

3Ts Hospital Redevelopment Programme

Full Business Case

Management Case: Benefits Realisation



February 2016

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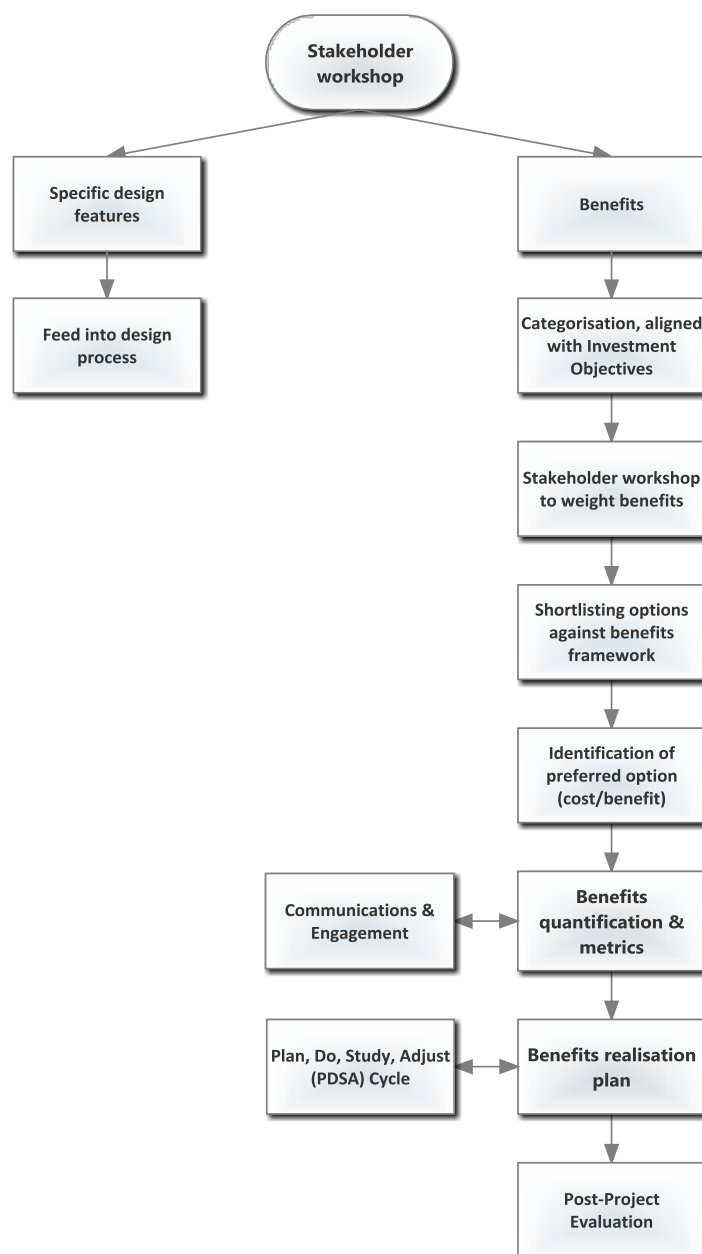
Introduction

1. This section sets out the benefits to be realised through the redevelopment and the approach to benefits management, including:
 - stakeholder engagement to identify benefits opportunities;
 - use in the options appraisal/shortlisting process;
 - read-across to NHS Outcomes Frameworks and commissioning standards;
 - quantification (including cash-releasing benefits/CIPs and quantification of non-financial benefits) and associated evidence base;
 - realisation plan; and
 - plans for ongoing monitoring of delivery, including through the Post-Project Evaluation.

Definition & Approach

2. PRINCE2 defines a benefit as *'a measurable improvement resulting from an outcome that is perceived as an advantage by one or more stakeholders.'* Benefits can therefore accrue to:
 - patients, visitors and staff in the clinical services included within the 3Ts scope (eg. patient experience and clinical outcomes);
 - across the Trust more broadly (eg. improved access and wayfinding to the retained estate); and
 - across the wider health economy and/or society (eg. the evidence¹ that every £1 spent on construction output generates a total of £2.84 in total economic activity).
3. In line with NHSE and TDA guidance (and Drucker's 'management by objectives' concept), benefits are framed as 'SMART' (ie. Specific, Measurable, Assignable, Realistic, Time-related).
4. As illustrated below, the 'inventory' of 3Ts benefits has been used throughout the programme to ensure consistency of approach, including shortlisting options at OBC stage and stakeholder communications & engagement. This will continue into the benefits realisation phase following construction, and used as the framework for Post-Project Evaluation.

¹ L.E.K. Consulting (2009) *Construction in the UK Economy: the Benefits of Investment*



