

**Trust Board Meeting in Public: Wednesday 11 November 2015**

**TB2015.134**

<b>Title</b>	<b>Outline Business Case for the Replacement of the 16 slice CT scanner with a 64 slice scanner at the Horton General Hospital</b>
--------------	--

<b>Status</b>	For approval
<b>History</b>	Supported by the Business Planning Group at its meeting on 20 <sup>th</sup> October 2015  Supported by the Trust Management Executive at its meeting on 22 <sup>nd</sup> October 2015

<b>Board Leads</b>	<b>Paul Brennan, Director of Clinical Services</b>			
<b>Key purpose</b>	<b>Strategy</b>	Assurance	Policy	<b>Performance</b>

## Executive Summary

1.	<p>The CT scanner at the Horton General Hospital (HGH) requires replacement. This 16 slice CT scanner was installed in 2005. The core function of the 16 slice CT scanner is to provide 24/7 diagnostic imaging for Emergency Department (ED) patients, inpatients and outpatients at the HGH. This is 13% of the Radiology Directorate's overall CT activity.</p> <p>The replacement is required as the existing scanner is nine years old (two years older than the Royal College of Radiologists (RCR) recommended timeline for replacement). The scanner is becoming increasingly unreliable and is of low specification by modern standards.</p> <p>As it is the only CT scanner at the HGH, any downtime leaves the HGH without access to on site CT. Currently, in the event of a breakdown, outpatients are rebooked and all ED and inpatients are diverted to Oxford for imaging, both in and out of hours. This creates an additional increase in demand for CT capacity within Oxford, compounding the already identified CT capacity issues in Oxford.</p> <p>Replacing this scanner will support the overall strategic vision of the Directorate (outlined in the Horton Radiology Strategy (Appendix A)) and Trust to invest in expanding diagnostics capacity at the HGH. This will enable specialised techniques such as Cardiac CT to be performed at the HGH, thus removing the need for patients in the north of the county to travel to Oxford for such procedures. This in turn would also alleviate the pressure on Radiology services in Oxford and the coinciding issues regarding traffic and parking, particularly at the JR site.</p>
2.	<p>It is proposed that the new scanner will be a mid-range 64 slice scanner (that offers 128 slice reconstruction). This scanner would support a modern Radiology department and would provide the following benefits:</p> <ul style="list-style-type: none"> <li>• Improved service continuity and reliability for the CT service across the Radiology Directorate, as a new scanner should have minimal unplanned down-time.</li> <li>• Improved image quality and ability to carry out all <i>current</i> standard requirements for CT diagnostics at the HGH.</li> <li>• Reduction in radiation dose to patients.</li> <li>• The image reconstruction process will be faster, facilitating more rapid review of images by clinical teams and radiologists.</li> </ul>
3.	<p>If this proposal is not approved the existing obsolete CT scanner will become increasingly unreliable. It will also have a number of adverse effects on Radiology and Trust performance measures, including: increased pressure on inpatient bed capacity at the HGH; an increase in cancellations; an increase in the number of breaches of the 4 hour ED target, 6 week and 2 week Cancer and diagnostic access waiting time standards.</p>

4.	<p>The preferred option of the associated feasibility study is <b>Option 2A</b>. This option is for a single storey extension to be constructed on the HGH site, providing a new CT scanner room. The financial implications of the <b>Option 2A</b> are :</p> <ul style="list-style-type: none"> <li>• A capital investment of £939k (it has been confirmed that no VAT will be added to this final cost) to replace the CT scanner, contrast injector pump, image manipulation workstations, PACS storage and patient integral monitoring equipment.</li> <li>• Estates investment of £1,927k to make a small extension to the department to house the replacement CT scanner to maintain service continuity and allow future service expansion.</li> <li>• Total capital investment £2,866k</li> <li>• There is provision for £2,340k in the Capital Programme for this proposal, so an additional £526k funding will need to be identified.</li> <li>• Annual revenue costs will total £192k in 2015/16, rising to £536k in 16/17, reducing to £473k in 2018/19 which includes contribution to overheads, depreciation and capital charges (see financial <b>Appendix B</b> for details).</li> <li>• The additional temporary staffing in 16/17 is mitigated by the reduction of maintenance spend of £89k (associated with warranty). These are both non-recurring.</li> </ul>
	<p><b>Recommendation</b> The Trust Board is asked to approve the allocation of £100k for detailed design and costings to inform the development of the full business case.</p>

**Outline Business Case for the Replacement of the 16 slice CT scanner with a 64 slice scanner at the Horton General Hospital**

<b>Trust Management Executive Reference</b>	<b>TME2015.257</b>
<b>Appendices</b>	<p><b>Appendix A</b> – HGH Radiology Strategy</p> <p><b>Appendix B</b> – Financial Analysis</p> <p><b>Appendix C</b> - Proposed Scheme – Estates construction cost estimate</p>
<b>Background papers</b>	
<b>Action/decision required from Trust Board</b>	Approval of £100k for detailed design and costings to inform the development of the full business case
<b>Strategic Objectives that the case will help deliver</b>	<p><b>SO1</b> - To be a patient-centred organisation, providing high quality, compassionate care with integrity and respect for patients and staff – <b>“delivering compassionate excellence”</b></p> <p><b>SO2</b> -To be a well-governed organisation with high standards of assurance, responsive to members and stakeholders in transforming services to meet future needs - <b>“a well-governed and adaptable organisation”</b></p>
<b>Proposed date that revenue spend will begin:</b>	April 2016
<b>Proposed date that capital spend will begin:</b>	April 2016
<b>Conclusion of Equality Analysis</b>	The replacement of the HGH CT scanner will provide improved diagnostic accuracy for patients, with lower radiation doses and less downtime due to unreliability. A modern CT scanner will be able to acquire scans more quickly improving the experience of all staff and patients. The needs of disabled patients have been addressed in choice of machine. The replacement of the HGH CT scanner will also support the strategic vision for the HGH.
<b>Review Date</b>	September 2016
<b>Acronyms and abbreviations used</b>	<p>CSSD – Clinical Support services Division</p> <p>CT – Computerised Tomography</p>

	<p>ED – Emergency Department</p> <p>HGH – Horton General Hospital</p> <p>OCCG – Oxfordshire Clinical Commissioning group</p> <p>OUH – Oxford University Hospitals</p> <p>PACS – Picture Archive and Communication System.</p> <p>RCR – Royal College of Radiologists</p>
<b>Authors</b>	<p>Mrs Toni Mackay - OSM Diagnostics</p> <p>Mr Andrew Robinson - Superintendent Radiographer HGH</p> <p>Dr Fiona Macleod - Clinical Lead for Radiology HGH</p> <p>Ms Charlotte Wilson - Diagnostics Business and Performance manager.</p> <p>Ms Lauren Buckley – Divisional Business and Performance Manager, CSS Division</p>
<b>Lead Finance Manager</b>	<p>Ms Doreen Carter - Senior Finance Business Partner, CSS Division</p> <p>Mr Colin Goodall – Diagnostics Business Partner, CSS Division</p>
<b>Lead Estates Manager</b>	<p>Mr Muz Khan, Project Manager</p>

## 1. Strategic Context and Case for Change

### Overview and Current Usage

- 1.1. The CT service at HGH is currently provided by one 16-slice GE CT scanner. In 2013/14 the HGH CT service performed 7371 CT examinations, supporting ED, inpatients and outpatients referred from the north of Oxfordshire. This equates to 13% of the Trust's overall CT activity.
- 1.2. The HGH CT service has been growing by about 8% per year, with activity increasing by 36% in the last 4 years alone.

