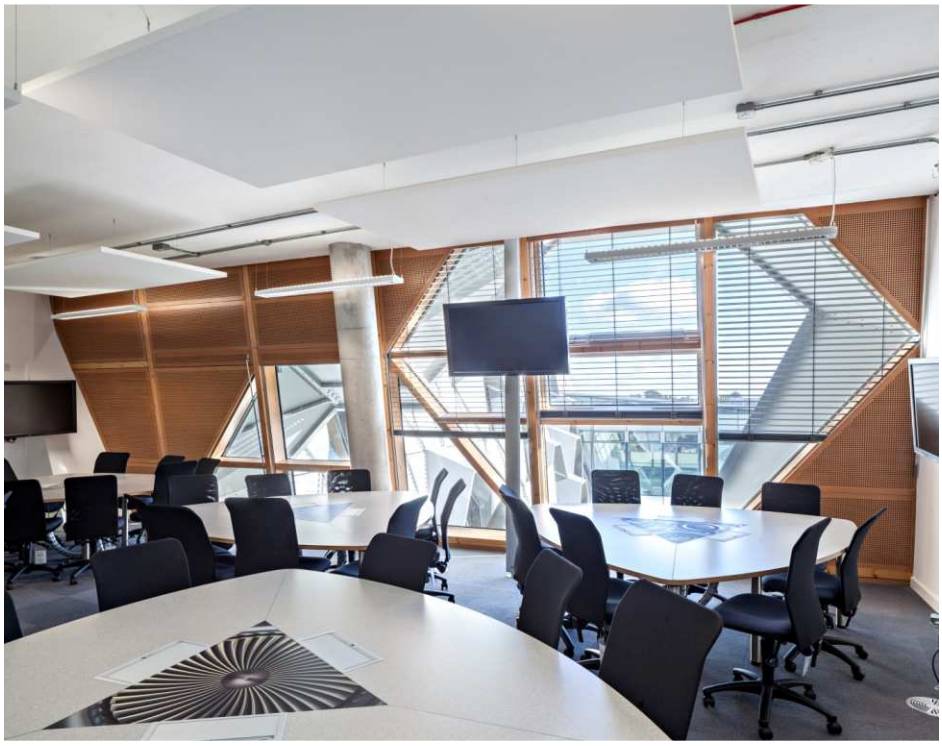
Flexibility in use

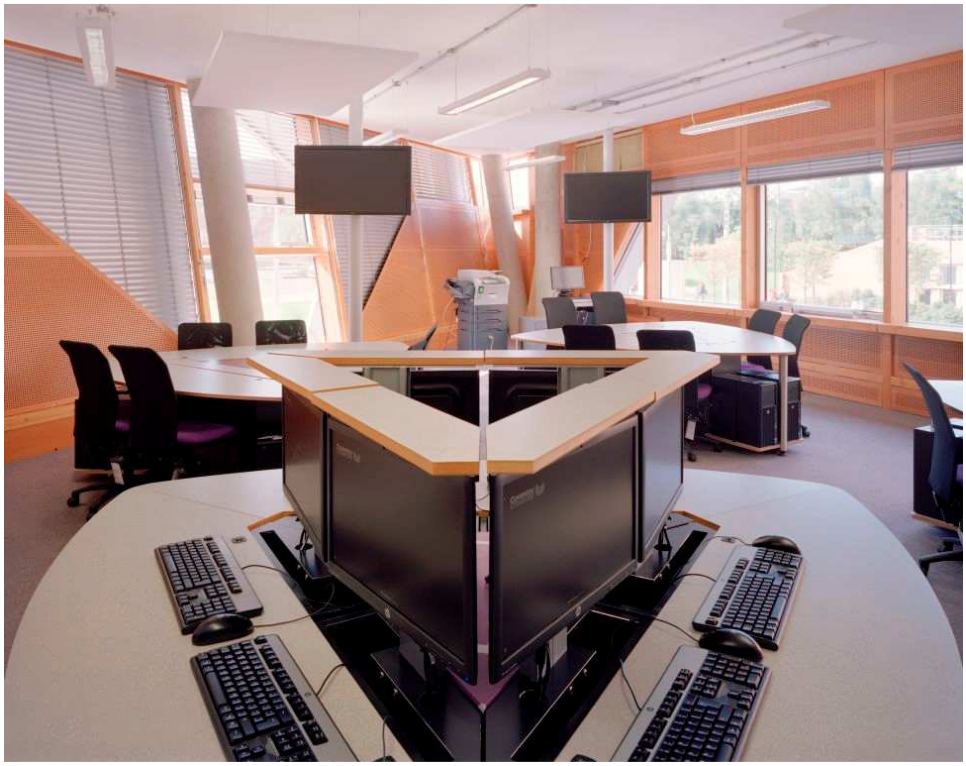
The lower ground floor consists of a large open area housing the Faculty's High Performance Engineering Centre and a high proportion of the Faculty's specialist equipment. This arrangement both enhances and facilitates interaction among a range of different disciplines (for example between Mechanical, Aerospace, Manufacturing and Automotive Engineering). The design of the space allows specialist equipment and associated facilities to be moved around and new requirements accommodated without the constraints of walls, fixed room sizes and services.

General teaching rooms are designed to support different delivery styles and activities and offer a degree of flexibility. The rooms do not have a traditional, linear 'front-facing' design, but are instead laid out as an integrated space with shaped tables accommodating groups of either six or nine.

Around the perimeter of the rooms are a range of LED screens which can project images around the room or can be 'owned' by a particular table. This design allows far greater opportunity for engagement and interaction between occupants. The tables are fully IT enabled with data and power provision. In the nine seat style this provision facilitates use of mobile technology if required, while in the six seat style tables are provided with hard wired IT equipment as a standard feature.

The design of the table, with full electronic retractable monitors, allows flexibility while a session is in use because tables can either be in IT mode or with the monitors in the down position, becoming standard flat table top. This configuration also delivers far greater flexibility in room use, thereby enabling much higher room utilisation figures to be achieved than had previously been the case.





The building also has a space of around 1,000 square metres that is flexible and able to be easily re-profiled and re-configured for a variety of different teaching, research and business facing functions. This feature has enabled the Faculty to expand a number of existing activities as well as develop a number of new initiatives. The space quickly established itself both within the Faculty and also the across wider University as a destination of choice and would now be regarded by the University as an essential feature in any future similar project.

Year round use

The design of the building has delivered greater efficiency and improved space utilisation compared with the Faculty's previous facilities.

The building is well used not only during the core semester weeks, but throughout the year. Because the University has student intakes in January as well as September, teaching takes place year round. Over the summer, the building is the base for a substantial programme of STEM master classes and outreach activity with local schools and partners. It provides an excellent environment for CPD events and for a variety of interactions with SMEs. The building is also in demand across the University for hosting conferences and other activities.

In the first year of operation, to enhance student experience, a pilot project was carried out to extend the opening times of the building, keeping it open 24/7 for a six week period before exams. The success of the pilot led to the building regularly operating extended opening hours at weekends between January and June each year and for a six week period prior to final coursework and project submissions and exams operating on a 24/7 basis.

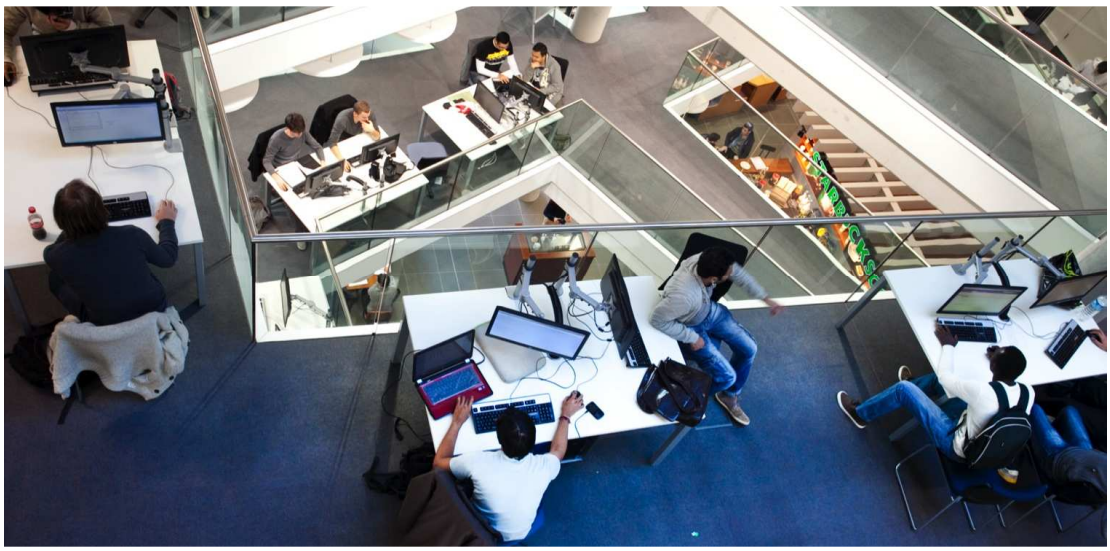
Staff accommodation

Before they moved into the new building, staff were located in a variety of office types, with many in single offices. A new approach to staff workspaces was taken focused on increasing staff interactions, making different functional spaces available to staff that they would move through during their working day and ensuring a consistency of provision for all.

This approach was articulated with new language to describe these functional spaces: personal; private; and conversation space. In the ECB, staff share office spaces that accommodate either three or four people. Within each office they are allocated a personal workspace (desk, PC, storage). Private spaces are available either to book or use on an ad-hoc basis if staff need to have some 'quiet space' or confidentiality for conversations and meetings. Conversation space sits around these two types of space. Filled with a range of soft seating, conversation space provides a space for people to converse and interact. The Faculty also offers flexible working arrangements through its Location Independent Working scheme. Staff on the scheme are supplied with mobile technology and lockers, making use of dedicated hot-desk and touch down spaces.

Student feedback

The ECB has been well received by students and has a 'pull' factor in attracting large numbers to open days. In the two years that the ECB has been in operation the number of students attending Applicant Experience Open Days has increased significantly. Pre-Applicant Open Day attendees rose from 743 in 2011 to 945 in 2013, while Post Applicant Open Day attendees rose from 607 in 2012 to 1,436 in 2014.



A quote from The Student Room, A day in the Student Life says,

> *"I get in at 9am and when I am in for a lecture I tend to head straight to it," says Matt. "However when meeting for group work or doing individual work I relax a bit first, normally via Starbucks!*
> *Everything around the building feels fresh out of the wrapping - and everywhere you look there are examples of clever design.*
> *Of the two main lecture halls, one is an amphitheatre-style room with the lecturer's space in the middle of a 360-degree seating arrangement. Today, a smaller group is in for Matt's first lecture, so a dividing wall is dragged across to cut the space in half."*

The University has found that both student and staff satisfaction levels have increased, with the building cited as a direct influence on this.