Academic Partnership

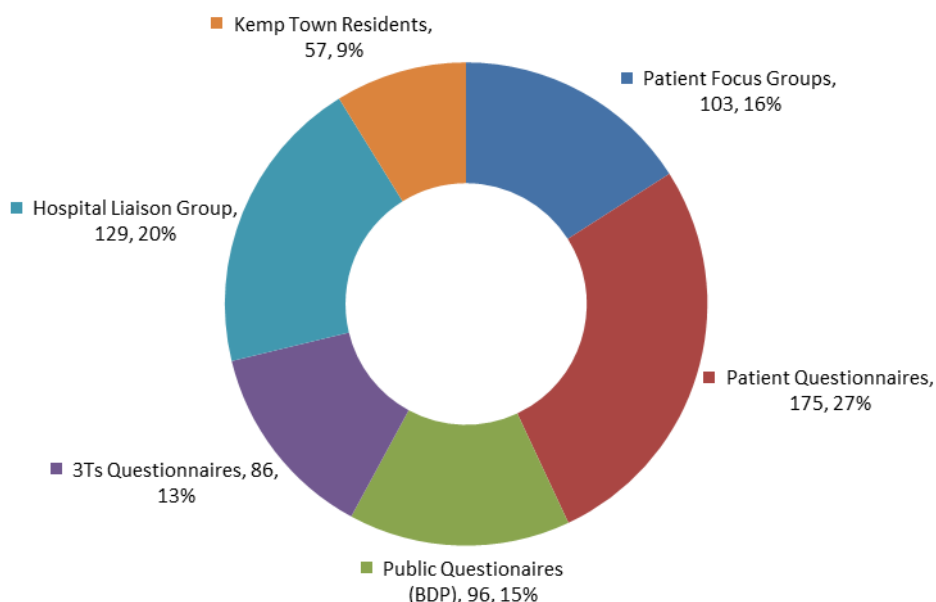
5. In 2008 the Trust established a partnership with HaCIRIC (the Health and Care Infrastructure Research and Innovation Centre) to develop its 3Ts benefits management plan. HaCIRIC is a collaboration between research centres at Imperial College (London) and the Universities of Loughborough, Reading and Salford, and is supported by funding from the Engineering and Physical Sciences Research Council (EPSRC).
6. This partnership has ensured academic rigour, learning from other major projects (both within and outside the NHS) and participation in a wider research programme (in line with the Trust’s role as Teaching Hospital and commitment to the principles of *Innovation, Health & Wealth*).

History & Governance

7. In contrast to other methodologies, HaCIRIC’s approach to benefits realisation emphasises the role of stakeholders in articulating, prioritising/weighting and realising programme benefits. This aligns with the Trust’s philosophy, most recently articulated through its Values & Behaviours blueprint.

8. In 2008, the Trust ran a series of workshops with patients/representatives and clinical and non-clinical staff from across the health economy to describe the benefits that they hoped the redevelopment would realise. This process generated over 300 elements: some were specific design features (which were logged for use at the appropriate stage of the subsequent design process). These were then distilled into a benefits framework, which was further refined through written consultation with workshop participants and other key stakeholders (shown below).
9. Subsequent stakeholder workshops at OBC stage (2008) weighted the benefits framework (ie. ascribed relative priority) and used this to short-list the long list of options. As set out in the Economic Case, the preferred option was selected through a subsequent cost-benefit analysis.
10. As part of the planning process, further consultation was undertaken with key stakeholders as outlined in the following table. This is further described in the communications section in chapter2.

Consultation Methods Chart:



11. Key roles and responsibilities in the benefits management process is set out below.

Trust Role	Responsibility
Chief Executive	<ul style="list-style-type: none"> • Ultimately accountable for the realisation of programme benefits.
3Ts Programme Director/SRO	<ul style="list-style-type: none"> • To ensure the building benefits are delivered and lead the benefit reviews as part of the Programme Plan.
Associate Director(3Ts Governance)	<ul style="list-style-type: none"> • Programme manager. • Responsibility for Benefits Management Strategy and realisation plan.
3Ts Information Analyst	<ul style="list-style-type: none"> • Ongoing development, review and tracking of benefits throughout the life of the programme and post-project. • Liaison with HaCIRIC. • Input to ongoing planning for benefits realisation.
Project Managers and Trust Clinical Leads	<ul style="list-style-type: none"> • Responsible for ensuring that individual projects deliver the benefits required by the programme. • Quantification of benefits and any 'dis-benefits' as identified by the QIA.
3Ts Programme Office	<ul style="list-style-type: none"> • Gathering and distribution of output from quality reviews.

Current Benefits Statement

12. The development/refinement of 3Ts benefits has been an iterative process, both informing and informed by the functional content of the scheme. For ease of presentation, the current statement of benefits has been distilled into seven categories, although these inevitably overlap. (This is more about the multi-faceted nature and synergistic benefit of building design rather than the particular taxonomy).

3Ts Benefits Categorisation, by Investment Objective

Benefit Category	Notes	Barry	Neuro.	Cancer	Trauma	T&R
Clinical outcomes (incl. reduced mortality)	<ul style="list-style-type: none"> This category includes reduced rates of mortality and disability associated with being a Major Trauma Centre, and the radiated benefit of 24/7 Consultant presence in A&E. Where possible, Benefits have been monetised using Quality-Adjusted Life Years (QALYs) to inform the Economic Case. Clinical outcome benefits also have wider societal/economic benefits. 	✓	✓	✓	✓	✓
Quality & Safety (incl. patient experience)	<ul style="list-style-type: none"> This category includes Hospital Acquired Infections and rates of patient trips & falls. There is therefore a significant relationship to the Clinical Outcomes category. It also includes patient experience, eg. visual/auditory privacy, quality of sleep and the ward environment. 	✓	✓	✓	✓	✓
Societal	<ul style="list-style-type: none"> Societal benefits are those where the benefit accrues to wider society, eg Green Travel Plan, inclusion of landscaping as a public amenity. Innovative work has been undertaken with the Department of Health to quantify these benefits through QALYs. This category also aligns with the Trust's responsibilities under the Public Services (Social Value) Act 2012, which requires public authorities to have regard to 'economic, social and environmental wellbeing in connection with public service contracts and for connected purposes.' The process of public engagement in planning the 3Ts redevelopment has also been assessed as conferring a wider health benefit. 	✓	✓	✓	✓	✓
Teaching & Research	<ul style="list-style-type: none"> This category supports the Trust's role as Teaching Hospital for the region, and in training its own staff. 	✓	✓	✓	✓	✓
Building design	<ul style="list-style-type: none"> This category includes efficiency/productivity benefits (in line with the QIPP agenda) achieved through innovative building design, eg. co-location of services/facilities, choice of materials, incorporation of Productive Ward and Productive Operating Theatre principles (NHS Institute for Innovation & Improvement) and connection with the retained estate. It includes workforce efficiencies. It also includes staff amenities, which in turn have been shown to positively impact on patient experience and outcomes as well as staff outcomes (sickness absence, recruitment & retention, engagement and productivity, health and wellbeing). 	✓	✓	✓	✓	✓
Facilities & Estates	<ul style="list-style-type: none"> This category includes backlog maintenance, energy efficiency/carbon footprint and wider Sustainable Development. It also includes right-sizing of plant in 3Ts (using the innovative Occupancy Analytics methodology) and Facilities 	✓	✓	✓	✓	✓