Year	Activity
2010/11	6037
2011/12	6494
2012/13	6864
2013/14	7371
2014/15	8213

- 1.3. It is predicted that activity will continue to increase at the HGH. CT activity is increasing nationally at 10.3% per annum (KH12 stats). In Oxfordshire, CT activity has increased by 10% in 2013-14. Given the trend in national activity increases it is estimated that HGH CT activity will have increased to 13,200 scans per annum by 2019/20.
- 1.4. The CT scanner is now a routine diagnostic tool and it must be available 24/7 to support ED, all inpatient and outpatient referrals within HGH. This includes Oncology, ED, ITU and urgent inpatient referrals requiring immediate access to CT to enable prompt diagnosis and treatment.
- 1.5. All other CT scanners within the Trust have been upgraded to a minimum of 64-slice technology. The existing 16 slice CT scanner has become technologically obsolete and is increasingly unreliable with age.
- 1.6. The Horton 16 slice CT scanner was installed 9 years ago. The RCR advise that the recommended life span of a CT scanner is 7 years. The current CT scanner is of increasing concern due to age, availability of parts and system reliability. This is especially pertinent as it is the only CT scanner at the HGH.
- 1.7. Currently, the agreed process for when the HGH CT scanner breaks down is for patients to be diverted to Oxford. Recently, unplanned downtime at the HGH coincided with a CT breakdown at the JR site. These breakdowns led to multiple patient cancellations, a backlog of imaging requests from ED, and delays in scheduled appointments for both inpatients and outpatients. This subsequently resulted in multiple breaches of the 4 hour ED target, 2 week and 6 week Cancer and diagnostic access targets. This unplanned downtime also had a significant impact on the ambulance service, as patients requiring CT were transferred to other CT services in Oxford which struggled to absorb the CT work from the HGH.
- 1.8. The CT service at the HGH is currently staffed to operate Monday to Friday 9am to 5pm. The service images approximately 30 patients per day, with 12 patients on

average arriving from ED or as an inpatient. In addition, a 24/7 on call and out of hours service for emergency and urgent inpatients is available.

- 1.9. Replacement of the current machine with a new CT scanner will dramatically improve local access to CT imaging at the HGH. The new scanner will enable cardiac patients to be imaged at HGH. This is currently only available in Oxford requiring patients to travel. This is estimated to be 7 patients a week which will be transferred from Oxford and is in line with the HGH strategy.
- 1.10. The new CT scanner will also increase the pneumocolon capacity at the HGH from 12 to 20, patients a week. Pneumocolons are part of the bowel cancer pathway. This is currently occurring to accommodate work load distribution during the replacement of the JR CT scanner, reducing the number of patients travelling to Oxford for this service. To expand capacity further to meet future demand the service will need to open 7 days a week. A separate business case is being developed to increase staffing levels at HGH to achieve this.
- 1.11. This case therefore seeks approval to develop a full business case for capital and revenue funding to replace the existing 16 slice CT scanner at the HGH, with a 64 slice mid-range CT scanner (with 128 slice reconstruction capability) and associated enabling works to support a modern Radiology Department at the HGH and the strategic vision of the HGH as outlined in the Horton Radiology Strategy.
- 1.12. The Horton Radiology Strategy supports the gradual modernisation and expansion of infrastructure and equipment of the HGH's diagnostic facilities, in line with the Trust's strategic goal to facilitate a diagnostic treatment centre in the north of Oxfordshire. This would in turn support the repatriation of patient activity from the south to the north of the county.

### ***Issues with the Current CT scanner***

Equipment age and reliability:

- 1.13. The 16 slice CT scanner at the HGH was installed nine years ago. It is presenting an increasing risk to service continuity at the HGH, due to its age, availability of parts and overall system reliability. From March 1st 2014 to October 1st 2015 there have been 114.5 hours of unplanned downtime, including two overnight closures of the HGH CT service. This approximates to 307 patient appointments cancelled or re-scheduled, delaying imaging for ED, inpatients and outpatients, increasing the pressure on CT services across the Trust.
- 1.14. This sudden loss of CT services due to system breakdown at the HGH has a major impact on ED and the ambulance service. Within ED critical staff and portable life support equipment are removed from ED as patients are transferred to Oxford. The Ambulance service is required to transport these patients at short notice, reducing their ability to respond to other emergencies. This extends the time from admission to CT diagnosis, in turn delaying clinical management and potentially reducing survival rates in critically ill patients. There is also an associated delay in discharging patients, as inpatients experience delays and extended waits for necessary imaging.
- 1.15. If the current CT scanner at the HGH is not replaced, further and potentially irreparable breakdown of the equipment would have a critical impact across the Trust. This would specifically have an adverse impact on inpatients, ED patients, patients awaiting imaging on acute wards, paediatric patients, adult high dependency and critical care patients and patients awaiting imaging on the cardiac wards.
- 1.16. There is insufficient capacity at the three hospital sites in Oxford to deliver sustainable CT services without a CT scanner at the HGH. Without a CT scanner located at the

HGH there will be no imaging for ED or inpatients and a reduction of Trust capacity of approximately 30 patients per day would develop. This would affect the overall Trust achievement of the 2 and 6 week diagnostic target, delaying diagnosis and subsequent clinical management of HGH inpatients, possibly increasing morbidity rates across the Trust.

#### Technology Limitations:

- 1.17. CT technology has improved rapidly since the 16 slice CT scanner was installed at the HGH. The current generation of mid-range CT scanners has larger detectors and greater slice capability, which gives much better image quality and faster scan times.
- 1.18. The 16 slice CT scanner at the HGH is no longer fit for purpose, particularly for imaging patients in the following categories; trauma, vascular and paediatric imaging. This is because in comparison with modern mid-range CT scanners:
  - The image quality is poor
  - Scan time and image reconstruction is slow
  - Multiplane reformatting (axial, sagittal, coronal) is manual, increasing the time from examination to review compared to modern scanners.
- 1.19. The 16 slice CT scanner cannot perform procedures such as visualisation of coronary arteries, blood perfusion studies, CT fluoroscopy to aid localisation of lesions during biopsies and drainage procedures. Diagnostic CT imaging to support these procedures can only currently be performed in Oxford.

#### Justification for 64 slice Technology (128 slice reconstruction):

- 1.20. A clinical specification has been completed for a new CT scanner at the HGH, based on the patient cohorts and cardiac/trauma work that the CT scanner will be required to support at the HGH. This includes provisions made for increasing CT scanning capacity for cardiac patients and pneumocolon patients that could be scanned at the HGH rather than in Oxford. Many medical procedures demand the image resolution of 64 slice technology as a minimum. Pneumocolon studies for 2WW, perfusion studies and cardiac CT imaging will benefit significantly from the ability to reconstruct images to 128 slice reconstruction, by providing more detailed images (e.g. fine blood vessels in the heart or vital organs). This will improve diagnostic efficiency and subsequent clinical management of these patient cohorts.
- 1.21. CT has been the highest source of medical radiation exposure in the UK. To mitigate the radiation risk many advances in CT technology have concentrated on reducing radiation doses to patients, which is especially critical for paediatric patients and those requiring repeat scans. In modern CT technology significant dose reduction has been achieved (up to 50%) through software development. This allows scans to take place at lower radiation doses, with reduced contrast levels, yet provides high quality images. This dose reduction software is not currently available on the HGH scanner and is an important feature of the replacement scanner.