But one of the most significant outcomes of the building is the willingness of students to engage. Reception areas are staffed by students and are open between 8.30 am and 8.30 pm. More than 75 student advocates support a variety of events, conferences and workshops across the Faculty. The ability for students and staff to work alongside each other is a positive experience for all, leading to a greater understanding and empathy between them as well as enhancing students' employability skills by offering the chance to develop a range of soft professional skills. The Faculty reports that students feel empowered to 'own' space, and suggest changes to the building and its facilities.

Using the building to develop student employability

Since the launch of the ECB, the number of students completing 12 month accredited industrial placements has increased by over 130 per cent within two years. In 2013-14, 209 students from the Faculty completed accredited placements at 128 different technical employers and the numbers are increasing again for this year. The facilities available within the ECB allow EC Futures, the Faculty's dedicated employability unit, to host larger scale events, host employers and facilitate more student interaction with industry. The flexible exhibition space enables the Faculty to run large scale Engineering and Computing Careers Fairs that are free for employers, allowing it to attract a large and diverse pool of employers that would not otherwise target Coventry University.

Over 1,500 students attended employer presentations in the first semester of 2013-14 within the ECB. The Faculty has received a significant number of positive testimonials from employers about engagement with the Faculty's EC Futures team based in the ECB. The building contributes to their success and enabled them to be short listed for the 'Best Placement Service in the UK' Award at the National Undergraduate Employability Awards for both 2014 and 2015 and Win the Coventry University Teaching Excellence Award 2014 (Employability).

Business engagement

The ECB makes a significant change to the way the Faculty recruits and engages with businesses as part of its marketing strategy, enabling it to host a greater number and wider variety of events with a larger and more varied client base. It regularly hosts a variety of business engagement events including conferences, exhibitions, workshops and presentations, CPD events etc. Feedback on these is very positive. For example, the Manufacturing Technology Centre said: "The Engineering and Computing Building is an inspirational space that will help facilitate the development of future engineers." The building was also the inspiration for a new University collaboration with Unipart Manufacturing Group.

Environmental sustainability

The £55m project delivered a highly sustainable building that uses a range of technologies including rainwater harvesting, solar thermal energy and a biomass boilers.

The biomass boiler supports the majority of the heat and hot water demand of the building with gas boilers just providing backup. The biomass boiler fuel is wood pellets which are sourced sustainably from UK suppliers. Heat recovery systems feature strongly in the design ensuring heat generated from IT server rooms is used to pre-heat hot water. A small solar thermal PV installation on the roof also provides pre-heating to the hot water as well as being a valuable research tool for academics

and students alike. Surface water is collected from the roofs and surrounding paving to provide toilet and urinal flushing water.

The building is naturally ventilated during the summer months using automatic windows and a night-time cooling system. This reduces the need to cool areas through the warmer parts of the year.

Natural daylight features strongly throughout the building with glass partitioning and light wells designed to maximise the benefit from daylight hours and reduce the need for fluorescent lighting. The fittings in much of the general circulation areas are daylight linked. Solar shading maximises daylight in the winter months whilst reducing solar glare during the summer.

The building features a green roof, which mitigates flash flooding caused by periods of heavy rainfall and also supports biodiversity on campus. Preserving and encouraging bat habitats has also been incorporated through bat roosting areas in the façade and trees selected specifically to help bats in moving around the building. Wood used in the construction of the building is FSC certified and over 70 per cent of the raised access floor tiles were reclaimed from other building projects in the UK.

3. Imperial West – Imperial College's Campus in White City

Imperial College is developing a new campus, Imperial West, in White City, West London. Imperial West will provide the College with the capacity and opportunity for further growth and development which would not otherwise be feasible given the development constraints on the South Kensington Campus.

It is a key strategic aim for Imperial to translate its research into commercial application, and the new campus will include a Research and Translation Hub to deliver a multi-disciplinary research space for the College's scientists and engineers, and facilities for translating research into direct applications and spin-out companies. In the longer term, the site will also provide conference, residential and leisure facilities in an area where regeneration has been a longstanding objective.

Key features of this case study include:

- Providing the environment for levering value from academic endeavour
- Significant expansion of the facilities available to the College to undertake world leading research and education
- Meeting the needs of London's growing enterprise community
- Emphasis on linking research and commerce
- Flexible buildings procured on a rigorous commercial basis
- Delivering value from investment by optimising site capacity and land uses
- Imperial to take an anchor role in supporting regeneration in White City.

Imperial's estates plan

Imperial College's activities are based on a number of sites in London. The principal academic campus in South Kensington and comprises approximately 12 acres of land.

Imperial West is a key part of the College's strategy for the further development and use of its estate. The initial decision to develop the campus was taken for three main reasons:

I. to provide additional space given the College's existing constraints
II. to extend and develop the College's success in translation and commercialisation
III. to take the opportunity presented in London to be a world-leading higher education institution in its relation to business and contribution to economic growth.

The new campus in White City is three miles away from the South Kensington Campus and near to the College's Hammersmith Campus. It is located in an area of West London where regeneration has been a key objective for over 20 years to assist in reducing concentrations of deprivation, reduce social and economic polarisation and encourage social mobility.

The College has a dynamic Master Plan to provide a coordinated framework for the development of its estate and built assets. This informs the College's longer term capital expenditure plans.
The Master Plan covers all areas of the College's estate, including exploring and assessing existing space and facilities at South Kensington, and understanding how improvements can be made to the College's facilities and the environment in which staff and students study and work.

The Master Planning programme includes considering how the College can make best use of the newly acquired site to further Imperial's mission in respect of education and, in particular, research and translation. The Master Plan will provide an integrated strategy for the whole of the College's estate, including its clinical sites, which will maintain and develop a world-class environment for the academic community.

The vision for Imperial West

The Imperial West vision expands on the success of the main campus in South Kensington and will create an open access academic campus that will provide the physical infrastructure for teaching, research, translation, commercialisation and collaborative activities. The campus will co-locate world class researchers, businesses and higher education partners to create value on a local, national and global scale.

A key element and early stage of the development of the campus is the Research and Translation Hub which will provide a high specification, multidisciplinary research and incubator space for researchers to collaborate. This collaboration will both generate new businesses and enable existing small businesses to scale more rapidly. This approach will have a direct impact on economic growth and provide jobs and economic stimulus in one of the poorest localised urban areas in London and the UK.

To date, Imperial has produced more spin-out businesses than any other UK university, 140 over the last ten years, but has been able to accommodate only 10-15 at any one time within the limited space available in its South Kensington Campus Incubator. The new Research and Translation Hub will provide facilities for many more spin outs, and support the flexible growth demands of the existing spin out community so that the College can support companies from inception through to maturity.

The Imperial West development complements the College's existing activities in the West London area. It is located 500 metres from the Imperial Centre for Translational and Experimental Medicine (ICTEM). This £66million facility was opened in May 2012 next to Hammersmith Hospital. It combines laboratory space for up to 450 scientists with a dedicated facility for evaluating and developing new medical treatments through clinical trials.

Imperial West, combined with the College's adjacent campus at Hammersmith Hospital, will become the cornerstones of a major new research quarter for London, reinforcing the city's position as a catalyst for scientific development and economic growth.

Progress to date

In 2009 Imperial acquired the freehold of the seven acre 'Woodlands' site in White City from the BBC. In the following year, planning permission was obtained for 25,000 square metres of development, and within two years, Wood Lane Studios were completed. The Wood Lane Studios development is made up of 600 studios for postgraduate students and nine College key worker residential apartments to support early-career researchers in an area where affordable accommodation is hard to find.

The next phase entailed securing permission for a further 100,000 square metres of development with the Research and Translation Hub accounting for around half of this.
Implementation of the Hub depended on obtaining development funding. In 2012, the Higher Education Funding Council for England provided a grant funding commitment of £35million through the UK Research Partnership Investment Fund. The grant was contingent on the overall funding being on a ratio of at least 2:1 private to public funding. The balance of the funding for the £150million project is being provided by the College and through a £90million contribution from investor Voreda which was secured via a development and investment facility from Santander Corporate Banking.

Since the original land acquisition in 2009, the site for Imperial West has expanded. In 2013, it increased to 22.75 acres through the acquisition of land south of the Westway, one of the main arterial routes into central London from the west. In total, the enlarged site could have the potential to increase the capacity of Imperial West from 125,000 square metres to over 450,000 square, not only delivering the prospect of a major second campus for Imperial but also enabling College partners to co-locate and the aspirations set out in the White City Opportunity Area Planning Framework to be delivered on a realistic timescale.

The Research and Translation Hub

Due to open in 2016, the Research and Translation Hub will provide flexible multi-disciplinary research space with adjoining translational and commercialisation facilities with space for co-location of other institutions and businesses. The Hub will create space for at least 1,000 scientists and engineers.

The Hub comprises 48,000 square metres of space in two buildings:

1. One building is the Research Centre (25,000 square metres). This is a core College building which will include primarily research facilities and some postgraduate teaching accommodation.

2. The second building is the Translation Centre (23,000 square metres). It consists of incubator laboratories and offices, 'grow on' space and commercial office accommodation. It can facilitate up to 50 new incubator units for university and industry spinouts and new ventures. The College believes it will offer the largest concentration of affordable, flexible laboratory and office space (with specialised commercialisation services) in central London. The incubator space will accommodate each stage of a company's growth, from its early stages through to maturity, providing scalable next-generation facilities.

To facilitate collaboration across disciplines and to create an environment suited to discovery, the Hub has been designed to support flexible and adaptable working spaces.

The Hub will initially focus on the development of opportunities around Chemistry as a fundamental discipline. This is has the potential to expand to include Synthetic Biology, Plastic Electronic Materials and Devices, BioMaterials and Translational Molecular Research.

Imperial College currently carries out world-class research in these disciplines and is engaged in collaborative work with strategic partners. By bringing together these rapidly developing areas of research in one location with Chemistry research at its core, the College will encourage strong external relationships and partnerships to develop.

Linking research and commerce

The Research and Translation Hub will have flexible, adaptable space in which the potentially changing future focus of discovery and translational work can be accommodated. Competition for location of research activities at Imperial West will be decided on the following criteria:

- The organisations are innovative and are curiosity driven
- They are either world-leading and internationally recognised, or are establishing potential new and disruptive approaches that could materially change understanding and markets
- They are operating in areas that have strong potential for further development and commercialisation
- They operate across the College's core disciplines to promote novel relationships to develop between the public/private divide.