Benefit Category	Notes	Barry	Neuro.	Cancer	Trauma	T&R
	Management service efficiency.					
Income	<ul style="list-style-type: none"> This includes income associated with repatriated activity, additional private patient activity, additional retail and car parking spaces. 	✓	✓	✓	✓	✓

Strategic Alignment

12. The 3Ts benefits (originally developed in 2008) have been mapped against the latest NHS Mandate and NHS/Public Health Outcomes Frameworks (2013, 2014 respectively), QIPP framework, CCG Assurance Framework².

² NHS England (2013) *CCG Assurance Framework*

Current 3Ts Benefits: Strategic Alignment

3Ts Benefit Group	QIPP Element	NHS Mandate	CCG Assurance Framework	Barry	Neuro.	Cancer	Trauma	T&R
1. Clinical (Improved outcomes and reduced mortality)	<ul style="list-style-type: none"> Prevention 	<ol style="list-style-type: none"> Preventing people from dying prematurely Enhancing quality of life for people with long-term conditions 	<p>Domain 1</p> <ul style="list-style-type: none"> Are patients receiving clinically commissioned, high quality services? The CCG consistently demonstrates a strong clinical and multi-professional focus which brings real added value, with quality at the heart of governance, decision-making and planning arrangements to commission safe, high quality and compassionate care for patients. 	✓	✓	✓	✓	✓
2. Quality & Safety (incl. patient experience)	<ul style="list-style-type: none"> Quality Productivity Prevention 	<ol style="list-style-type: none"> Helping people to recover from episodes of ill health or following injury Ensuring that people have a positive experience of care Treating and caring for people in a safe environment and protecting them from avoidable harm 	<p>Domain 3</p> <ul style="list-style-type: none"> Are CCG plans delivering better outcomes for patients? The CCG is delivering improved outcomes within financial resources, supported by clear and credible plans which are in line with national requirements (including excellent outcomes), and local Joint Health & Wellbeing Strategies. 	✓	✓	✓	✓	✓
3. Societal	<ul style="list-style-type: none"> Quality Prevention 	<ol style="list-style-type: none"> The broader role of the NHS in society 	<p>Domain 2</p> <ul style="list-style-type: none"> Are patients and the public actively engaged and involved? The CCG demonstrates active and meaningful engagement with patients, carers and their communities which is embedded in the way that the CCG works. 	✓	✓	✓	✓	✓

3Ts Benefit Group	QIPP Element	NHS Mandate	CCG Assurance Framework	Barry	Neuro.	Cancer	Trauma	T&R
4. Teaching & Research	<ul style="list-style-type: none"> Innovation 	6. Freeing the NHS to innovate	Domain 5 <ul style="list-style-type: none"> Are CCGs working in partnership with others? The CCG has strong collaborative arrangements in place for commissioning with other CCGs, local authorities and NHS England, as well as appropriate external commissioning support services and wider stakeholders including regulators. 	✓	✓	✓	✓	✓
5. Building design	<ul style="list-style-type: none"> Quality Innovation 	5. Treating and caring for people in a safe environment and protecting them from avoidable harm	Domain 1 <ul style="list-style-type: none"> Are patients receiving clinically commissioned, high quality services? The CCG consistently demonstrates a strong clinical and multi-professional focus which brings real added value, with quality at the heart of governance, decision-making and planning arrangements to commission safe, high quality and compassionate care for patients. 	✓	✓	✓	✓	✓
6. Facilities & Estates	<ul style="list-style-type: none"> Productivity 	5. Treating and caring for people in a safe environment and protecting them from avoidable harm	Domain 1 <ul style="list-style-type: none"> Are patients receiving clinically commissioned, high quality services? The CCG consistently demonstrates a strong clinical and multi-professional focus which brings real added value, with quality at the heart of governance, decision-making and planning arrangements to commission safe, high quality and compassionate care for patients. 	✓	✓	✓	✓	✓
7. Income	<ul style="list-style-type: none"> Productivity 	8. Finance	Domain 3 <ul style="list-style-type: none"> Are CCG plans delivering better outcomes for patients? The CCG is delivering improved outcomes within financial resources, supported by clear and credible plans which are in line with national requirements (including excellent outcomes), and local Joint Health and Wellbeing Strategies. 	✓	✓	✓	✓	✓