#### ***Operational Risks Associated with Current Service Provision***

- 1.22. The following risks with regard to current CT service provision at the HGH have been identified:



## Clinical risks:

- 1.23. 16 slice CT scanners are no longer considered modern technology as CT imaging has progressed and evolved over the past 10 years. The CT service at HGH is a vital part of the CT service capacity across the Trust. Therefore the continued use of obsolete CT technology creates a risk to the provision of clinical services at both HGH and Oxford based services. This is realised each time the scanner breaks down and would be disastrous in the event of irreparable break down. In this event ED patients, along with all other patients, would need to be diverted to Oxford.
- 1.24. This will cause delays on the throughput of inpatients from ED and acute wards and paediatric and adult critical care patients would also be affected. Breakdown of the current CT scanner at the HGH will also delay diagnosis and subsequent clinical management of the patient's clinical condition and could result in increased morbidity and mortality in some cases. Prompt discharge of some patients will also be delayed if they are only awaiting CT diagnostic imaging to complete their inpatient stay.
- 1.25. The current 16 slice CT scanner has limited clinical capability and cannot be used for imaging required for some services, for instance, detailed cardiac CT scans, due to poor image resolution.

## Operational risks

- 1.26. The CT scanner at the HGH is becoming increasingly unreliable due to the age of the scanner and availability of spare parts. These concerns have the potential to increase unplanned down time and the amount of patient cancellations at the HGH.
- 1.27. During downtime, any urgent/emergency CT scans are transferred or diverted to Oxford. This means increased workload for the emergency ambulance service and depleted staffing of ED and wards due to the provision of escorts to accompany the patients from the HGH to Oxford. This in turn increases the pressure already observed on CT capacity and ED in Oxford.
- 1.28. Compromises to patient safety and hindered discharge processes will also be observed, increasing the pressure on and demand for inpatient beds across all hospital sites across the Trust. This is a particular problem during the winter months when there is a significant increase in demand across the Trust.
- 1.29. Patient experience will be adversely affected due to unplanned delays in diagnostic imaging which ultimately has the potential to delay diagnosis and treatment.

## Financial risks

- 1.30. Failure of the existing CT scanner at the HGH would require a high cost interim mobile service at £2.5k per day (no VAT as it is a managed service) which would equate to £70k a month to accommodate outpatient diagnostic imaging. In addition, there will be costs associated with the transportation and escort staff requirements to Oxford from the HGH for inpatients. Mobile scanners are not suitable for inpatients due to having to travel outside and emergency support issues, particularly for emergency resuscitation.
- 1.31. Reduced capacity will result in failure to meet the agreed Trust performance targets such as the 6 week diagnostic target. The penalties imposed by OCCG for this failure could amount to approximately £200 per patient breach. Without a service at the HGH this would equate to 600 patients a month equating to £120k.

## 2. Objectives and Benefits-Realisation Criteria

2.1. The following aims have been identified. These aims have been established with regard to the Horton Radiology Strategy (Appendix A) and the ongoing service continuity of Radiology services across the Trust:

- Optimise service continuity and reliability for the CT service across the Radiology Directorate.
- Offer improved image quality to provide greater diagnostic accuracy at the HGH.
- Reduce radiation dose to the patient by a minimum of 50% whilst improving image quality, now possible due to manufacturer software development.
- Minimise the risks of unplanned equipment downtime, by increasing maintenance service contracts to include 24/7 cover. This is currently being discussed with service providers.
- Improve flexibility of service delivery and patient pathway by use of the modern mid-range CT capability enabling the full range of CT investigations to take place at the HGH. This includes the provision of Cardiac CT imaging.
- Support the improved delivery of national access standards and internal access standards, avoiding financial penalties.

## 3. Options

3.1. The following options have been considered in establishing this business case in conjunction with the estates feasibility project.

- **Option 1 – Scanner is replaced in its existing location.** Continuity of service is provided by a mobile scanner parked on the hard-standing in the car park to the front of the Radiology department at the HGH. This would require the hire of a manned mobile CT scanner for approximately 15 weeks, at a cost of £315k. The existing pad would be used, which is located in an unsuitable site for inpatient access. The temporary mobile service would therefore only be suitable for outpatient ambulant access. All inpatients and ED would still have to be redirected to CT scanners in Oxford as per the current downtime procedure. There would be no emergency out of hours cover. This option is not recommended due to the risk assessment of the mobile scanner outlined below.
- **Option 2 – Scanner is replaced on a “like for like” basis (16 slice CT scanner).** This option is not recommended given these scanners are now obsolete and the implications for efficient and effective imaging. A replacement for a like for like CT scanner would continue to have an adverse effect on imaging techniques offered at HGH for procedures such as cardiac CT. This would also incur the same operational issues outlined in Option 1.
- **Option 2a - This is the preferred and recommended option** based on cost and the ability to maintain a consistently high level of patient care during installation, as the issues outlined in Option 1 and 2 would not occur. A single storey extension is constructed on the HGH site, providing a new CT scanner room whilst the existing scanner continues to operate in its current location. On completion of this construction, the existing scanner is removed and the area previously occupied by the scanner is refurbished. Option 2a would provide a future opportunity to place an additional scanner at the HGH, which would be subject to a separate business case.
- **Option 3 – Temporary CT scanner is installed in the adjacent X-ray room,** allowing continuity of service whilst the existing scanner is decommissioned and replaced.

This Option is not recommended as the room is too small currently and would therefore require building works, including asbestos removal.

- **Option 4** – CT scanner is replaced in its existing location whilst continuity of the service is provided by relocating the service to the JR in Oxford. This option is not recommended as there would be no CT service provision for ED, inpatients or outpatients at the HGH site during the replacement period and this would place increased pressure on CT services at the JR.
  - **Option 5** – CT scanner is replaced in its existing location. Continuity of service is provided by creation of a new mobile pad and the subsequent placement of a mobile scanner truck parked at the rear of the HGH Radiology Department following the demolition of blocks 10 and 15. In line with the operational issues of Option 1, this is not recommended due to the constraints around the use of a mobile scanner, which would still present an issue.
  - **Option 6** - Demolition of Blocks 10 and 15. Construction of new Radiology Department and Sterile Services Unit. This Option is not recommended due to the high cost of the build.
  - **Option 7 – Do Nothing.** This is not recommended for consideration as the existing scanner is unreliable and the Radiology Directorate will be unable to maintain a CT service at the HGH without a replacement scanner.
- 3.2. When considering all the options above, a critical factor was the need to ensure CT service continuity at the HGH, and across the Trust during installation of the new CT scanner at the HGH. This supports and aligns with the strategic direction of the HGH Radiology Strategy. Where options did not meet this requirement, or meet the aims stated above, these options have been discounted.
- 3.3. The Trust has also conducted a risk assessment around the use of a mobile pad on the HGH site. This is not advisable as the current mobile site is located on the far side of the HGH ED car park. The risk assessment has highlighted the following points, which would also be present if the mobile pad was repositioned:
- CT patients would have to traverse the car park and be exposed to the elements.
  - No changing or toilet facilities available, raising privacy and dignity issue.
  - Significant moving and handling issues for non-ambulant patients accessing the trailer using a tail lift.
  - Not suitable in terms of access for bed bound patients or large ED/Radiology patient trolleys. Therefore patients would have to be transferred to a special trolley, increasing manual handling.
  - Staff and patient risks associated with lone working out of hours would be of significant concern.