To optimise success, a financial model has been developed based on a residual rent level, payable by Imperial as head lessee, calculated prior to the start on site when all costs have been tendered. This maximises the Imperial covenant, based on the lowest possible rent, which will allow flexibility in subsequent sublettings. The gives the College the scope to select tenants along a 'curve of

indifference' between academic alignment and commercial return. It is hoped that this will allow an effective 'curation' of the tenants rather than a simplistic rent based first come first served model.

Optimising site and building efficiency

Working with their partners Voreda, Laing O'Rourke and Santander, Imperial secured the project on a rigorous commercial basis from the outset designed to deliver buildings on time and in budget, recognising that the focus needed to be on an efficient and flexible Shell and Core given that over 40 years there is no operational certainty about the specific use of the structure.

Planning permission was obtained for the first phase of development comprising 25,000 square metres in a 13 week period (the minimum), and works started on site as soon as permission was granted. The second phase of 100,000 square metres was granted permission within seven months, with a balance between detailed consent for the Research and Translation Hub and the Residential Tower and outline on the remaining structures planned for the site.

The building design for the Translation Hub has been subject to design optimisation reviews to improve the quality of the internal accommodation and the overall efficiency of the building including increases in the internal area. This has resulted in a net to gross ratio of 75:100 within the total of some 23,000 square metres – an efficient ratio for a higher education building including specialist laboratory space given the challenges of central London planning.

A design review on the Research Hub was carried out to assess the flexibility of the building to accommodate maximal alternative uses and in particular to enable the conversion of offices/teaching space to both wet and dry laboratory uses to meet future College demand. While this increased cost and impacted on net efficiency, it provides a far more flexible building in the longer term. The College therefore elected to prioritise optionality over cost in the short term.

The Hub project is being delivered as a single project in the joint venture between Imperial and Voreda. On its completion, the undeveloped parts of the Imperial West will be in a state ready for the construction of the next phases.

Regeneration and the community

Imperial West is located in an area where regeneration of the local economy is a longstanding objective.

The site is located in the centre of the Greater London Authority's 1,000,000 square metre White City Opportunity Area, one of London's major brownfield areas with capacity for redevelopment. The Local Council (the London Borough of Hammersmith and Fulham) wants to attract new homes and jobs with a focus on education, research and the creative industries. The site has excellent potential for both public and private sector development. Plans for the campus include homes, publicly accessible green space, leisure and retail facilities. On completion, the north part of the campus is designed to provide over 3,200 permanent jobs.

Obligations under the Section 106 Agreement attached to the permission for development and contributions to the Mayoral Construction Infrastructure Levy will deliver supporting infrastructure to the benefit of the development and the community including health and education facilities, public open space and employment and training.

1. Loughborough University – new uses for a historic building

This case study centres on the conversion of a historic building from its original use as a student hall of residence into flexible shared offices for the Vice Chancellor and Professional Services.

Key points

- Efficient and effective re-use of a historic building in a conservation area which was no longer fit for purpose for its original use as student accommodation
- Key enabling role in delivering the master plan for co-location of departments
- Delivering space efficiencies in office use as well as providing an improved internal working environment for staff
- Creation of open plan working for the Vice Chancellor's Office: the senior team of four are leading by example in adopting new office working practices
- Implementation supported by a clear Space Policy
- Contributing to the carbon reduction policy
- Retaining historic features of building whilst providing very modern open plan offices.

Context

The University has implemented a £25million master plan for the Central Park area of the campus. This resulted in the co-location of academic departments in single buildings or adjacent buildings both to support academic aims and improve the student experience. Co-location of academic activity could not be achieved, however, without freeing up space occupied by administration and support activities which were dispersed across the Central Park area.

The use of the Hazlerigg and Rutland Buildings to accommodate Professional Services departments provided the key to enabling Professional Services to move out of the Central Park. The reconfiguration of the space also delivered the opportunity to deliver integrated administration teams and created an HQ and focal point for the University.

It was important to the University to retain Hazlerigg. It is the oldest building on campus and a cornerstone of the surrounding conservation area. The building has a total gross internal area of some 3,400 square metres. It was constructed in 1937 as a hall of residence, but it became obsolescent. It could not accommodate the specifications needed for modern student residential accommodation.

Project objectives

The project to convert the Hazlerigg Building as a first phase and Rutland Building as a second phase into offices was designed to meet a range of objectives:

- Not only is Hazlerigg Building is one of the oldest on campus, it is also well-regarded by current and former students. The University wanted to retain its character and the heritage feel of the interior, while at the same time creating a modern, open plan office environment for 140 staff moving from cellular offices.

- It was a core project objective to support new ways of working. The Professional Services teams had been based in a range of buildings across the Central Park with a high percentage of cellular offices. Co-location was aimed at improving working practices within and between teams to create a more efficient, effective and flexible administration combined with the technologies to assist this. There was also a desire to improve communication and improve effectiveness.

- From the outset, the Hazlerigg Project was intended to be an exemplar for further future moves of Professional Services in the next phases of the implementation of the master plan. The VC and senior management team were also leading by example in moving into open plan offices in the reconfigured building.

- It was also an objective to deliver space efficiencies through the layout of accommodation and increased use of shared facilities, such as printing capabilities.

- Delivering space efficiencies was linked to the objective of contributing to the University's carbon reduction targets by avoiding the need to construct the additional space that would otherwise have been required to accommodate the co-location of academic departments and the expansion of the library.

Meeting the challenges

It was a challenge for the project to retain the heritage and character of the building, while at the same time creating a modern office environment. Oak panelling and stained glass windows were removed during works and when the bedroom areas were knocked through to create open plan offices.

The original furniture was re-used in the Council Chamber and lounge areas.

The move to shared and open plan offices from largely cellular accommodation was a major change for many staff.

Meetings were held over the nine months before the move with team leaders and staff to understand how they worked, the benefits they could anticipate from the move and their concerns about the changes, and how shared facilities would be used, such as kitchens, printers and meeting rooms.

Creating open plan working for the Vice Chancellor's senior team showed leadership in new working practices and office arrangements. The project was endorsed from the outset by the Vice Chancellor and the senior management team who asked the Director of Change Projects to work alongside the Project Manager for the building.

Facilities for meetings and the heritage rooms within the building are shared not only between occupants of Hazlerigg, but can be booked by people across the University. They are used for local community events and meetings, and available for staff to work quietly when they need to.

The University's Space Policy

Loughborough University has a Space Policy, which supports the implementation of projects such as the reconfiguration of the Hazlerigg Building.

Policy aims

The aims of the space policy are:

- To provide the optimum amount of flexible space to support the University's overall strategy. Space should be functionally suitable for its purpose, in excellent condition, and utilised as efficiently as possible.
- To reduce the costs of both provision and maintenance of the built estate and reduce carbon emissions.
- To support the effective implementation of the University strategy.

Policy principles for space allocation

Guiding principles for decision making on space allocation include:

- Increase space utilisation and functional suitability across the University leading to potential decommissioning of legacy, poor carbon performing and unattractive buildings.
- Eliminate 'entitlement' and ensure allocation is based on need.
- Encourage sharing of space and collaboration across Schools and Professional Services.
- Plan for and encourage alternative methods of working to include open plan and hot-desking.

Policy principles for office use

The policy sets out principles for different types of space. The principles for office use are:

- The use of dedicated open-plan areas for all staff will be encouraged together with hot-desking provision. There is no automatic right to occupy an individual office unless a need is demonstrated.
- Rooms that are suitable for offices should not be used for storage, to locate printers/photocopiers etc.
- When Academic Schools and Professional Services appoint additional staff, accommodation must first be found by ensuring that all offices with an area >13 square metres have an occupancy of at least two persons.
- Visiting staff should normally be located in shared offices or have hot-desk provision.
- PhD students should normally share office accommodation or use open plan spaces or hot desk.
- Professional Services staff should normally be located in shared offices or use open-plan spaces.
- Alternative accommodation for light users of workstations will be provided by using shared desk space or providing touchdown points for laptops.

Value, cost and programme

The University undertook its own design for the conversion and contracted with a company specialised in interior design. By using a very experienced project manager who undertook the

design, worked with contractor and occupants, the University achieved value financially and in terms of functional suitability by staying close to all stakeholders.

The cost per square metre was £1,585 which compared favourably with other local heritage refurbishment projects and offered a significant cost saving compared with the construction of new buildings.

Sustainability

As well as complying with the Space Policy, the project also needed to accord with the University's Sustainability Strategy.

Technical solutions were designed to contribute to this. An Energy Centre was located in the basement, and services were installed so that they could also be used by the neighbouring building which was also being refurbished. Hazlerigg is connected to the campus district heating system which incorporates a combined heat and power plant enabling the project to benefit from this low carbon technology. Natural ventilation was adopted as the default system wherever possible to reduce energy consumption and maintenance requirements and improve the feeling of wellbeing for occupants.

Occupants of the building won the Gold Award in the University's Green Impact Award in 2012, where teams across the University compete for recognition of changing behaviours in order to reduce carbon emissions.

2. Manchester Metropolitan University - delivering the strategy

Manchester Metropolitan University (MMU) is the one of the largest campus based undergraduate universities in the UK with a student population of over 30,000. Over the past ten years, MMU has implemented a major estate rationalisation and renewal strategy. Implementation of the strategy has transformed the estate and improved the delivery of academic teaching and research activity. It has seen the University reduce the number of campuses from seven to two resulting in a high quality, consolidated and sustainable estate.

Key points

Key points from this case study are:

- Clear and longstanding strategy for campus rationalisation
- Strong leadership and commitment: consistency of purpose
- Delivery of new high quality sustainable buildings to replace older dispersed facilities
- Positive impact on the student experience
- Positive impact on the locality and benefits for the community
- Space and cost efficiencies.

Financed entirely from MMU's existing resources, the delivery of the estate strategy represents one of the largest and most ambitious investment programmes of any UK university, and provides MMU with two high quality university campuses, in central Manchester and Crewe, Cheshire. The £350million investment in realising the strategy represents a long-term strategic commitment to the development of MMU as a vocational and research-informed university in the North West region.

The Strategy

The initial plan for estate consolidation took shape in 2004. At that time, the University was dispersed across five campuses in central and south Manchester: All Saints, Aytoun, Elizabeth Gaskell, Hollings and Didsbury. There were also two campuses at Crewe and Alsager nearly 40 miles away from central Manchester.

The original vision centred on uniting the seven Manchester faculties, located across central and south Manchester, into a single city centre campus. The decision was also taken to consolidate the two Cheshire campuses by retaining and developing Crewe as the base for MMU Cheshire and vacating and disposing of Alsager.