ID	Category	Benefit Title	Benefits Description	Responsibility
C1	Clinical (Improved outcomes and reduced mortality)	<p>Mortality / Improved Outcomes</p> <ul style="list-style-type: none"> - Major Trauma - Out of hours emergency admissions 	<p>Reduced mortality and improved outcomes rates for repatriated major trauma patients</p> <ul style="list-style-type: none"> - Repatriated and current - Traumatic injury is a global burden and largely contributes to death and disability across the UK. For every trauma death at least 2 people are left with severe and permanent disability and the effects of traumatic injury have considerable long term implications upon the quality of life of its survivors. In 2010, it was estimated that there were 5,000 deaths in England with at least 11,000 patients suffering life-threatening injuries. A further 23,000 cases represent a serious single injury that will require specialist care. As a result of traumatic injury, there is also a significant impact upon the associated costs to the NHS. Evidence has shown that reduced travel times and helipad access reduce mortality for trauma patients. - Clinical adjacencies also contribute to this according to research (see outcomes for thrombolysis and interventional radiology too) - The additional patients attending RSCH rather than London hospitals for major trauma are expected to reduce mortality rates (see link for calculations). - Improvements are based on peer alignment analysis (also attached). <p>Improved outcomes for patients admitted to A&E wards outside core hours</p> <ul style="list-style-type: none"> - Due to more timely consultant triage & diagnostic requests. Consultant cover in A&E 24/7. - Radiated benefits due to the introduction of a major trauma centre at RSCH. - Clinical adjacencies also contribute to this according to research. 	Chief of Trauma
C2	Clinical (Improved outcomes and reduced mortality)	<p>Mortality / Improved Outcomes</p> <ul style="list-style-type: none"> - 3Ts Specialties - All BSUH 	<p>Reduced mortality rates for 3Ts specialties.</p> <ul style="list-style-type: none"> - Clinical adjacencies and radiated benefits of new facility contribute to reduced mortality (Cornwell EE 3rd1, Chang DC, Phillips J, Campbell KA 2003) <p>Improved outcomes for patients requiring multi-disciplinary interventions for stroke.</p> <ul style="list-style-type: none"> - Clinical adjacencies with stroke and neuro proven to contribute to this according to research. Impact of centralising acute stroke services in English metropolitan areas on mortality and length of hospital stay: difference-in-differences analysis (BMJ 2014;349:g4757 doi: 10.1136/bmj.g4757 (Published 5 August 2014)) 	Chief Medical officer
QS1	Quality and safety	Privacy and Dignity	<p>Improved patient level of satisfaction with privacy and dignity.- Increase privacy and dignity- Increased opportunity for sex segregation- Improved infection control (measured elsewhere)- Increased choice of accommodation (i.e. single rooms or bays) Press Ganey’s 2003 national satisfaction survey using data from 2.1m patients in 1,462 facilities found that satisfaction with noise</p>	Director of 3Ts

ID	Category	Benefit Title	Benefits Description	Responsibility
			<p>levels was on average 11.2% higher for patients in single rooms- Increased choice for end of life care for patients and relatives (The CQC's guidance that people should be 'able to have those people who are important to them with them at the end of their life.')</p> <p>McKeown et al (2010) found that that single rooms were associated with substantial improvements in end of life care. In the Place audit of 2014 we were 5.11% below the national average for the appearance of RSCH and 3.74% below the national average for the assessment of privacy and dignity.- Decrease in outside journeys around the site (porter in bed)- Decrease in patient transfers due to co-location- Improved toilet and bathroom facilities- Dedicated waiting areas- Options for overnight stays for visitors- Improved facilities for Bariatric patients.</p>	
QS2	Quality and safety	Patient Falls	<p>Reduction in the number of patient falls.</p> <ul style="list-style-type: none"> - Number of patient falls expected to reduce due to improved room design, position of en-suites in single rooms and same handed design. Ulrich et al 2008 found that the main cases of falls in hospital were transfers from bed (38%) and transfers to the toilet (16.1%). - NHS National Patient Safety paper (linked) estimates £115 cost per bed due to falls in average acute hospital. p14 Reference Sign up to Safety Campaign and the saving of 6000 lives. <p>Note: there is also evidence to suggest single room increases the number of falls so this has not been monetised at FBC.</p>	Chief Nurse
QS3	Quality and safety	Infection control	<p>Reduction in the number of HCAI incidents in 3Ts specialties.</p> <p>Drinka et al (2003) found that patients in multi-bed rooms where a roommate has 'flu had a 3.07 higher relative risk of acquiring the illness than individuals in single rooms.</p>	Director of 3Ts
QS4	Quality and safety	Externally Reported Performance/ KPI data / CQC	<p>Improve Trust Quality Performance and KPI Data</p> <ul style="list-style-type: none"> - Clinical benefits of being a teaching hospital with a new development improves overall hospital performance in evidence. - Radiated benefits of scheme will impact all areas of the hospital, maintaining current standards and improving all areas is expected benefit. <p>Continued CQC Compliance</p> <ul style="list-style-type: none"> -Recent CQC audits acknowledge the new building will address some issues, currently conditionally compliant due to 3Ts. :Outcome 1 (respecting and involving service users) p44 (privacy/SSA) Outcome 4 (care and welfare of service users) 	Chief Nurse

ID	Category	Benefit Title	Benefits Description	Responsibility
			<p>General point that we will be caring for patients in safer environments etc. Outcome 8 (cleanliness and infection control) Outcome 10 (safety and suitability of premises) Outcome 11 (safety and suitability of equipment) e.g. storage, continuity of utilities, etc.</p> <p>Improvement on Cancer target performance - Improvement on meeting targets for Cancer Performance due to additional capacity in stage 2 development.</p>	
QS5	Quality and safety	Reduced critical care outliers	<p>Reduction in number of critical care outliers at RSCH (ward patients in cc beds) - Due to the increase in capacity the number of patients in ward beds that should be in critical care beds is expected to decrease. - The level of care for critical care patients is known to be more appropriate in a designated critical care bed.</p>	Chief Nurse
QS6	Quality and safety	Reduced Patient Moves	<p>Reduction in patient moves between sites and improvement within RSCH. -Due to the co-location of services the number of patient moves/transfers is expected to decrease. - Improved links within RSCH benefit porters and patients. - Between ward and site to be compared. Evidence that reducing transfers improves patient safety by reducing clinical errors. Research finds that reduced transfers reduce both medication errors and length of stay(Press Ganey 2003). (The King’s Fund suggests that each patient move is associated with an additional day’s length of stay).</p>	Chief Nurse
QS7	Quality and safety	Patient Flow	<p>Improved Patient Flow/ Reduced LoS for 3Ts specialties (current modelling shows possible efficiencies in Oncology and HIV / ID)-Improve Day Case Rates for 3Ts specialties (specifically PIU in neuro)-Reduce Occupancy for 3Ts specialties-This is not currently monetised for CIPs</p>	Chief Operating Officer
S1	Societal	Local economy	<p>Local construction economy will benefit due to 3Ts. - Links between health and employment also referenced (2014 Rowntree Report) see web link-Construction workforce and workforce development benefit.-Local retailer benefit.-Benefits to local economy from construction are £2.84 for every £1 spent according to research, please see attached. -The additional student numbers caused by the expansion of BSMS have been estimated to bring an extra £14m into the city based on an increase of 100 per year (and the local economy already receives over £1b per year via the Universities).</p>	Director of 3Ts
S2	Societal	Patient Travel	<p>Reduced patient cost for travel and more positive local patient experience due to less distance to travel. - Repatriated patients from London to RSCH or RSCH to cancer satellite sites will travel less following</p>	Director of 3Ts