#### 4. Option Appraisal using Benefit Criteria

4.1. The following table summarises the extent to which the necessary benefits of the replacement CT scanner are delivered by each option:

	Option 1	Option 2a	Option 3	Option 4	Option 5	Option 6
Replacement of CT scanner with 64 slice technology	Y	Y	Y	Y	Y	Y
Maintenance of local access for inpatients during project	N	Y	Y	N	Y	Y
Maintenance of local access for outpatients during project	Y	Y	Y	N	Y	Y
PACS network, UPS and ventilation /Cooling upgrade	Y	Y	Y	Y	Y	Y
Provision of space for second CT scanner and support accommodation	N	Y	N	N	N	Y
Need for high cost mobile CT hire	Y (£262,500)	N	N	N	Y (£262,500)	N
Estimated total capital cost for estates work	(£909,845)	(£1,927,261)	(£1,292,617)	(£909,845)	(£2,734,792)	(£34,621,337)
<b>Total</b>	<b>£1,172,345</b>	<b>£1,927,261</b>	<b>£1,292,617</b>	<b>£909,845</b>	<b>£2,997,292</b>	<b>£34,621,337</b>

#### 5. Recommended Option 2a and how it meets the case for change

5.1. Option 2a would be the preferred option to accommodate the replacement of the current CT scanner at the HGH and the associated estates work. This option would ensure a localised 24/7 CT service that accommodates ED, inpatients and outpatients at HGH. It avoids the high costs of CT mobile hire and provides space for a future replacement without interruption to current service provision of CT imaging at the HGH. Option 2a provides future expansion space with demand for CT services set to continue to increase.

- 5.2. Whilst Options 3 and 4 are cheaper than 2a, they do not provide any additional space and there is a limit to the technical ability of temporary scanners, which would have an adverse effect on capacity and imaging at the HGH. In addition, Option 4 does not provide continuity of service and risks to the overall provision of CT services across the Trust with regard to capacity would be realised.
- 5.3. There are two options for the procurement of the proposed new CT scanner:
  - **Capital purchase** (used to model indicative costs below and in the financial analysis in Appendix B)
  - **Lease**
- 5.4. It has been confirmed by the procurement team that the Trust has secured the CT scanner through the NHS Supply Chain based on a capital purchase cost. It has been confirmed by Procurement that the CT scanner is reserved at the price quoted and that includes the contrast pump and insufflator.
- 5.5. The preferred procurement approach would be to purchase the equipment through the NHS Supply Chain to ensure value for money.
- 5.6. In the long term it may be possible to include the new CT scanner into a Trust wide Radiology Managed Equipment Service (MES). This work is ongoing and would be subject to a separate business case that is currently in development and would not impact the immediate and urgent need for replacement of the current CT scanner at the HGH.
- 5.7. The procurement team has confirmed that the estates works can be procured through the following methods:
  - **A tendering process** – open tender to specialist builders with NHS and Radiology experience.
  - **Turnkey** – provided through the chosen manufacturer of the CT scanner.
  - **Measured Term Contract (MTC)** – building works provided through the Trust's building provider.

## 6. Financial Analysis of Preferred Option (See also Appendix B)

### *Revenue Costs*

- 6.1. The replacement CT scanner will result in an increase in associated maintenance costs of £1k p.a. (including equipment and PACS maintenance). This cost will not be incurred until 2017/18, one year after the proposed installation in 2016/17 as there is a 1 year manufacturer's warranty on the CT Scanner following installation.
- 6.2. As identified in the recent JR CT installation there will be a small agency requirement to expand the service on the other sites to absorb some work during the build. This is required as staff will be running the HGH CT scanner extended sessions to accommodate displaced work from Oxford.
- 6.3. The additional temporary staffing in 2016/17 is mitigated by the reduction of maintenance spend of £89k (associated with manufacturer's warranty), which is non-recurring.
- 6.4. There are a number of Group 3 items which need to be purchased as part of these developments. These include chairs and tables for waiting rooms, patient trollies, computers, clocks, phones etc. These have been estimated to cost £100k.

- 6.5. Additional recurring estates costs are estimated by HGH operational estates to be £40k. This is based on the recent ultrasound estates cost and is due to a larger building footprint (30sqm) which will require cleaning, maintenance and heating. In addition there will be maintenance costs of new cooling and UPS equipment. This is subject to further confirmation from estates when exact equipment purchased is known.
- 6.6. The main savings from installing the proposed CT scanner will only be realised by not incurring maintenance costs for the first year after installation of the new CT scanner. There may be potential to sell the existing CT scanner (£45k) but this is not confirmed nor has been included within the financial analysis.

### **Capital Costs**

- 6.7. The estimated equipment costs is £939k (it has been confirmed that no VAT will be added to this final cost) to replace the CT scanner, contrast injector pump, image manipulation workstations, PACS storage and patient integral monitoring equipment.
- 6.8. The estimated estates cost is £1,927k to make a small extension to the department to house the replacement CT scanner to maintain service continuity and allow future service expansion.
- 6.9. The total capital requirement would therefore be £2,866k
- 6.10. There is provision for £2,340k in the Capital Programme for this proposal, so an additional £526k funding will need to be identified

### **Cost of Capital**

- 6.11. Based upon £2,866k capital expenditure; depreciation and capital charges will have a maximum charge of £294k (full year effect) falling to £273k by 2020/21.

### **Income**

- 6.12. This proposal is not associated with a predicted increase in activity but will ensure that current activity is managed more efficiently and effectively. It will also ensure that future increases in activity can be accommodated within a modern Radiology Department at the HGH.

## **7. Market Assessment (including commissioner discussions)**

- 7.1. CT services are routinely provided diagnostic tests on all hospital sites across the Trust. CT is a fundamental diagnostic tool for acute surgical, medical and trauma patients and often determines the next diagnostic procedure or course of treatment required. The CT service increases year on year by approximately 10%, with peak activity above this level over the winter months.

## 8. Benefits Realisation

8.1. The table below shows the quantifiable benefits of the proposal and the plan for achieving them.

Benefit	Performance Measure	Current Value	Target Value	Target Date
Service Continuity	Reduction in downtime and number of patient cancellations.	HGH has had 114.5 hours unplanned downtime over the last 20 months.	Reduced downtime and patient cancellations.	01/08/2016
Enable the full range of CT investigations at the HGH.	All CT scans can be performed at the HGH	Current 16 slice CT scanner at HGH cannot perform all types of CT scans.	Full flexibility	01/09/2016
Improved diagnostic image quality	Comparison of image quality with current facilities within Radiology	Current image quality not comparable with 64 Slice equipment	Comparable image quality	01/09/2016
Reduction in radiation dose to patient.	Average radiation dose levels given to patients	Current radiation dose average	40% reduction in average radiation dose	01/09/2016

## 9. Management of Risks of Implementation of Proposal

9.1. The table below lists the risks that would remain if the proposal is agreed and outlines the steps that will be taken to manage them.