Drivers for campus rationalisation

There were multiple drivers behind the decision to rationalise the estate, principally:

- An urgent need to modernise the learning and teaching environments for staff and students, raising aspirations and ambitions of both groups
- Providing world-class facilities for teaching and research to attract high quality staff and students from UK and international markets
- Increasing competition for students and research at all levels regionally, nationally and internationally

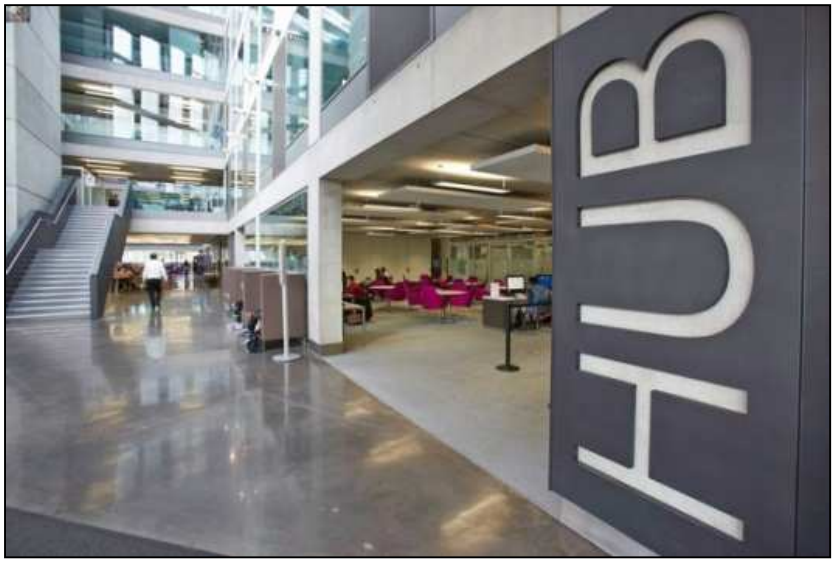
- Raising of students fees in 2003 and again following the Browne Report in 2012 – the changing relationship between students and universities
- Leveraging economies of scale and institution-wide benefits from having two campuses to focus teaching, research, services and support
- Removing duplication of services (for example reducing the number of libraries from seven to two and the number of catering outlets from 14 to five)
- Improving overall efficiency in the size of the estate
- Improving the quality of the estate and environmental sustainability.

The new estate

The strategy has delivered major change. On the All Saints Campus in central Manchester, it has generated the following projects.

The Business School and Student Hub

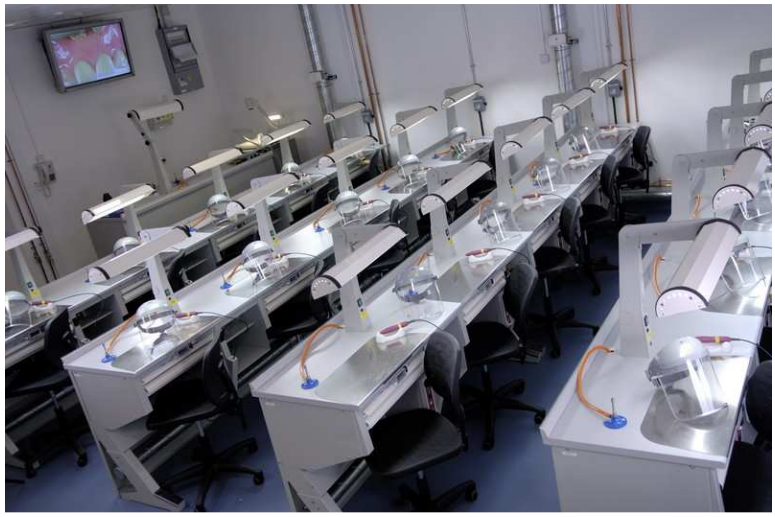
The Business School was based at the Aytoun Campus which was made up of a range of buildings some with poor fitness for purpose and condition. Aytoun was closed in 2012, and a new 25,000 square metre Business School opened on the All Saints Campus at a cost of some £75million.



The new building provides a range of high specification learning environments and student support services, winning multiple awards for design. It won the Prime Minister's Award for Better Public Buildings in 2013, the Concrete Society Sustainability Award in 2012 and was the BIS Cabinet Office, Design Council and CABE National Winner 2013

John Dalton Tower

Investment of £56million in the Science and Engineering Complex delivered high specification teaching laboratories and research facilities including blood biochemistry, biomechanics, motor control, exercise performance laboratories, a multimedia research laboratory and a computer games usability laboratory.



External works included recladding of the existing 1960s exterior, the installation of a new roof and the incorporation of a goods lift/ancillary area into the existing fabric.

Benzie Building

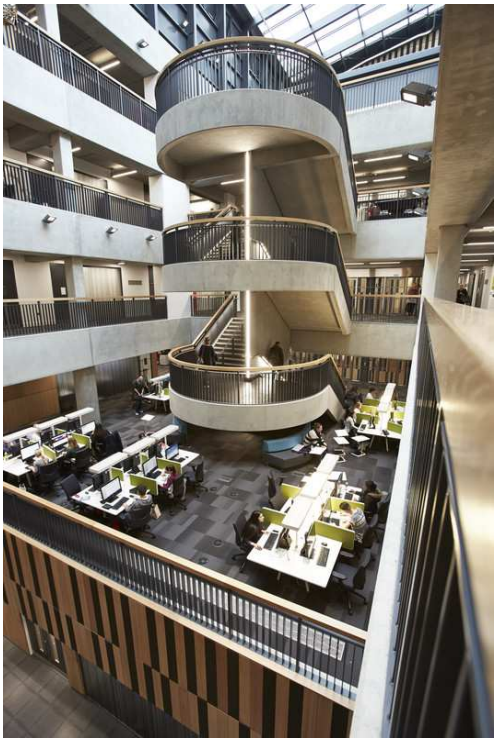
The new School of Art Building called the Benzie Building provides classrooms, workshops and hybrid studios with multifunctional spaces and galleries. The £35million project delivers high quality facilities for students of the School of Art.

The project has enabled the Hollings Campus in Fallowfield to be vacated and sold. The Hollings Campus was characterised by 1960s buildings which were no longer fit for purpose and could not readily be adapted to changing academic needs. Following the relocation, Hollings students and staff have access to the University's city centre facilities and work alongside students in the School of Art in shared facilities in the new building (one of six buildings across the UK shortlisted for the RIBA Stirling Prize award in 2014).

Birley Fields

Historically the Faculty of Health, Psychology and Social Care was based on the Elizabeth Gaskell Campus, and the Faculty of Education was located in Didsbury. Utilisation was low in both locations, and the campuses were in need of major modernisation and investment.

The new Birley Fields site (a £140million project) opened for the 2014-15 academic year and provides facilities shared by 6,000 students in the two Faculties. Alongside the 25,000 square metre academic building there is student accommodation for up to 1,200 students provided in environmentally sustainable townhouses and traditional student apartments, all located within the 15-acre site and within easy walking distance from the buildings located at All Saints.



MMU Cheshire

The two campuses in Cheshire were consolidated in a single location. The Alsager Campus closed and its activities were transferred to the upgraded and expanded campus in Crewe through a £30million investment.

There is a new Exercise and Sport Science Centre at Crewe to replace and enhance the Alsager facilities. This includes laboratories, altitude training chamber, sports hall, and data analysis suite and sport injury clinic.

There is also a Contemporary Arts Centre with dance/theatre studios, specialist recording and post production music studios, concert performance space and a music technology suite.

Strong leadership and commitment – consistency of purpose

This scale of change across the estate required strong leadership throughout strategy development and implementation. The principles of the strategy were initially developed by Dame Sandra Burslem, Vice-Chancellor of MMU until 2005 and ultimately led and directed by Professor John Brooks, the University's Vice-Chancellor since 2005.

Initial thinking was discussed and shared at a university-wide series of meetings chaired by the Vice-Chancellor. Working with colleagues from across MMU, the overall master plan was developed into a clear strategy, action plan and prioritisation of the capital works needed. There was also collective buy-in from across the University, which was essential given the significant lead times and proposed duration of the implementation period - in excess of eight years.

Strategy leadership

- A strategy of this scale and duration needed long term support and buy-in from the entire organisation, starting at the top with the Vice-Chancellor and the Finance Director, along with the senior managers of MMU.
- It also included the Board of Governors, who were instrumental in supporting the vision from the beginning, approving key financial and project milestones that enabled the University to commit to this long term strategy.
- From a master planning perspective, it needed strong and clear architectural principles and inspiration. A business school is by its nature quite different from an art school, as is a health faculty from a humanities faculty. Allowing each to flourish in design terms (as all faculties were able to) within an overall design and architectural framework, was critical to the delivery of each project and its success.

The University works very closely with the city and county councils, and knowing that the University had strong working relationships with, and the backing of, both councils, enabled it to commit to the vision.

Faculty leadership

- In effect, the input at a faculty level mirrored the structure and buy-in at University-level – the process required major input from Deans, academic staff and faculty staff.
- In the faculties that were moved and/or redeveloped, each Dean had to provide strong and consistent leadership and commitment, leading by example with input and awareness of the many micro-issues and details that would inform a new faculty campus building.
- This gave rise to better design and architectural solutions to very specific issues raised by academic and technical colleagues. The quality and substance of this debate was pivotal to delivering very high quality, academic environments designed to stand the test of time.
- It also enabled several faculties to test their thinking around changing work practices and established protocols that primarily existed because of the older environments.
- Many of the departments wanted to modernise their teaching and learning approach, and to use this opportunity to examine the pedagogy and learning outcomes. In parallel the University developed a major review of the teaching module structure to support the advancement of fewer but more focused modules in each academic programme.

Financial leadership

- From a finance perspective, it was about applying strong financial management to ensure financial sustainability, so that the University could provide long-term surpluses that would underpin the commitment to the programme.
- It was also about seeking and gaining buy-in from senior colleagues and their teams about the short-term pain (limited investment in acknowledged poor estates and infrastructure) that would be necessary pending completion of the long-term vision.

Governance and project delivery – the example of Birley Fields

The requirement for a strategic development framework for the extensive Birley Fields development led to the development of a project board structure chaired by the Deputy Chief Executive of Manchester City Council and the University's Vice-Chancellor. The board included key external stakeholder representation from organisations such as:

- HEFCE
- Manchester City Council
- South Manchester Regeneration Team
- Central Manchester University Hospital NHS Trust
- City South Manchester Housing Trust.

Moving forward the next phase of the master plan will also adopt a similar project board structure.