ID	Category	Benefit Title	Benefits Description	Responsibility
			<p>the 3Ts project delivery. - See attachment for calculation details. Miles saved and cost to patient.</p>	
S3	Societal	Work environment	<p>Improved work environment for staff will lead to societal benefit. - Quality of working environment e.g. access to outside space and views of nature. (Ulrich R. and Zimring C. 2008). Improved satisfaction and engagement leads to better organisational performance, including reduced turnover and sickness absence (MacLeod, D. and Clarke, N., 2012) - DEFRA report (UK national Ecosystem Assessment 2011) suggests that view of outside space equates to value of £300 per year per person.</p>	Director of 3Ts
S4	Societal	Patient Involvement in Design	<p>Improvements in patients, staff and local resident satisfaction due to patient involvement. - Improved links with local community - Improved trust reputation within the local community.</p>	Director of 3Ts
TR1	Teaching and research	BSMS	<p>Increased research activity and research income for BSMS.- Radiated benefits of scheme, increased profile for the medical school and the Research/Simulation suite planned in Stage 1 are expected to increase income. In 2010/11 research income for BSMS exceeded the £3.042m target.- These benefits are expected to stimulate research activity (in OBC) 10% increase assumed = £300 000 additional funds p.a. Reference, BSMS Strategic Plan 2009 -2014. There will be increased opportunities for engagement and work with industry.</p> <p>Improvement in BSMS students’ academic achievements.- Due to radiated benefits and additional facilities the demand for places and number of students is expected to be increase subject to funding. Moreover post graduate student numbers will also increase, bringing increased income.Improvement in</p> <p>BSMS student satisfaction with environment.- Additional BSMS facilities within the 3Ts scheme should lead to an increase in student satisfaction.- Existing facilities expected to improve (erg. space in an OP C/E room, space around the patient bed).</p> <p>Improved access to more varied case-mix for BSMS students and improvements in the quality of care.- The addition of the major trauma centre will result in a more varied case mix for students. The improved case mix and increase in research activity will also contribute to improvements in the quality of care for patients within the catchment area. This because there will be a net increase in the skill level which will be of benefit to local patients. This result in repatriated activity, as the skills of our medical workforce continue to grow. There will be associated increases in the complexity and levels of</p>	Dean of BSMS

ID	Category	Benefit Title	Benefits Description	Responsibility
			<p>case mix, and an increase in cross-disciplinary work. The simulation suite will contribute to this improvement by providing additional opportunities for work at a higher level.</p>	
TR2	Teaching and research	BSUH Research and Development	<p>Increase research activity and evidence based health care in BSUH.</p> <ul style="list-style-type: none"> - Radiated benefits of scheme are assumed to impact the trust as a whole with the increased profile for the medical school. Research/Simulation suite planned in Stage 1. In 2010/11 clinical research income was £6.1m - This benefit arises from inclusion of CIRU, synergy between services (co-location) and expansion in Consultant workforce (so opportunities for sub-specialisation), and the BSMS CfIT development in Stage 2. Teaching hospitals can generate 5% income from R&D. Our income is currently 1%. Comparison with UH Birmingham is that 4.4% income is from research. Some research also suggests that research aware environments positively impact on care (See NIHR hyperlink). <p>Increase number of patients participating in BSUH clinical trials.</p> <ul style="list-style-type: none"> - The 3Ts scheme will expand research opportunities for CIS, radiology and dementia. - The co-location with BSMS and CIRU is expected to increase study numbers and patient recruits. 	Director of Medical Education
TR3	Teaching and research	BSUH Training	<p>Training opportunities for BSUH staff to increase across specialties.</p> <ul style="list-style-type: none"> -Baselines not available, awaiting confirmation from trust educational strategy. Internal specialty level training data not currently collated. - Room availability is the only tangible benefit. <p>Training opportunities for BSUH staff to increase.</p> <ul style="list-style-type: none"> - Introduction of training programmes for stroke/neurology and other interdisciplinary initiatives. Increase in interdepartmental training for stroke and neurology specialties. - Joint learning events. - Baselines not available, awaiting confirmation from trust educational strategy. Internal specialty level training data not currently collated. -There will also be the opportunity to create an academic surgical department for the first time. 	Director of Medical Education
BD1	Building design	Patient satisfaction	<p>Improved patient satisfaction with RSCH environment.-Improved facilities café, retail, car parking. - Improved environment due to 3Ts Arts policy, therapeutic design. Some evidence that improved arts enhancements can lead to reduced LOS and better management of pain and distress- Benefits of access to green space (therapeutic landscape).- Access to patient information room.- Heritage area.Patient satisfaction with journeys at RSCH to improve.-Improved design and way finding within the new facility will reduce travel time and the number of outside journeys.- Ease of navigation will be</p>	Director of 3Ts