Risk	Impact (I)	Likelihood (L)	Total (IxL)	Mitigating Action	Residual Risk	Contingency plan to address risk
Maintaining service continuity, particularly for inpatients and ED. Approximately 600 patients per month would need to be re-	5	5	25	Option 3. Expand Radiology department to continue full service during development.	10	Continuity will be maintained  Additional sessions to scan the remaining displaced out-patients are possible at the Churchill.

booked. There is insufficient capacity across CT (Trust wide) to absorb the total activity and patient type workload from the HGH.						If CT breaks down capacity will be found on other sites for emergencies.
Completing project to anticipated timescale	3	3	9	Project team meetings. Review against plan. Corrective action taken to address slippage.	2x3=6	If project overruns – current scanner will be required longer (It is vital that the project stays on track due to risks highlighted above).
Completing project within allocated budget	2	2	4	Contingency within budget for addressing unforeseen building issues. Estates project management – for this there will be an estates project manager who will hold fortnightly meetings with the supplier and contractors, as has been the case in the current JR CT replacement project.	2x1=2	None identified



## 10. Project Management Arrangements

10.1. The project team and responsibilities can be seen in the table below. The project will be managed and monitored through regular meetings and completion of the Divisional project Implementation Plan. This is discussed at the monthly CSS Divisional Business Planning Group.

Name and Job Title	Responsibilities
Mr Muz Khan - Estates Project Manager	<ul style="list-style-type: none"> <li>• Coordinate meetings</li> <li>• Liaise with external contractors and service users</li> <li>• Ensure there is no scope creep</li> </ul>
Ms Jane Edwards - Procurement Advisor	<ul style="list-style-type: none"> <li>• Procurement of the CT Scanner</li> <li>• Contract negotiation</li> <li>• Sale of current CT scanner</li> </ul>
Ms Claire Ridgeon - CT Modality Lead	<ul style="list-style-type: none"> <li>• Ensure CT service provision remains constant throughout the directorate</li> </ul>
Mr Andrew Robinson - PACS liaison with responsibility for HGH	<ul style="list-style-type: none"> <li>• Ensure the CT build does not adversely affect other service provision.</li> <li>• On site project lead and liaison.</li> </ul>
Ms Tracey Condon - CT Superintendent HGH	<ul style="list-style-type: none"> <li>• Expert CT advice and HGH project liaison</li> </ul>
Ms Toni Mackay - OSM Diagnostics	<ul style="list-style-type: none"> <li>• Overall responsibility for service delivery</li> <li>• Project maintenance and escalation / feedback to the Division</li> </ul>

## 11. Implementation Plan

Action	Timeline
Business Case approved by CSS DME	December 2014
Outline Business Case supported by the TME	October 2015
Outline Business case approved by Trust Board	November 2015
Full Business Case approved by Trust Board	January 2016

Pre-installation works start on site	April 2016
Works completed on site	September 2016
Commissioning completed	September 2016
Room brought into operational use	October 2016

## 12. When and how will the impact and intended effect be reviewed and reported on?

12.1. The impact and intended effect of the replacement CT at the HGH will be assessed 6 months post installation of the new CT scanner.

## 13. Conclusion

13.1. From the information presented in this Business Case it can be seen that existing CT scanner at the HGH requires replacement. Option 2a is the recommended option and would ensure a replacement CT scanner that is fit for purpose is procured. The replacement CT scanner will reduce the clinical and operational risks that currently exist.

## 14. Recommendation

14.1. The Trust Board is asked to approve the allocation of £100k for detailed design and costings to inform the development of the full business case.

**Paul Brennan**

**Director of Clinical Services**

**November 2015**

Prof Fergus Gleeson – Divisional Director, Clinical Support Services

Dr Suzie Anthony - Clinical Director - Radiology Directorate

Dr Fiona Macleod - Clinical Lead for Radiology HGH

Mr Andrew Robinson - HGH Radiology Manager

Ms Toni Mackay - OSM Diagnostics

Ms Charlotte Wilson - Business and Performance Manager Diagnostics

**Business Planning Group: 9<sup>th</sup> March 2015**

<b>Title</b>	<b>Horton Estates and Equipment Replacement Strategy for Radiology Services</b>
--------------	---

<b>Status</b>	For discussion
<b>History</b>	Strategy developed to support the requirement for investment in the replacement of radiology equipment principally at the Horton General Hospital

<b>Board Lead</b>	Dr Suzie Anthony, Clinical Director, Radiology & Imaging			
<b>Key purpose</b>	<b>Strategy</b>	Assurance	Policy	<b>Performance</b>

## Executive Summary

1. Capital investment was made in 2014 in the refurbishment of the ultrasound facilities at the Horton General Hospital. This investment in equipment and facilities was the first of a number of developments which the HGH Radiology Service needs to make in order to sustainably deliver the service. Currently there is an urgent need to replace the general x-ray room at the HGH. It is recognised that significant capital investment is required to support the future delivery of the service. As such this paper sets out the future equipment and estates strategy for Radiology Services at the Horton General Hospital.
2. The Horton Radiology estate is over 40 years old; asbestos is present in most areas. The recently completed ultrasound development, highlighted the presence of asbestos within the department as well as air conditioning, power and shielding provision that did not meet current building regulations and legislation.
3. Approximately 25% of referrals made to the OUH relate to patients living in the North of Oxfordshire (with the HGH currently receiving c.17% of these referrals). To support this expanded patient referral base and provide a diagnostic centre for the North of Banbury significant investment is required over the next five years.
4. This capital equipment investment is estimated to cost £9.5 million plus VAT (total 11.4 Million- excluding estate development). This includes investment of 5 million to install a refresh an MRI scanner and second CT scanner. This is due to an increase in workload of 10% and reorganising patient flow to improve local access for patients. These capital costs are sources from the suppliers.
5. It is recognised that a phased approach would be required across the next 10 years starting with the replacement of the general x-ray room and flooring and CT scanner replacement in 2014/15. With the expansion in equipment, increased patient numbers etc. there will almost certainly be a need for additional space, reconfiguration / reorganisation of the service areas and accommodation for more staff.
6. **Recommendation**  
It is recommended that approval is given to :
  - The urgent development of a business case to replace the X-ray equipment and the flooring, in room 3 at the HGH
  - Estates are commissioned to identify the indicative costs of the enabling works associated with the implementation of this strategy

**Horton Estates and Equipment Replacement Strategy for Radiology Services**

**1. Background**

- 1.1. The Horton site has been developed in stages since early 1900. The Radiology Department at the Horton is situated in estate which is approximately 40 years old. It offers local services to patients living in the north of the county. These services include CT, MRI, US (obstetric and non-obstetric), plain film, Mammography and Fluoroscopy.
- 1.2. Overall Horton activity has risen by 7% over the last three years (with an increase from 70,000 to 75,000 exams performed on site). There has been no additional capacity provided at the Horton to accommodate this.
- 1.3. In February 2014, the Medical Director of the OUH stated that the Trust was committed to investment in the services at the Horton. This would enable the continuing provision of financially and clinically stable modern services to the local community, including 24/7 support services, highlighting diagnostics. Further investment is therefore required at the Horton.
- 1.4. The examinations performed can be split into modalities; the table below shows overall activity for the OUH and percentage performed at the Horton. This highlights the importance of the capacity provided at the HGH. This workload could not be absorbed by the Oxford based service.