The Birley Fields development was also the first capital project at MMU to adopt the Building Services Research and Information Systems Association's (BSRIA's) 'Soft Landings' framework. The key aim was to minimise the likelihood of a performance gap between the design intention as interpreted by the design team and the operational expectations of the client. Throughout the process, key stakeholders were included in the design and commissioning of the project to ensure they were knowledgeable about the building and its facilities before the building hand over.

The soft landings approach is generally regarded as a success by the University. The formal monthly (House) and subsequently fortnightly (Home) review meetings maintained project discipline during the final 12-months of the construction process through to handover. In addition, two key individuals from the contractor M&E delivery team led the aftercare team and were integral to minimising building defects pre and post-handover.

In terms of the actual soft landings procured by MMU:

- 100 days of extra support
- Pre-handover – 10 days
- Initial aftercare – 70 days (July 2014 – March 2015)
- Extended aftercare – 20 days (March 2015 – December 2017).

Due to programme constraints, the main contractor, Sir Robert McAlpine, was assigned responsibility for the installation of FF&E and IT/AV as well as the relocation of staff/materials and the disposal of legacy equipment. This approach ensured that all stakeholders, particularly the main contractor, were focused on the practicalities of delivering an operational building rather than the building works only. Consequently, the contractors appointed a specific Turnkey/Relocation manager to work alongside the MMU Facility Manager and attend decant related meetings with the relevant stakeholders.

Impact of the strategy

The impact of the implementation of the strategy is wide ranging in terms of delivering efficiency, environmental sustainability, building quality, the student and staff experience, and community engagement.

I. Delivering efficiency

It was a goal of the strategy from the outset to reduce duplication, increase efficiencies in the use of the estate and support environmental sustainability.

The strategy was developed by working with each of the University's eight faculties to forecast student number projections over a five year period and to forecast income for teaching, research and third stream activities.

The amount of space to be provided for each faculty was estimated on the basis of theoretical space requirements. These assumed efficiencies in space use including reductions in the area of office space to a range of seven to 11 square metres per full time equivalent member of staff from an average of 13.5 square metres per member of staff based in offices in 2008-09. Timetabling was centralised, and it was assumed that the University would increase its space utilisation rate to a 60 per cent frequency of use rate between 09:00 and 18:00 and a 60 per cent occupancy rate when rooms were in use.

From a space planning viewpoint, the University focused on future proofing the new buildings as far as possible to allow for new academic and business areas to develop, and the demands from industry, society and government to grow. As an example, more than 30 per cent of courses now taught by MMU did not exist as careers in the mid-1990s. Developing teaching and learning spaces which can adjust to industry and global changes was a key part of the planning and development of the new buildings.

For financial planning, there was the need to demonstrate real value for money in all aspects of the buildings projects. Architects and projects managers were tasked with creating buildings that were fit for purpose, but also of world-class standards, commensurate with the best modern university buildings around the world and sustainable with stretching long-term energy, carbon and waste targets. The build costs per square metre are lower than similar-scale commercial projects, but the new buildings comply with the energy and waste targets set.

Through this process, MMU has achieved a reduction of over ten per cent in the amount of space per student and staff FTE between 2008-09 and 2013-14 at the same time as providing a much higher standard of facilities.

Had this space saving not been achieved, based on the cost per square metre of the estate in 2012-13, MMU would have required an estimated additional £2million per annum without factoring in non-space related costs associated with reductions in duplication of services.

Over the strategy period, the University has also achieved one of the highest rates of growth in income per square metre, which contributes to the longer term affordability and sustainability of the estate.

II. Environmental sustainability

There has been a major transformation in terms of environmental sustainability. In 2007, the University was 97th in the People and Planet League Table. In 2011, it entered the top ten, and in 2012 MMU was awarded the accolade of the UK's greenest university.

The progress made is substantial and long-term in all areas. All the new buildings and campus development have been planned and delivered with environmental sustainability at their heart. The change in the University's overall approach to this area has been far-reaching. It is one its priorities and is a key issue for students interested in minimising their impact on the planet.

III. Building quality

The development of the central Manchester campus and the campus in Crewe, Cheshire was underpinned by a strong desire to build world-class campus environments, both to support MMU's stated ambition to be the University for World-Class Professionals, and develop a renewed sense of institutional pride for staff, students and alumni.

Modern universities are driven by multiple agendas for buildings, as highlighted and promoted in the original Diamond Report. New buildings needed to be fit for purpose, highly flexible, adaptable for student, staff and community usage.

Recognition

The quality of the new buildings has received national recognition. The new Business School was given the Prime Minister's Better Public Building Award and was the BIS, Cabinet Office, Design Council and CABE 2013 winner. The Benzie Building for the Manchester School of Art was one of six projects shortlisted for the RIBA Stirling Prize in 2014.

Positive feedback from students

Comments from individual students in the National Student Survey 2014 are positive about the new facilities. Examples include:

Art and Design student

"The resources and workshops are brilliant with access to new technologies. The new art school building has been an amazing space to work in and has brought the whole faculty together allowing for more interaction and opportunities for collaboration across disciplines."

Hollings student

"The new building and facilities are fantastic. I wish this had been completed sooner as this year has been so much better now we have moved from the Hollings campus in Fallowfield."

Business students

"The new Business School is fantastic. Although I've only had one year in it so far, it's been a dramatic improvement over the old Business School."

"The new business building is a lot better than the old building and has definitely helped me in my final year."

"New Business School is a building that students feel proud to attend"

IV. Impact on the student and staff experience

There are wide ranging impacts covering applications, open day attendance, average tariff points, web views and league table positions amongst many key indicators. The strategy has been emblematic of the University's strategic change agenda to provide the best possible teaching and learning environment for students.

Student Recruitment / Communications

- Initial interest in MMU is peaking in multiple areas of the student recruitment cycle; attendance at open days is up double digits on the 2014 cycle.
- Main web channels are also experiencing their highest views and visits from traffic across the UK and globally.
- For the first time, the University is able to present and project a powerful single campus identity in central Manchester and in all communications throughout the primary undergraduate and postgraduate recruitment cycles.
- Image-wise, the new estate provides opportunities for capturing the high quality student and staff experience and leveraging this to connect with aims and values and the aspirations of students.

Applications and enrolments

- This year the University has received its highest volume of undergraduate applications ever, with more than 62,000 applications.
- While this may not be directly attributable to the new campus buildings, they do heavily influence prospective students when comparing with other HEIs.
- MMU also received good proportional increases in applications from outside the North West region, with increases from London and South East as well as from the South West.
- Enrolments are also at their highest with several of the new buildings already close to capacity due to increased demand and the ability to absorb extra capacity. Business School numbers, already the UK's largest in undergraduate population, have grown by 30 per cent since opening in 2012.
- Average points on entry have increased from around 230 points in 2005 to more than 330 points this year. Without the investment and delivery of new campus buildings, the University considers that this strategic drive towards a higher quality and calibre student intake would be unlikely to have been achieved.

Staff experience

- The staff experience has demonstrably improved in many ways. Equipment is now generally of a high professional standard. IT services and infrastructure are fully up to date and the academic environment for teaching and delivering practical classes has seen a major improvement.
- Staff morale has improved through the previous two staff surveys with greater connectivity with the overall aims and values of MMU.
- A shift towards greater sharing of academic practice and inter-disciplinary working has benefited research and knowledge exchange outputs, and although it is too

early to see the longer-term benefits being realised, collaboration between academic colleagues has increased and research grant applications have risen.

Student experience

- The strategy has enabled the University to create a much stronger digital learning environment with a positive student services culture, connecting timetabling with PC availability, 24-7 library services, catering, sports and a wide range of student services under an overall improvement of the student campus experience.
- MMU academic staff can rely on a high quality and standard approach to learning and teaching technology which improves the academic experience in the classroom. This has supported the redefinition of the curriculum to provide a smarter and deeper subject experience, one which immerses students more fully in their studies.
- Equipment works effectively and PC and Mac availability is in the mid thousands; Wi-Fi is high quality and available across the Manchester campus; parallel investment in library services has been noted by multiple customer service excellence awards. The combination of new technology, infrastructure and buildings has enabled MMU to redefine the student experience.

V. Community engagement

The University's reach into surrounding communities is now much more integrated and visible to many people as a result of being in a single campus in Manchester.

Although infrastructure and quality are key elements of the redevelopment of the estate, the education and social impacts have had to be just as strong, supporting a community with the opportunity to share, work and contribute. The structure, outreach and effect of the project impact groups has been positive, and recognised by HEFCE as a model replicable across the sector in terms of method, structure and impact for redevelopment and relationship management through being wholly integrated into neighbouring communities as well as faculty and professional service activities. Local employment in the construction process exceeded targets. The main contractors engaged with local schools producing artwork concerning site safety and women in construction.

Key examples are – 1) 'The Works' an employer led one-stop-shop supporting local people to find jobs, develop skills and access training courses and financial advice. 2) Bridging the Gap - Giving students from special needs schools a chance to do work experience to equip them with skills to join the general workforce. 3) Business Administration Skills Academy - providing training and work experience to individuals who wish to work in business administration and general administration roles. 4) Hospitality and Facilities Skills Academy - Providing training and work experience to individuals in the hospitality and facilities industries. 5) Lunch with the neighbours.

The Green Impact project, a fun, innovative programme that inspires staff and students to work together to improve the environmental credentials of MMU buildings celebrated with an annual awards ceremony and has been incorporated into the Birley Fields Living laboratory. The first students moved into Birley Fields in September 2014. Living and studying in this 'living laboratory' environment will make students more aware of their sustainable campus surroundings.

The next phase

The opening of the Birley Fields site in 2014 marked the completion of the first phase of the strategy with a total of £350m invested in the academic and residential estate over an eight-year period.