ID	Category	Benefit Title	Benefits Description	Responsibility
			improved.- Number of lift journeys to decrease for majority of patients. - Decrease in outside journeys.- Bad weather causes problems with moving patients to and from Barry, redevelopment resolves.	
BD2	Building design	Staff satisfaction	Improvement in overall level of staff satisfaction with the premises. - Staff performance improvement also evidenced. - Principals of productive ward to lead to improved staff satisfaction. Standardisation leads to improved efficiency. Daylight leads to increased productivity - Reduced Recruitment costs, reduced bank/agency costs. Reduced sickness and turn over - Currently under investigation. - Detailed analysis of RACH, Birmingham and Pembury has shown improvements are to be expected in areas of sickness and turn over.	Director of 3Ts
BD3	Building design	Flexible rooms	Access to multi -functional rooms, improved level of ease to adapt for accommodating new services. - Flexibility in design leading to possible increased range of services offered at RSCH.	Director of 3Ts
BD4	Building design	IT Enabler	The redevelopment will be a key 'enabler' to all future IT projects. - Design of building will ensure compatibility of future IT projects. - E.g. Future proof cabling, space allocated for self-booking equipment. - Monetised benefits unique to IT business cases.	Director of 3Ts
EF1	Estates and facilities	Estates Compliance	Improved BREEAM excellence rating at RSCH. - AEDET/ASPECT and NEAT rating. Improved estates compliance at RSCH. - New buildings will improve DDA compliance by replacing incompliant Barry building. - % of compliance with HTM and HBN standards. Also increase in operational acceptability and space utilisation	Director of 3Ts
EF2	Estates and facilities	Carbon Footprint	Reduction in carbon footprint at RSCH. - Energy efficiency initiatives in design and building. - Occupancy analytics in 3Ts design contributed to this. - OBC numbers/estates strat said 3Ts would be the main driver in reaching the 25% improvement required. - Recent research from Health Research and Education suggests that energy efficient hospitals can make savings of between 10%-25% which equates to savings of £500 000 pa.	Director of 3Ts
EF3	Estates and facilities	Backlog Maintenance	Reduced backlog maintenance at RSCH. - Measured for estates strategy, risk adjusted saving due to 3Ts of 1.1m p.a.	Director of 3Ts

EF4	Estates and facilities	Porter Journeys	<p>Increase in porter efficiency at RSCH.</p> <ul style="list-style-type: none"> - Due to streamlined and linked buildings and services the efficiency of porter service is expected to increase. - The number of 2 porter journeys is expected to decrease due to improved design in the new building. - Bad weather causes problems with moving patients to and from Barry, redevelopment resolves. 	Director of 3Ts
EF5	Estates and facilities	Security	<p>Reduction in the number of security related reported incidents.</p> <ul style="list-style-type: none"> - Reduction of violent incidents for staff and patients expected. (Design with Intent 2010) 	Director of 3Ts
I1	Income	Repatriation - Commissioner/ Trust	<p>Financial saving for commissioners.- Due to the 3Ts development, activity currently going out of area will be repatriated to RSCH.- Repat activity change saves the difference in MFF Rates (London vs. Brighton).- See attached for calculations.Increased income for BSUH- Income generated by repatriation of residents previously treated out of area i.e. neurosurgery (Trust Benefit).</p>	Chief Financial Officer
I2	Income	Car Park	<p>Increased income from car parking and increase in capacity.</p> <ul style="list-style-type: none"> - This leads to increased income for trust. This improves patient satisfaction 	Chief Financial Officer
I3	Income	Retail	<p>Increase in retail space and income at RSCH.</p> <ul style="list-style-type: none"> -This leads to increased income for trust. 	Chief Financial Officer
I4	Income	Enabled Growth	<p>Increase in capacity, leading to enable growth and additional income at RSCH.</p> <ul style="list-style-type: none"> - This is currently under investigation, awaiting outcome. Current data is placeholder. - Potential area in non 3Ts site to expand in CC, Neuro, CIS, Oncology. - Creating spare capacity for RSCH site on a whole, to be confirmed. - Medicine beds are not increasing capacity. <p><i>NOTE: This is not quantified in LTFM or 3Ts FBC economic case.</i></p>	Chief Financial Officer
I5	Income	Private Patient Income	<p>Potential increase in private patient activity and income.</p> <ul style="list-style-type: none"> -The 3Ts has shell area that could be private patients. - Enabled growth for 3Ts specialties increases current private patient income. - Increase in single rooms creates greater flexibility for private patients use. 	Chief Financial Officer
I6	Income	Productive Ward	<p>Workforce savings at RSCH in 3Ts specialties.</p> <ul style="list-style-type: none"> - Single rooms and change in ward template are expected to change workforce requirements for 3Ts beds. Although some evidence shows that while single rooms can increase staff requirements there are known grade mix changes that may decrease overall cost. - Radiated benefit of the new and improved facility. - Full productive ward enablement. 	Director of Nursing

			- Improved staff satisfaction due to the new facility. NOTE: This is still under investigation as single rooms could increase workforce costs.	
17	Income	Outsourcing of New Facilities	Additional Income to BSUH by outsourcing the teaching suite. Option to provide income for rust by outsourcing R & D- 600 sq. mtr of teaching suit could be rented out commercially. Limited less availability (1/3) so could aim for a CIP of £110 000 pa.	Chief Financial Officer
18	Income	Cost/Fine Avoidance	Reduced fines for BSUH -Cdiff and MRSA fines expected to reduce by 60% (conservative estimate) as Grant ward being replaced. -Fines avoided due to increased capacity and improved patient flow re ambulance handovers can be counted as we are increasing beds.	Chief Financial Officer

Note: The full list of benefits with supporting data/calculations, timings, targets and monetisation is appended.