Table 1 – Analysis of Current Activity - Total OUH and HGH

Modality	OUH Activity 13/14 (No. of scans)	HGH Activity 13/14 (No. of scans)	HGH Referrals as a % of Trust Activity
CT	56,861	7,372	13.0
MRI	39,205	957	2.4
Fluoroscopy	11,003	823	7.5
Mammography	7,772	1,252	16.1
Plain film	259,244	46,195	17.8
Ultrasound	72,513	11,526 + 6,914 Obstetrics	14.5
Total	446,598	75,039	16.8

1.5. In order to maintain a service at the Horton some aspects of the Radiology department have been modernised. In 2005 the CT suite was developed and more recently the ultrasound development was completed in 2014. Work is also on going to develop the CT suite further. This highlighted the fact that advances in technology have meant that current estate has insufficient power & cooling and no longer meet building regulations such as Medical Electrical Installation Guidance and Notes (MEIGaN). This is in addition to the presence of asbestos in the building, which is costly to remove.

## 2. Equipment

- 2.1. Table 1, as previously outlined, shows the activity taking place at the Horton, by modality. Overall the equipment at the Horton is past the age recommended for clinical use by the Royal College of Radiologists (RCR). Using equipment of this age results in a number of potential risks relating to image quality, maintenance and provision of spare parts. This is in addition to increasing manual handling issues with staff due to the lack of assisted movement.
- 2.2. A recent audit has highlighted that out of 21 pieces of equipment, only 8 have replacement dated in the future. The other 13 pieces of equipment need replacing as soon as possible as their recommended clinical lifespan has been exceeded. This will require considerable investment, estimated at £5 million just for equipment over the next 10 years. In addition to this there is a £2.5 million required for additional CT and MRI installations, plus estate costs to add to these capital costs. Due to the asbestos, electrical and ventilation works required this has proved costly in a recent development.
- 2.3. Appendix 1 shows the equipment at the Horton that needs replacing and a phased approach to that based on RCR guidelines. There is also a second grid which shows additional equipment that will be required based on activity assumptions.
- 2.4. From Trust statistics it is estimated that 25% of all patients referred are from the north of Oxfordshire. To support local imaging of these patients (assuming case mix /follow up clinics are provided) there would need to be some development of the diagnostic infrastructure. In addition to activity increase as a result of referral numbers there will also be an increase in activity to changes in practice. For example the directorate in conjunction with cardiology wish to provide cardiac CT at the Horton, there is also a need to increase Colon examination capacity. Replacement is essential as recently downtime the current CT scanner has had 58.5 hours of down time (within working hours) in 14/15 financial year. This causes major disruption to the Horton site, as emergency patients (ED and IP) have to be diverted to Oxford. A second CT scanner at the Horton would enable increased service provision and stability, as well as expanding capacity.
- 2.5. Currently the MRI is provided through the ISTC and it is predicted in the future that an OUH MRI scanner should be installed at the Horton. From assessing postcode distribution of patients and adjusting for case mix, it has been estimated that approximately 2000 patients travel to Oxford for an MRI that could be accommodated at the local hospital. Another addition to the Horton site would be DEXA. ISTC currently have a mobile scanner coming to the Horton to image patients. The Oxford service is at capacity. This provision would provide local bone

densitometry and increase OUH capacity to facilitate compliance with NICE guidelines i.e., DEXA as part of the prostate pathway.

2.6. In addition the Breast surgeons are increasing their sessions at the Horton, which is already impacting on the mammography service, with the implementation of guide wire localisations in January 2015, this is happening in the Mammography suite. It is also noted that within OUH Ultrasound there is also a shortage of MSK capacity, despite appointment of additional consultants. Job planning and room availability has resulted in patients still being sent to Oxford for MSK imaging. This is due to an increase in the number of 2WW patients and breast work.

### 3. The Estate

3.1. The increase in overall equipment required within the Horton department will result in an increased estates requirement. Options for provision could include expansion and redesign of the current facility, although this is limited and would impact on service provision, building on the demolished site of old nursing accommodation Nuffield House (the Director of Development and the Estate has indicated this would be difficult to quantify as there is no estate strategy available) The third option considered is the use of the ISTC space should that be repatriated within OUH. This would provide additional estate albeit detached from the main unit. The equipment would however still need to be replaced due to age.

3.2. It is noted that in 2013 a 6 facet survey was conducted by estates which is required as a minimum standard for the NHS Estate CODE and includes: Physical Condition Survey, Statutory compliance Audit, Space Utilisation audit, Functional suitability Review, Quality Audit and Environmental Management Audit.

3.3. As a result of this we have been advised that the Director of Development and the Estate is developing plans for each site, but these have not yet been released into the public domain.

### 4. Future Development

4.1. An estimate of activity in 10 years time (using national KH12 documentation of annual increases – 10% ) and assuming that 25% of patients would be treated at the HGH has been modelled below to show the predicted investment and timeline for this. This can be seen below:

Table 2 – Investment by Modality

Modality	HGH activity 13/14	Predicted HGH activity in 10 years	Future capital investment	Time line for investment.
CT	7372	12,000	2 CT scanners	14/15 CT replaced 15/16 CT 2 installed
MRI	957	1500	1 MRI scanner	15/16 MRI installed
Fluoroscopy	823	1300	1	14/15 replaced.

			Fluoroscopy unit	
Mammography	1252	1900		Replaced 18/19
Radiology	46195	68,300	Current rooms replaced plus one addition room	14/15 room 3 replaced 15/16 room 2 replaced 16/17 ED replaced 17/18 additional room
Ultrasound + Obstetrics	11526 + 6914	28610	4 Current machines replaced Two additional machines	14/15 1 additional unit 15/16 replace 4 16/17 1 additional unit
DEXA		1370	1 additional Machine	15/16 machine

4.2. A further detailed analysis can be seen in appendix 1. This highlights all HH equipment, and the cost of replacement at current prices (excluding VAT).

## 5. Conclusion

5.1. This paper outlines a strategy for the future of Radiology Services at the HGH. It considers the opportunities to expand the referral base for the HGH, by repatriating patients referred from the north of the county back to the HGH. It estimates the investment in equipment (the investment required in infrastructure is currently unknown), that would be required to meet across the next 10 years, assuming that HGH is developed to provide a comprehensive radiology service to patients from North Oxfordshire.