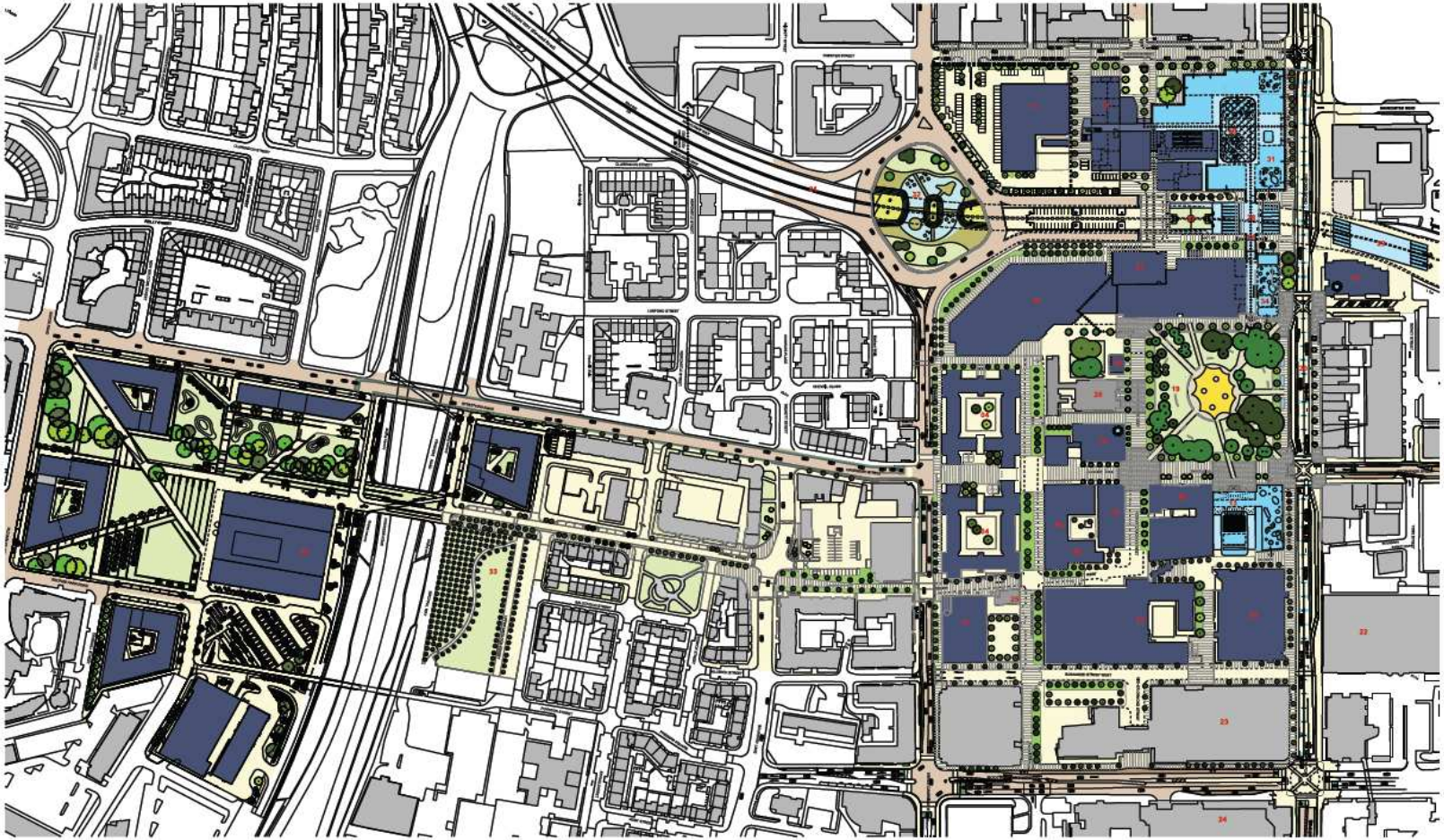
The next phase will predominantly focus on the Manchester city centre campus and will address the needs of two faculties with further specialist laboratory and office accommodation for the Faculty of Science and Engineering and the redevelopment of performance theatre space for the Faculty of Humanities, Languages and Social Sciences. Further expansion of the Birley Fields residential estate is also expected.

All further major infrastructure improvements along Oxford Road will be planned in conjunction with partner organisations associated with the 'Manchester Corridor', including the City Council, Manchester University and Manchester Royal Infirmary Hospital. The aspiration is to link major education institutions in the city centre with the south of the city.

With consolidation of the estate from seven sites down to two, another key task is to focus on the coherence and identity of the campus, particularly the public realm spaces that connect the various buildings and act as the gateway into the campus.

The first phase of the master plan focused on consolidation of the estate through disposal of surplus assets and investment in new developments at key locations in Manchester and Crewe. Moving forward, the objective of the second phase of the master plan is to maximise the functionality and impact of the retained estate for the long term.

PHASE 2 MASTERPLAN



1. University of Strathclyde – Technology and Innovation Centre

The University of Strathclyde is developing a centre for technological research, the Technology and Innovation Centre, in Glasgow City Centre to enable academic and research staff along with industry partners to work together and collaborate on innovative technology programmes. The centre is currently nearing completion.

Key points

Key features of the case study are:

- Transformational project in Glasgow City Centre
- Major project contributing to city centre economic development and regeneration
- Facilities to deliver innovation, collaboration and partnership working between industry and the University (or academia)
- Provision of specialist, shared and flexible laboratory facilities to accommodate current and emerging needs
- Low carbon and low energy building.

Universities Scotland identified the new building as an important project in the sector in its recent Working Smarter Progress Report 2014:

> "Innovative partnerships with the private and public sectors have also enabled significant capital investments in recent years. Partnership with industry has seen the creation of key assets such as the University of Strathclyde's Technology and Innovation Centre, which is projected to have an annual economic impact of £64.5million by 2021/22."

The new landmark facility will house flexible laboratory facilities for multidisciplinary research teams with strengths in engineering, science, business, the humanities and social science. The development aims to strengthen cross-discipline collaboration and partnership working to drive innovation in practical research.

Context

The University of Strathclyde was established when it gained its Royal Charter in 1964 but its roots go back to the foundation of its forerunner, Anderson's Institution, in 1796. John Anderson, Professor of Natural Philosophy at the University of Glasgow, left instructions in his will for a place of 'useful learning' and his vision was realised when the Institution bearing his name opened later the same year. It remains the mission today to combine academic excellence with social and economic relevance for 'the benefit of mankind'.

The University has always had close links with industry and business, and it is now taking the concept of partnership further with the development of the Technology and Innovation in the heart of the city.

Developed with and for industry, the Technology and Innovation Centre has already attracted major partners including Scottish and Southern Energy, the Weir Group, ScottishPower and several other major cross-sectoral industrial partners. The partnership will benefit from participation by large corporations and a large grouping of innovative SMEs.

The centre is the cornerstone investment of Scottish Enterprise's new International Technology and Renewable Energy Zone with the aim of attracting innovative businesses, investment and job creation in low carbon and renewable technologies into the city. Scottish Enterprise's 5000 square metre Inovo building is located adjacent to the Technology and Innovation Centre and can accommodate around 500 staff. This combined investment is forecast to generate 700 new jobs and attract inward investment to Glasgow.

With a construction value in the region of £89million, it is presently the single largest project on site in the Scottish HE sector and is the University of Strathclyde's single biggest investment in its research capacity and infrastructure. The project secured £6.7million of funding from the European Regional Development Fund and a further £26million from the Scottish Government and Scottish Enterprise. The University provided the balance funding of £57million needed to realise the project.

Research in the Technology and Innovation Centre is designed to address major challenges in:

- Low carbon power and energy – focus on solving energy needs from the creation of advanced low carbon and renewable technologies
- Manufacturing – focus on advanced manufacturing and engineering technologies
- Future cities – focus on understanding the city to improve them as better places to live and work and for investment
- Health technologies – focus on health technologies to improve quality of life through disease management and prevention.

The Technology and Innovation Centre will create an environment for the University and its partners to work together on demand led RTD programmes and SME engagement and company creation in these and related areas of research.

The Technology and Innovation Building

The building is nine storeys high, with a gross internal floor area of 25,900 square metres. It is a steel framed triangular structure occupying a sloping brownfield site. Site preparation began in 2012, and the building is due to open in 2015.

Site opportunities were taken advantage of at an early stage. These included assessing the micro climate, the most effective orientation of the building, land use, noise impact, space availability, planning requirements, associated logistics and risk of each technology that was considered for the building.

The building provides flexible open plan offices, conference and laboratory facilities. It has over 100 laboratories and will house up to 700 researchers, academics and Industry partners, all working in collaboration in an environment which nurtures academic and industrial cross-fertilisation opening up new research and commercialisation opportunities.

The range of space types contained within the building reflect its complex character and had an impact on the detailed planning of the building itself. Over one hundred specialist lab and workshop spaces sit alongside research workspace accommodation and the knowledge exchange and social elements that form the core of the development. Key to the building's success are the correct disposition of these various elements to ensure: long term flexibility and the potential to easily re-configure space, ease of servicing, legibility of circulation, using defined and visible cores and attractive accommodation stairs within the atrium void and optimum adjacencies of the various elements to assist partnering and space efficiencies.

As well as research space, the building will also provide conferencing and event facilities, a café and exhibition space including a 450 seat auditorium which can be divided into three self-contained/soundproof areas seating 150.

Benefits of the project

I. Projected economic impact and regeneration

The Technology and Innovation Centre is a major contribution by the University of Strathclyde to the large scale economic development project known as the International Technology and Renewable Energy Zone located in Glasgow City Centre.

The presence of the University in the centre of Glasgow has a qualitative impact through adding to the vibrancy of the city centre and a quantitative impact through capital projects, which support the regeneration of the city centre. In particular the International Technology and Renewable Energy Zone, of which the Technology and Innovation Centre is the largest component, will be a key element in the regeneration of Glasgow city centre and is identified as a regeneration priority in various local and regional planning and regeneration strategies.

The Centre is designed to raise Glasgow's profile internationally and help restore the city's reputation as an Engineering and Technology Centre of Excellence.

II. Business and industry engagement

The development seeks to bridge the gap between academia and industry and in so doing strengthen collaboration and encourage innovation in practical research. Opportunities emerging in growth industries such as renewable energy and enabling technologies provide a renewed focus on the strengths of the University for collaborative research and direct knowledge exchange and interface with industry in these key areas, enabling a rapid technology pipeline, taking projects from concept through demonstration to exploitation.

The Technology and Innovation Centre has attracted funding from major business partners including SSE, Iberdrola, Rolls-Royce, the Weir group, GlaxoSmithKline, Novartis and Astra-Zeneca. In building these partnerships, a variety of flexible engagement approaches and business models have been developed to support strategic programme development, open innovation and effective industry collaboration. The new centre will focus on building these programmes from supply chain partners and innovative small to medium-sized enterprises.

The Centre will provide access to academic staff to accelerate the pace of research and development and bridge gaps between research, technology and commercialisation in the four key sectors of energy, health, manufacturing and future cities.

III. Students

The benefits of working closely with industry are already being delivered to enhance the student experience, through:

- Sponsored collaborative student projects and funded final year research projects
- Industrial placement studentships, scholarships and internship opportunities
- Course content and learning influenced by industry
- Development of applicable and transferrable skills, techniques and knowledge which enhance employability
- Opportunities to build relationships and networks with external partners.

The Technology and Innovation Centre is intended to build on the existing strengths and permeate activities across the University. It brings together multidisciplinary teams to combine strengths in engineering, science, business, humanities and the social sciences. This will benefit the student experience and providing more opportunities for students to interact with external agencies.
The Centre represents an exciting opportunity for all students and staff and will help distinguish the University of Strathclyde as a leading international technological university.