Quantification of Benefits

Non-Financial Benefits

13. Innovative work has been undertaken with Department of Health economists to try to monetise non-financial benefits, using the Quality-Adjusted Life Years (QALY) framework. This approach has enabled these benefits to be reckoned into the economic analysis, giving effect to the Public Services (Social Value) Act. The calculations behind the QALY assumptions are appended.

Financial Benefits

14. These benefits include both cash-releasing (CIPs) and productivity/efficiency benefits. 3Ts-related CIPs (both those uniquely delivered by the 3Ts programme and those to which the 3Ts development will contribute) are set out in the Economic Case and have been factored into the Trust Long-Term Financial Model. They will in due course form part of the Trust-wide three-year rolling CIPs programme, which currently extends to 2016/17. These CIPs are appended and explained more fully in the Financial Case.

Contributory Benefits

15. Some benefits can be directly attributable to the redevelopment (eg. improvements in patient privacy & dignity). In other cases, there is evidence that the redevelopment will contribute but is not solely responsible (eg. reductions in inpatient Length of Stay). A best estimate has been used to quantify these benefits, and these are fully aligned with other Trust major programmes/targets (eg. performance improvements set out in the Clinical Strategy).

Planning Horizon

16. The majority of benefits will be realised on occupation of each stage of the redevelopment. However some benefits are expected to have a lead-in time (up to two years following completion of each stage of the building).
17. Unless a benefit has been identified as shorter-term, the financial benefits quantification assumes a 60 year lifetime, in line with the costing of the 3Ts building as an asset.

Baseline

18. Work has been undertaken to form verifiable baselines for each benefit, against which progress/success will be measured. Methods have included patient surveys and focus groups (eg. for patient/visitor wayfinding) as well as existing Trust data/metrics (eg. inpatient Length of Stay).

Evidence Base

19. Quantification of benefits has drawn on the available evidence base (included in 3Ts bibliography). This is set out in detail in the full Benefits Realisation matrix (appended). Examples are shown in the table below.

Examples of Evidence Base Supporting Benefits Quantification

Category	Benefit	Evidence Base
Clinical outcomes (incl. reduced mortality)	<ul style="list-style-type: none"> • Improved clinical outcomes/reduced mortality (major trauma) • Improved clinical outcomes for other specialties • Reduced patient falls 	<ul style="list-style-type: none"> • Traumatic injury is a global burden and largely contributes to death and disability across the UK. For every trauma death at least 2 people are left with severe and permanent disability and the effects of traumatic injury have considerable long term implications upon the quality of life of its survivors. In 2010, it was estimated that there were 5,000 deaths in England with at least 11,000 patients suffering life-threatening injuries. A further 23,000 cases represent a serious single injury that will require specialist care. As a result of traumatic injury, there is also a significant impact upon the associated costs to the NHS.³ • Evidence has shown that reduced travel times and helipad access reduce mortality for trauma patients. - Clinical adjacencies also contribute to this according to research (see outcomes for thrombolysis and interventional radiology too)⁴ • Improved outcomes for patients admitted to A&E wards outside core hour due to more timely consultant triage & diagnostic requests and consultant cover in A&E 24/7.
Quality & Safety (incl. patient experience)	<ul style="list-style-type: none"> • Enhanced patient privacy & dignity • Reduced rates of Hospital-Acquired Infections • Reduced inpatient Length of Stay 	<ul style="list-style-type: none"> • Gabor et al⁵ found that total sleep time was 9.5 hours in single rooms vs 8.2 hours in multi-bed bays, despite a similar number of disturbances. The noise level was 43 dB vs 51 dB. Improved quality of sleep is associated with faster recovery rates⁶, reduced stress and anxiety and reduced physiological changes such as elevated heart rate and blood pressure⁷. • Ulrich⁸ found that the main cases of falls in hospital are transfers from bed (38%) and to the toilet (16.1%). Design enhancements in 3Ts such as low-level/floor lighting, an innovative design for a continuous handrail from inpatient bed to bathroom, and bathroom/toilet design that enables transfer

³ RCSEng Provision of Trauma Care Policy Briefing from 2007 which asserts, 'Trauma centres have significant improvements in quality and process of care. This effect extends to non-trauma patients managed in these hospitals'

⁴ Cornell EE et al. (2003) Enhanced Trauma Program Commitment at a Level 1 Trauma Center. Effect on Process & Outcome of Care.

⁵ Gabor, JY., Cooper, AB., Crombach, SA., Lee, B., Kadikar, N., Bettger, HE. et al. (2003). 'Contribution of the intensive care unit environment to sleep disruption in mechanically ventilated patients and healthy subjects'.

⁶ Dellinger, B. (2010) *Healing Environments*. In: McCullough, C. eds. (2010) *Evidence-based design for healthcare facilities* p.45-79.

⁷ Morrison, WE., Haas, EC., Shaffner, DH., Garrett, ES. and Fackler, JC. (2003). 'Noise, stress and annoyance in a paediatric intensive care unit'. *Critical Care Medicine*, 31(1), 113-119.

⁸ Ulrich RS. et al (2008) *A review of the Research Literature on Evidence-Based Health Care Design*. The Center for Health Design.