**Author: Suzie Anthony**



	Baseline/budget						Proposal							
	2015/16 WTE	2015/16 WTE	2016/17 WTE	2017/18 WTE	2018/19 WTE	2019/20 WTE	2020/21 WTE	2015/16 £000s	2015/16 £000s	2016/17 £000s	2017/18 £000s	2018/19 £000s	2019/20 £000s	2020/21 £000s
<b>A. Direct revenue costs</b>														
<b>Staff (specify grade &amp; wte)</b>														
Consultants	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
<i>Sub total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Junior Medical														
<i>Sub total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Nursing														
<i>Sub total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Scientific & Therapeutic Radiographers			2.00							62				
<i>Sub total</i>	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0	0	62	0	0	0	0
Other Clinical CSW			1.00							15				
<i>Sub total</i>	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0	0	15	0	0	0	0
Non Clinical Reception / Appointments														
<i>Sub total</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
<b>Total Staff</b>	<b>0.00</b>	<b>0.00</b>	<b>3.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>77</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Non-Staff (inc VAT)</b>														
Accommodation costs														
Maintenance Costs 10% Scanner plus IT								98	98	9	77	99	99	99
Equipment consumables														
<b>Total non staff</b>								<b>98</b>	<b>98</b>	<b>9</b>	<b>77</b>	<b>99</b>	<b>99</b>	<b>99</b>
<b>Total Direct Revenue costs</b>	<b>A</b>							<b>98</b>	<b>98</b>	<b>86</b>	<b>77</b>	<b>99</b>	<b>99</b>	<b>99</b>
<b>B. Indirect revenue costs</b>														
<b>Staff (specify grade &amp; wte)</b>														
Radiological Sciences														
<i>Sub total</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
Pharmacy														
<i>Sub total</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
Therapies														
<i>Sub total</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
Laboratory Medicine														
<i>Sub total</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
Theatres/Anaesthetics														
<i>Sub total</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
Critical Care														
<i>Sub total</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
Others														
<i>Sub total</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0
<b>Total Staff</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Non Staff (please insert lines and descriptions)</b>														
Radiological Sciences								0	0	0	0	0	0	0
Pharmacy														
Laboratory Medicine														
Theatres/Anaesthetics														
Critical Care														
Equipment servicing														
Revenue set up costs (e.g. IT, Furniture, fittings etc)										100				
Outpatient costs														
Estates & Facilities (e.g. energy & maintenance)										30	40	40	40	40
Others														
<b>Total non staff</b>								<b>0</b>	<b>0</b>	<b>130</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>
<b>Total Indirect Revenue costs</b>	<b>B</b>							<b>0</b>	<b>0</b>	<b>130</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>
<b>C. Capital Expenditure</b>														
CT Scanner									864	0	0	0	0	0
PACS									75					
Estates building costs									1,927					
<b>C. Capital Expenditure</b>	<b>C</b>							<b>0</b>	<b>0</b>	<b>2,866</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>D. Capital Charge &amp; Depreciation</b>	<b>D</b>							<b>69</b>	<b>69</b>	<b>250</b>	<b>294</b>	<b>287</b>	<b>280</b>	<b>273</b>
<b>E. Trust Overheads</b>	<b>E</b>							<b>25</b>	<b>25</b>	<b>70</b>	<b>62</b>	<b>64</b>	<b>63</b>	<b>62</b>
<b>F. TOTAL REVENUE COST</b>	<b>F</b>							<b>192</b>	<b>192</b>	<b>536</b>	<b>473</b>	<b>489</b>	<b>481</b>	<b>473</b>
<b>Trust Overheads</b>														
(usually 15%)														

Activity & Income

G. Activity (specify HRGs)	Baseline/ budget	Proposal	2016/17	2017/18	2018/19	2019/20	2020/21
	2015/16	2015/16					
A & E attendances		0	0	0	0	0	0
Emergency HRGs		0	0	0	0	0	0
		0	0	0	0	0	0
Subtotal emergency	0	0	0	0	0	0	0
Elective HRGs		0	0	0	0	0	0
		0	0	0	0	0	0
Subtotal elective	0	0	0	0	0	0	0
Day Case HRGs		0	0	0	0	0	0
		0	0	0	0	0	0
Subtotal daycase	0	0	0	0	0	0	0
Outpatient new		0	0	0	0	0	0
Outpatient follow-up		0	0	0	0	0	0
Subtotal outpatient	0	0	0	0	0	0	0
Other		0	0	0	0	0	0
Other		0	0	0	0	0	0

H. Income	£000s	£000s	£000s	£000s	£000s	£000s	£000s
A & E attendances							
Emergency HRGs							
Elective HRGs							
Day Case HRGs	0	0	0	0	0	0	0
Outpatient new							
Outpatient follow-up							
Other							
MRET Adjustment							
Subtotal NHS	0	0	0	0	0	0	0
Private Patient							
R&D							
Other non NHS clinical							
Charitable Funds							
Other							
<b>Total Income</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Analysis of income by Specialised/Non-Specialised Commissioner

The following table is to indicate changes to current Commissioner income flows. If future years will alter significantly from this please make clear reference in your business case narrative. For non-specialised services, please analyse by CCG.

2016/17 Source of Income	Activity					
	A&E	Spells			OP- New/Fup	Other
		Emergency	Elective	Day case		
Commissioner						
Sub total NHS/PCT	0	0	0	0	0	0
Private Patient						
R&D						
Other non NHS clinical						
Charitable Funds						
Other						
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

2016/17 Source of Income	Income						Total
	A&E £000s	Emergency £000s	Spells			Other £000s	Other £000s
			Elective £000s	Day case £000s	OP- New/Fup £000s		
Commissioner							0
					0		0
							0
							0
							0
							0
Sub total NHS/PCT	0	0	0	0	0	0	0
Private Patient							0
R&D							0
Other non NHS clinical							0
Charitable Funds							0
Other							0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

SUMMARY

	Baseline/ budget						Proposal						Baseline/ budget		Proposal	
	2015/16 WTE	2015/16 WTE	2016/17 WTE	2017/18 WTE	2018/19 WTE	2019/20 WTE	2020/21 WTE	2015/16 £000s	2015/16 £000s	2016/17 £000s	2017/18 £000s	2018/19 £000s	2019/20 £000s	2020/21 £000s		
<b>A. Direct revenue costs</b>																
<b>Staff</b>																
Consultants	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Junior Medical	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Nursing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Scientific & Therapeutic	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0	0	62	0	0	0	0	0	0
Other Clinical	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0	0	15	0	0	0	0	0	0
Non Clinical	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
<b>Total Staff</b>	<b>0.00</b>	<b>0.00</b>	<b>3.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>77</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Non-Staff</b>								98	98	9	77	99	99	99	99	99
<b>Subtotal Direct costs</b>	<b>A</b>	<b>0.00</b>	<b>0.00</b>	<b>3.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>98</b>	<b>98</b>	<b>86</b>	<b>77</b>	<b>99</b>	<b>99</b>	<b>99</b>	<b>99</b>
<b>B. Indirect revenue costs</b>																
<b>Staff</b>																
Radiological Sciences	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Pharmacy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Therapies	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Laboratory Medicine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Theatres/Anaesthetics	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Critical Care	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Others	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
<b>Total Staff</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Non Staff</b>								0	0	130	40	40	40	40	40	40
<b>Subtotal Indirect costs</b>	<b>B</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>130</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>
<b>C. Capital Expenditure</b>	<b>C</b>							0	0	2,866	0	0	0	0	0	0
<b>D. Capital Charge &amp; Depreciation</b>	<b>D</b>							69	69	250	294	287	280	273	273	273
<b>E. Trust Overheads</b>	<b>E</b>							25	25	70	62	64	63	62	62	62
<b>F. TOTAL REVENUE COST</b>	<b>F</b>							<b>192</b>	<b>192</b>	<b>536</b>	<b>473</b>	<b>489</b>	<b>481</b>	<b>473</b>	<b>473</b>	<b>473</b>
<b>H. Income</b>																
Total NHS								0	0	0	0	0	0	0	0	0
Private Patient								0	0	0	0	0	0	0	0	0
R&D								0	0	0	0	0	0	0	0	0
Other non NHS clinical								0	0	0	0	0	0	0	0	0
Charitable Funds								0	0	0	0	0	0	0	0	0
Other								0	0	0	0	0	0	0	0	0
<b>Total Income</b>	<b>H</b>							<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>SURPLUS (DEFICIT)</b>								<b>-192</b>	<b>-192</b>	<b>-536</b>	<b>-473</b>	<b>-489</b>	<b>-481</b>	<b>-473</b>	<b>-473</b>	<b>-473</b>