IV. Construction project

The project had a very positive impact on the local economy during construction with 550 staff operatives on site and has exceeded all its targets on new entrants to the construction industry (55), apprentices (27), work placements (49), volunteering projects(4), charitable events (15), engagement with SEs/ SMEs (32), education visits/ community events (24), guest lectures (6), research projects with University students (5), NVQ completions (15) plus NVQ starts (27), Lifelong Learning (48) and training events (138).

V. Low carbon

The building was designed with low carbon principles to the fore in line with the University of Strathclyde Sustainable Design Quality Standard "to incorporate option appraisal and proactive pursuit of the best value options of low and zero carbon technology (LZC) energy options".
The principles of the design are the inclusion of exemplar standards of fabric insulation, air-tightness and energy efficient heating, ventilation and lighting equipment.

A requirement of the Sustainable Design Quality Standard is for the building to have a 30% improvement in regulated carbon emissions, with the 2010 Technical Standard as the benchmark. A roof mounted photovoltaic panel installation will be installed to assist with achieving the carbon reduction target. An area of around 650 square metres of roof mounted panels will be fitted.

The building is on target to achieve 'Excellent' in terms of BREEAM and an 'A' rated EPC Certificate. Every aspect of the building, including contractors design, has been required to follow the University's Sustainability Policy.

2. University of Sunderland - Sciences Complex Project

The case study is about the University of Sunderland's Sciences Complex Refurbishment Project. The upgraded facilities have now been in use for three years.

Over £7million were invested in the development to upgrade and reconfigure more than 4,000 square metres within the complex. The refurbishment was part of wider change project within the Faculty of Applied Sciences which centred on collaboration, partnership and new ways of learning and working. This case study looks at the changes made to the Sciences Complex buildings, including their use and management, to support these innovations.

Key features of the case study

Key features of the case study include:

- Reinvigoration of existing buildings to provide upgraded laboratory, teaching and office facilities
- Transition from department-owned to cross-faculty facilities
- New work environments for staff supporting interaction and collaborative working
- Provision of flexible and effective laboratory research facilities
- Accommodating larger group sizes in laboratories and increasing utilisation
- Efficient space use of shared facilities supported by good practice in timetabling
- Positive impact on the student experience
- Vacating poor quality space as a result of efficiencies in space use through consolidation and shared facilities.

Context

The University of Sunderland has implemented a strategy of consolidation on two campuses. By reducing duplication and providing fit for purpose facilities, the University has been able to rationalise and reduce the size of its estate by over 15 per cent.

Before the refurbishment project was carried out, the Sciences Complex comprised four buildings constructed between 1979 and 1992. There was one entrance with circulation between the four buildings at first floor level via enclosed bridge structures.

The original design concept envisaged the provision of independent subject specific buildings for the Faculty of Applied Science, each containing office, seminar, IT facilities and laboratories. Office accommodation took the form of mostly one or two person cellular offices dispersed throughout the buildings. The configuration of the buildings and the culture and practice around their use created a range of challenges.

One of the key drivers for the project was the new vision for the Faculty. This aimed to change the culture within departments, promote collaborative working, improve interaction between staff and between students and staff, develop research opportunities and engage with the local community and external partners. It was also to deliver innovations in teaching and learning. The original configuration of the complex was a constraint on the realisation of the vision, and the need to address this constraint was a key factor underpinning the plans for refurbishment.

In the years following construction of the buildings, the academic portfolio, research priorities and teaching and learning methods changed significantly. Because the four buildings effectively operated independently, subject teams were isolated, and there was fragmentation and duplication of facilities. Laboratories had low capacities which could not accommodate the growth of cohort sizes, leading to repeat delivery of sessions – up to ten times in Pharmacy.

Space utilisation levels varied, but were generally low, particularly in some laboratories where facilities were considered to be subject specific. Because offices were largely single occupancy and dispersed throughout the buildings, there were few opportunities for staff interaction and collaborative working, and students had difficulties finding and accessing staff.

Project objectives

Against this background, the University concluded that a major refurbishment of the Sciences Complex was required, and that given the climate of funding availability and the need to keep the complex operational, the project should be delivered in phases.

A series of primary and secondary objectives for the project were drawn up. These are shown in the Value Management Diagram overleaf.

The objectives are inter-linked, but those with direct impacts for the estate included:

- Providing high quality learning, teaching and research facilities
- Improving transparency and utilisation of specialist facilities integrating teaching, research and reach out for the benefit of the learning experience
- Integrating environmental and sustainable development targets
- Demolishing temporary buildings.

It was the intention to encourage new ways of working including increased openness and collaboration between academic staff. The project was also designed to encourage inter-departmental collaboration and sharing of flexible facilities and to improve utilisation by creating versatile laboratory space and facilities for use by undergraduates and researchers. This would entail consolidating dispersed uses, so that for example, wet laboratories would be in a single location rather than being scattered within the complex. By consolidating on a single site, the goal was to rationalise under-used accommodation and create opportunity spaces for alternative uses.

Sunderland City Campus
Development of the Sciences Complex

Strategic Planning Group Value Management Tree
7th October 2008

University of Sunderland

Mission Statement *To be recognised by our students as providing them with an excellent academic experience by providing an internationally recognised Centre for Applied Science incorporating a modern, high quality, vibrant environment. To attract and retain students, staff and commercial partners and support the development of the Faculty and University brand on a regional, national and international basis.*

Measures

- City campus development framework
- Completion by target milestones
- Space utilisation metrics
- Academic (teaching and research) quality ratings
- National Student Survey

Primary objectives

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	Objective 7
Improved identity including approach and circulation to, between and within buildings within the science complex	To provide high quality learning, teaching and research facilities	Improved transparency & utilisation of specialist facilities integrating teaching, research and reach out for the benefit of the student experience.	To integrate enviornmental and sutainable development targets	Demolition of temporary buildings and improved public realm to the 'sciences zone'	To support change management objectives under the new Faculty structure	To consolidate the Faculty of Applied Sciences in a single site location

Secondary objectives

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	Objective 7
Formation of a gateway integrating Edinburgh and Science 'Quads' via the campus 'street'	Incoprorate elements of best practice into the design and configuration of academic and support space to integrate teaching, research and reach out	Creation of flexible laboratory space and facilities for use by undergraduates and researchers and improve utilisation.	Supporting biodiversity in the development of the public realm	Vacation of the Ecology Centre and Darwin Annexe to enable demolition by June 2009	Encourages new ways of working including increasing openness and collaboration between academic staff	Rationalisation of underutilised accommodation to create opportunity spaces for alternative use
Creation of new high profile entrance, reception and informal meeting/waiting/ showcase space	Improve collaboration opportunities between students, staff, commerical partners and internal departments	Encourage inter department collaboration and the sharing of flexible facilities	Development of building management systems to support the increasing flexibility of use of the complex	Increase car parking capacity in the Sciences Quad by a minimum of 30spaces	Supports increased interface and collaboration between students and staff	Reconfiguration of accommodation occupancies/layouts to provide synergy between business activities
Formation of new vertical circulation point at the main entrance	To attract commercial partners to support developments in teaching and research	Increase lab capacities to maximise use of resources		Development of the external landscape to incorporate some recereational space	To support culture change in bringing together the new Faculty structure	Colocation of all FAS City Campus activities.
New wayfinding and signage system to support the reconfigured accommodation and improve accessibility	To rebrand the 'Sciences Complex' as a high quality teaching, learning, research and working environment			Provide new secure cycle storage facilities	To provide facilities that can develop with future trends and the changes in the profile of the Faculty	
	To motivate staff and students and create a high quality student experience					

Givens

- Developments to be undertaken in Phases over 1-3years. Phase I to be completed by September 2009
- Total budget for Phase I to be £2m
- Integration of planned maintenance programmes to address backlog and near future maintenace issues
- Integration of access management plan including audit outcomes

Implementation

The University found that the greatest challenge for implementation was the cultural change required to underpin the introduction of new ways of working and new teaching and learning methods. Strong Executive support and change champions in each department were crucial for successful implementation. Extensive stakeholder engagement combined with the role of the change champions and support from a good design team and framework contractor all contributed to the delivery of the project well ahead (30 weeks) of the original programme.

Principal features of the refurbished space

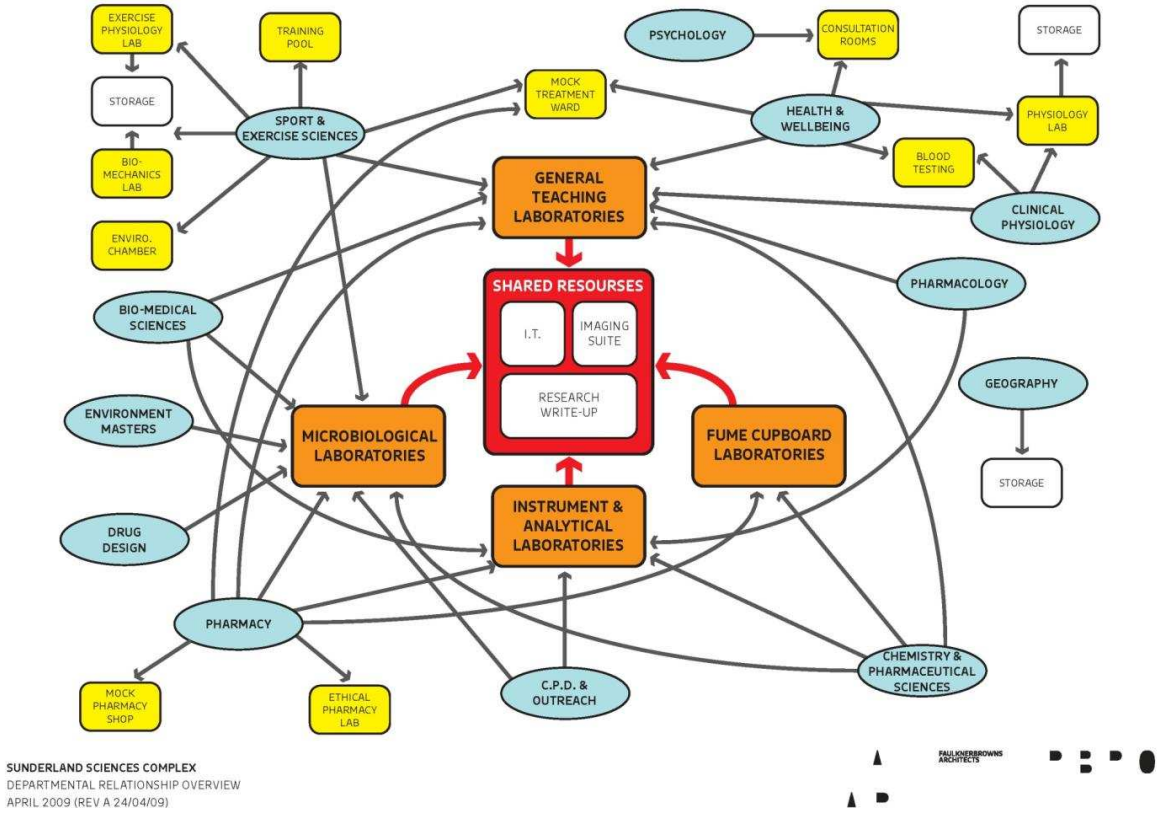
The refurbishment of 4,000 square metres of the Sciences Complex has enabled the University to provide:

- A new central hub for the Health and Science Academy with a highly visible atrium area and reception,
- New high quality teaching and learning facilities, including a professional development suite for the delivery of higher level skills for students and CPD facilities for professionals
- High quality multi-disciplinary science laboratories for teaching, research and commercial activity
- High quality social learning spaces for students, staff and external partners
- Exhibition space to promote science to the wider community, to industry and the health professions.
- Consolidated, shared office space replacing dispersed largely cellular provision.