Category	Benefit	Evidence Base
		<p>from both left and right are expected to reduce trips and falls.</p> <ul style="list-style-type: none"> • Press Ganey’s 2003 national satisfaction survey using data from 2.1m patients in 1,462 facilities found that satisfaction with noise levels was on average 11.2% higher for patients in single rooms⁹. • The design will also improve rates of HAIs: Drinka et al found that patients in multi-bed rooms where a roommate has ‘flu had a 3.07 higher relative risk of acquiring the illness than individuals in single rooms¹⁰. • The increased proportion of single rooms will enable the Trust to better meet the End of Life quality standard. McKeown et al found that that single rooms were associated with substantial improvements in end of life care¹¹. • 3Ts will substantially improve the patient experience as demonstrated by our PLACE scores which are below the national average for both Privacy/Dignity and for appearance at RSCH. The national average for cleanliness was 97.3% with our lowest score being 87.5%. The national score for privacy and dignity was 87.73 whilst the score at RSCH was 83.99%. The performance of BSHU for Appearance and Maintenance was similarly poor at 86.86% compared to a national average of 91.97%.
Societal	<ul style="list-style-type: none"> • Services closer to home/reduced travel time • Social Value benefits from investment in construction 	<ul style="list-style-type: none"> • A recent meta-analysis indicated that there is 'solid evidence that community engagement interventions [defined as involving communities in decision-making and in the planning, design, governance and delivery of services] have a positive impact on health behaviours, health consequences, self-efficacy and perceived social support outcomes, across various conditions.'¹²
Teaching & Research	<ul style="list-style-type: none"> • Increased research activity • Bespoke teaching facilities 	<ul style="list-style-type: none"> • Increased income from a research-active teaching hospital will impact on the trust as a whole with the increased profile for the medical school. Research/Simulation suite planned in Stage 1.¹³
Building design	<ul style="list-style-type: none"> • Patient/visitor and staff satisfaction • Improved operational efficiency 	<ul style="list-style-type: none"> • Planning for 86% occupancy and 65% single rooms will mean fewer transfers between rooms/wards. Research finds that reduced transfers reduce both medication errors¹⁴ and Length of Stay¹⁵. • The NHS Institute for Innovation & Improvement found that the Productive Ward Initiative reduced

⁹ Press Ganey (2003). *National satisfaction data for 2003 comparing patients with versus without a roommate.*

¹⁰ Drinka, P., Krause, P., Nest, L., Goodman, B., & Gravenstein, S. (2003). Risk of acquiring influenza A in a nursing home from a culture-positive roommate.

¹¹ McKeown, K. and Haase, T. and Pratschke, J. et al. (2010) Dying in Hospital in Ireland: An Assessment of the Quality of Care in the Last Week of Life

¹² O’Mara-Eves, O, et al (2013) Community engagement to reduce inequalities in health: a systematic review, meta-analysis and economic analysis

¹³ Teaching hospitals can generate 5% income from R&D. Our income is currently 1%. Comparison with UH Birmingham is that 4.4% income is from research.

¹⁴ Ulrich, R. and Zhu, X. (2007). Medical complications of intra-hospital patient transports: Implications for architectural design and research.

¹⁵ Patterson, L. (2012) Wrong bed ,wrong ward

Category	Benefit	Evidence Base
		patient Length of Stay and improved safety – both significant contributors to efficiency. <ul style="list-style-type: none"> • More recent evidence found that an improved nursing environment reduces readmissions (although some of these reductions were possibly associated with improved staffing ratios)¹⁶.
Facilities & Estates	<ul style="list-style-type: none"> • Improved operational efficiency • Increased sustainability and resilience 	<ul style="list-style-type: none"> • The provision of improved amenities such as outside space is confirmed as beneficial to the health of both patients and staff^{17, 18}. Improved satisfaction and engagement leads to better organisational performance, including reduced turnover and sickness absence (MacLeod, D. and Clarke, N., 2012) • The evidence suggests that that an improved working environment (eg. views of green space¹⁹) improves employee satisfaction²⁰. Improved satisfaction and engagement leads to better organisational performance²¹, including reduced turnover and sickness absence, higher productivity and patient/customer satisfaction, and improved patient outcomes.
Income	<ul style="list-style-type: none"> • Additional parking income • Avoided cost of non-compliance with statutory and regulatory requirements 	<ul style="list-style-type: none"> • One example is cost avoidance due to statutory non-compliance which would both improve the patient experience and reduce fines for BSUH.²²

¹⁶

Preidt, R (2013) *Better Work Environment May Cut Hospital Readmission Rates*

¹⁷

Dijkstra K et al (2006) *Physical environmental stimuli that turn healthcare facilities into healing environments*

¹⁸

Ulrich R, Zimring C, (2004) *The Role of the Physical Environment in the Hospital of the 21st Century*

¹⁹

UK National Ecosystem Assessment (2011)

²⁰

Ulrich R, Zimring C, (2004) *The Role of the Physical Environment in the Hospital of the 21st Century*

²¹

MacLeod D. and Clarke N., (2012) *Engaging for Success: Enhancing Performance through Employee Engagement*

²²

Cdiff and MRSA fines expected to reduce by 60% (conservative estimate) as Grant ward being replaced. Fines avoided due to increased capacity and improved patient flow as we are increasing capacity.

Benefits Realisation

20. Each benefit has an identified 'owner' at a senior level who will take responsibility for the delivery of the benefits.

Ongoing Monitoring

21. The 3Ts team has worked with HaCIRIC to refine and extend its web-based Benefits Realisation ('BeReal') tool, which can be used to track/visually represent progress. (The tool is in beta testing stage and it is hoped that development will continue).
22. As part of Post-Project Evaluation, the Trust will monitor benefits at least annually for two years following final completion of the redevelopment.

Summary

Summary Points	
1.	The Trust has put in place a robust process for the identification, definition and future management of benefits.
2.	A Benefits Realisation Group has been established to provide further rigour to this process during the move from OBC to FBC and into implementation with senior level engagement from clinicians.
3.	The benefits have been monetised following discussions with DH economists.
4.	The Trust has engaged with an academic body – HaCIRIC – to ensure additional rigour in the process.
5.	The Trust is at the forefront of developing approach to benefits realisation at a national level.