INCREMENTAL SUMMARY

	Baseline/ budget						Baseline/ budget						Proposal	
	2015/16 WTE	2015/16 WTE	2016/17 WTE	2017/18 WTE	2018/19 WTE	2019/20 WTE	2020/21 WTE	2015/16 £000s	2015/16 £000s	2016/17 £000s	2017/18 £000s	2018/19 £000s	2019/20 £000s	2020/21 £000s
<b>A. Direct revenue costs</b>														
<b>Staff</b>														
Consultants		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Junior Medical		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Nursing		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Scientific & Therapeutic		0.00	2.00	-2.00	0.00	0.00	0.00	0	62	-62	0	0	0	0
Other Clinical		0.00	1.00	-1.00	0.00	0.00	0.00	0	15	-15	0	0	0	0
Non Clinical		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
<b>Total Staff</b>		<b>0.00</b>	<b>3.00</b>	<b>-3.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>77</b>	<b>-77</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Non-Staff</b>								0	-89	68	22	0	0	0
<b>Subtotal Direct costs</b>	<b>A</b>	<b>0.00</b>	<b>3.00</b>	<b>-3.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>-12</b>	<b>-9</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>B. Indirect revenue costs</b>														
<b>Staff</b>														
Radiological Sciences		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Pharmacy		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Therapies		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Laboratory Medicine		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Theatres/Anaesthetics		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Critical Care		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Others		0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
<b>Total Staff</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Non Staff</b>								0	130	-90	0	0	0	0
<b>Subtotal Indirect costs</b>	<b>B</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>130</b>	<b>-90</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>C. Capital Expenditure</b>	<b>C</b>							0	2,866	-2,866	0	0	0	0
<b>D. Capital Charge &amp; Depreciation</b>	<b>D</b>							0	181	44	-7	-7	-7	-7
<b>E. Contribution to Corporate Overheads @ 15%</b>	<b>E</b>							0	45	-8	2	-1	-1	-1
<b>F. TOTAL REVENUE COST</b>	<b>F</b>							<b>0</b>	<b>344</b>	<b>(63)</b>	<b>17</b>	<b>(8)</b>	<b>(8)</b>	<b>(8)</b>
<b>H. Income</b>														
Total NHS								0	0	0	0	0	0	0
Private Patient								0	0	0	0	0	0	0
R&D								0	0	0	0	0	0	0
Other non NHS clinical								0	0	0	0	0	0	0
Charitable Funds								0	0	0	0	0	0	0
Other								0	0	0	0	0	0	0
<b>Total Income</b>	<b>H</b>							<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>SURPLUS (DEFICIT)</b>								<b>0</b>	<b>-344</b>	<b>63</b>	<b>-17</b>	<b>8</b>	<b>8</b>	<b>8</b>
<b>Contribution</b>								<b>0</b>	<b>0</b>	<b>118</b>	<b>-99</b>	<b>22</b>	<b>0</b>	<b>0</b>

# BUDGET ESTIMATE NO.6 OPTION 2A REV D

## FEASIBILITY



Please note that this Estimate is a preliminary cost based upon outline sketch proposals and is subject to change during the detailed design stages.

Project Number	2014.062	Capital Programme Capital Code: 3235	
Project Name	Horton CT Replacement Feasibility Option 2A-Single storey extension is constructed, providing a new scanner room whilst the existing scanner continues to operate. On completion, the existing scanner is removed and the area previously occupied by the scanner is refurbished.	Outturn 13/14	£0
Project Option		Allocation 14/15	£0
Project Manager	Muz Khan	Total	£0
DATE:	20.10.15 (updated inflation figure)	Charitable Fund	£0
Work Stage	Feasibility	Overall Capital Programme Allocation	£0

Procurement Strategy MTC therefore no allowance for prelims

NOTE: Costs do NOT include the following: Cost for supply and installation of new CT scanner or removal of existing scanner. Any scanner hire or transport costs. Storage costs. Any loose furniture and items such as phones, computers, clinical or medical equipment, curtains etc. Maintenance costs for any plant or fixed equipment.

Cost per m2 (£/m2)

m2 cost based on HPCG's plus allowances for abnormalities

Initial Estimate base docs	Sweet Feasibility Report No. 3 dated 23rd December 2014	Notes/ Qualification
<b>Construction</b>	%	£
Construction costs		£826,233 Includes £10,000 asbestos removal
Roof repairs		£5,000

<b>Sub-Total</b>		<b>£831,233</b> Excludes: Construction Contingency
Construction contingencies	10.00%	£83,123
<b>Total Construction Costs</b>		<b>£914,356</b> Includes: Construction Contingency

**Professional Fees (VAT 100% recoverable)**  
% based upon MTC11 dated 05.01.2009

Stage 0-1 Feasibility Costs-Sweet		£5,156
Stage 0-1 Feasibility Costs-GBS		£11,452
Sweet Group Stage 2-8	1.4%	£11,837
GBS ( Method) M&E-Stage 2-8	3.7%	£30,756
GBS -Architectural-Stage 2-8	4.5%	£37,405
GBS CDM-C	1.0%	£8,312
GBS Structures	1.6%	£13,300
Survey Fees (Est)		£1,500
Ventilation AP (Est)		£2,500
Ventilation AE(Est)		£1,000
Medical Gas AE ( Est)		£1,000
Medical Gas AP(Est)		£2,500
Medical Gas Testing (Est).		£1,000
Electrical AE(Est)		£1,000
Electrical AP(Est)		£1,000
Operational Estates ( Est)		£1,000
Capital Programmes (Est)	5.0%	£41,562
Travel expenses		£500
OHIS Installation ( Est)		£1,000
Building control fees ( Est)		£1,500
Planning Fees (Est)		£1,500
Approved Air validation		£2,000

**Total Fees** £178,580 Includes: Design, Professional, Building Control, Planning and Survey Fees

### Non Works Costs

Storage Costs (est)		
Moves and Decant Costs (est)		
Clinical Clean (Est)		£500

**Sub-Total** £500 Includes: Trust Signage, Cleaning, Trust Project Team and Decant Costs.

### Group 2 ( Supplied by Client and fitted by Contractor) & 3 Equipment (Loose equipment)

Computercenter Active IT Equipment		£25,000
Fire Extinguishers ( Est)		£500
Masson Seeley signs		£2,500
Soap dispensers etc (Est).		£500
<b>Sub-Total</b>		<b>£28,500</b>

**Sub-Total** £1,121,936 Includes: Total Construction, Professional Fees, Non-Works and Group 2&3 Equipment Costs

### Planning Contingencies

Assumed 10% of Total Construction Cost 10.00% £112,194 Applied to Sub-Total. Includes: Cost Overruns not contained within building contract contingencies, claims for disruption and loss and expense, cost overruns on equipment budget, claims for additional professional fees

**Total Cost.** £1,234,130

### Optimism Bias

Estimated % of Overall Construction and Contingencies Cost 18.81% £232,140 Applied to Total Cost. Includes: changes to scope of project incl. for example developments in national policy, changes in local priorities and strategies, changes in medical technology, changes in how services are delivered.

Inflation From Q2 2014 to Q2 2016, BCIS PUBSEC inflation index provided by Sweett 14.99% £219,794 Cost at date of issue

VAT % (Excluding Fees) 20.00% £301,497 Applied to Total Construction, Non-works, Group 2 & 3 Equipment, Planning Contingency, Optimism Bias and Inflation Costs

Recoverable VAT 20.40 or 75%. 20.00% £60,299 No independent objective assessment of VAT abatement has been undertaken

**Total Scheme Cost** £1,927,261

£1,012,905 Rev.C: Inflation adjusted following discussion MK John Kelly-21.05.15 Cost difference between construction costs inc contingency and final cost.