Shared spaces

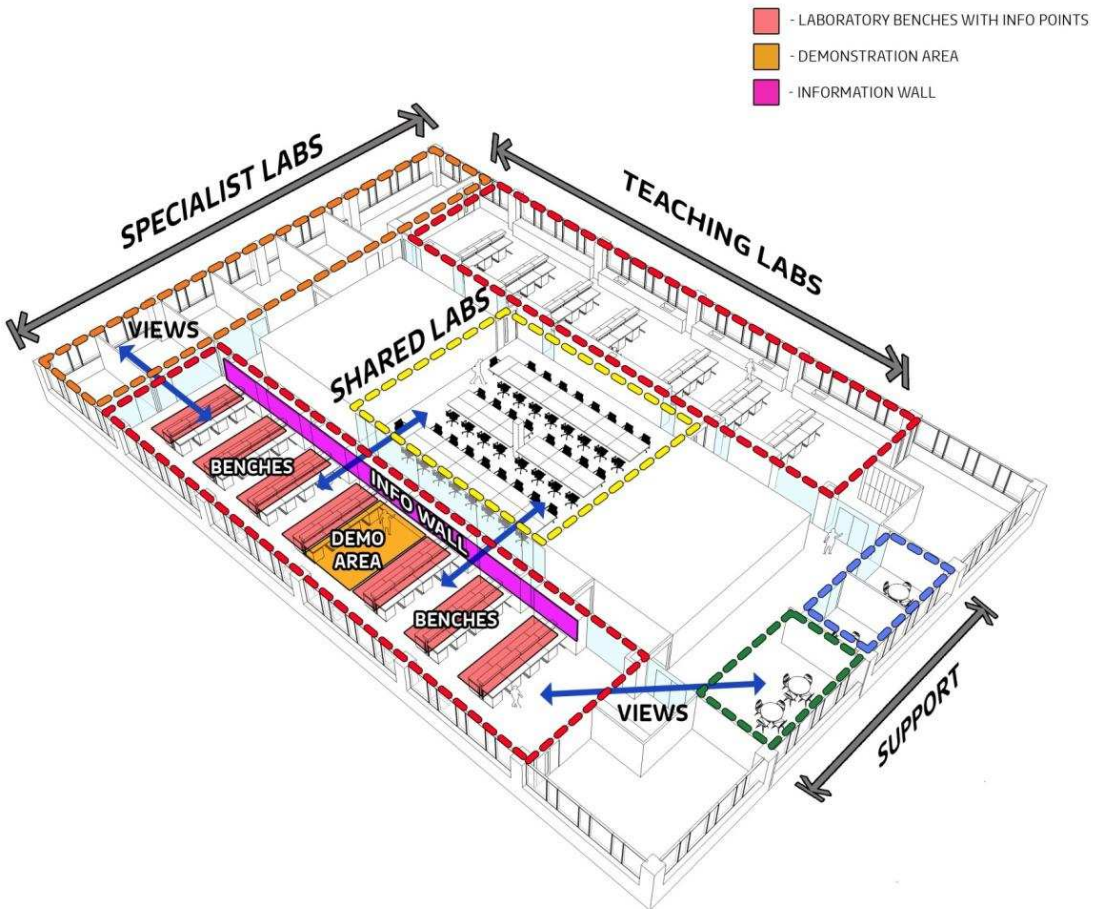
The concept of shared spaces was a key element of the project.

The development of a relationship diagram was central to the identification of the use of facilities by each of the principal subject groups and the extent of the benefits to be gained from shared facilities. In particular, the objective was to provide shared laboratory provision to improve the student experience, standardise facilities and upgrade the quality of teaching and learning environments.



All the specialist analytical equipment was dispersed around the complex in several laboratories. The decision was taken to co-locate it in one specialist laboratory. This had the twin benefits of freeing up space for more general teaching activity and creating a first class analytical suite for teaching, research and commercial purposes and external contract work.

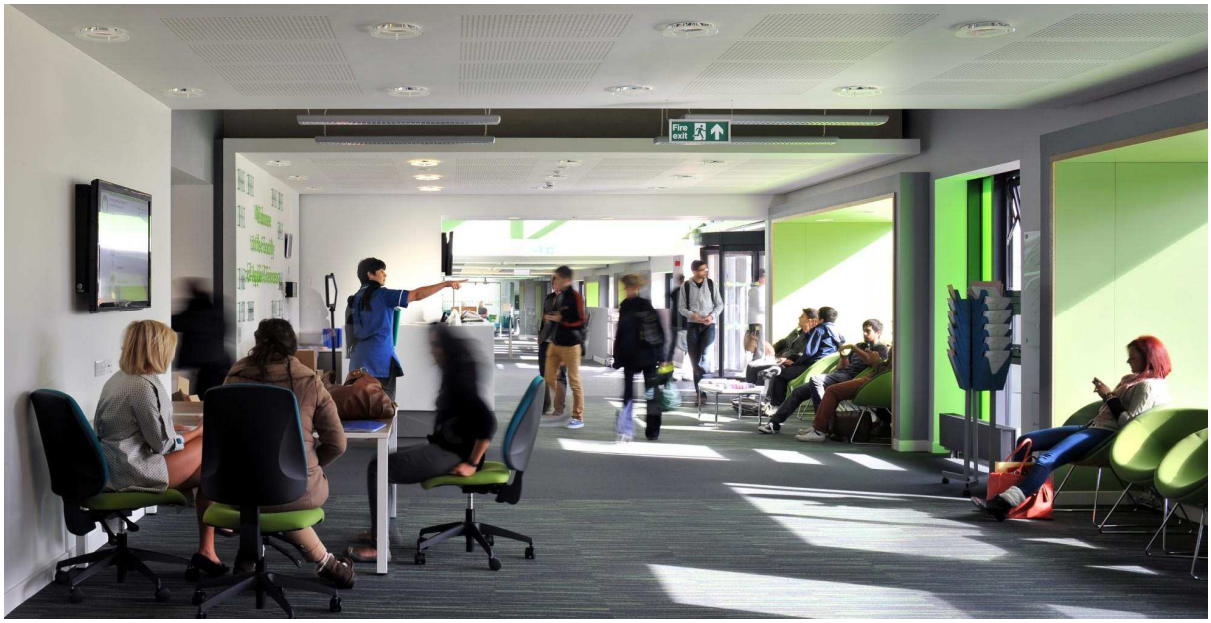
Many different subject areas could make use of the planned new high quality general purpose laboratories, both wet and dry, but to ensure that they were suitable for all activities, a wide range of services was needed. To enable technical staff to store the equipment and consumables, the new prep labs needed to be significantly larger than their predecessors.



This strategy enabled the University to reduce the extent of provision of expensive laboratory infrastructure (fume cupboards, gas lines etc.) with its attendant running costs and space requirements from four buildings to just one.

In terms of staff space, an academic hub was created to promote collaborative working and improve access to academic staff teams. The relocation of staff bases to the accessible part of the complex has encouraged better staff interaction, collaboration and communication. Some staff expressed concerns about the new accommodation on personal productivity. In response, additional facilities have since been created to provide quiet areas (retreats) for concentration.

The new problem based learning room has enhanced facilities for this style of delivery. It is very popular and well-used.



Increased efficiency of use

One of the objectives of the project was to rationalise under-used accommodation. The focus on new ways of working and the development of shared laboratory accommodation enabled the Faculty to vacate a poor quality pre-fabricated building of 660 square metres which had been used as laboratory space. The University's long term plan is to dispose of this space, but it may be needed in the short term for decanting purposes during the next phase of the project.

The new configuration of office space the ratio of space per FTE has reduced from 11.5 to 7.6 square metres. The total area of laboratory space changed from 5,536 square metres to 4,195 square metres, and utilisation has increased from 10 to nearly 30 per cent.

Feedback from students and staff

Before the project began, interviews were carried out with staff and students to act as a baseline for measuring satisfaction with the new environment. The pre and post occupancy evaluations were conducted by Academic Workplace. The results enabled the University to assess the project and to address any areas of concern and respond to the findings in the next phases of the development.

Responses included:

> "Students expressed very positive views about the Sciences Complex refurbishment in the post-occupancy evaluation. In particular, the 'contemporary' aesthetics of the refurbished areas are well-liked, and the overall design is considered to have taken into account student preferences and needs.
>
> The complex, especially its laboratory facilities, is viewed as fostering a positive impression of the University and of how students are valued. The refurbished laboratories are highly regarded, and considered by the majority of users to be an improvement on the previous provision.
>
> The new laboratory facilities are regarded positively by the staff and students who use them, with both groups holding that they provide a stimulating and functional learning environment.
>
> The transition from department 'owned' to cross-faculty laboratories has gone unnoticed by the vast majority of students, and this was not considered to have a negative impact on student sense of ownership or on the wider student experience of using the laboratories. Furthermore, the laboratories are perceived by students as conveying a positive indication of how students are valued by the faculty.
>
> The refurbished environment is perceived by staff as having a beneficial impact on external collaboration – helping to secure research funding and boosting partnership opportunities.
>
> This view is echoed by senior management, from whom there was also assertion that the work environment has also had an indirect impact on external perceptions of the Faculty, by fostering teamwork and in turn the boosting performance and the quality of output of both research and teaching activity."

Future plans

The project described in this case study is the first phase of the longer term plan for the complex. The intention is to undertake a second phase in 2015-16 or soon after to create a second academic hub and continue with a similar approach to the development of laboratory facilities.