

Reporting to:	Trust Board - 27th November 2014
Title	Business Case: The modernisation of CT Scanners in order to support service transformation and increased productivity
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Previously considered by	CPG; Radiology Board Meeting; Trust Operational Risk Group
Executive Summary	<p>The Radiology Department at RSH has a single CT scanner which is at end of life. Recently it has broken down several times which has increased patient length of stay, caused the cancellation of outpatient appointments and caused delays in the scheduling of patients treatment regimes.</p> <p>The technology is out of date and as a direct impact on patient throughput. This can be measured by a direct comparison with the newer CT scanner at PRH. This has a direct correlations to the available capacity of the service.</p> <p>The Trust could loose potentially £2.75 million income if the CT scanner is not replaced at this present time and a second CT scanner is not procured to meet the shortfall in demand. The alternative to the replacement of a CT scanner is to site a mobile scanner in the car park of RSH. This would require all emergency patients and inpatients who require a CT scan to be transported out of the hospital to the car park.</p> <p>The outcome from a Demand & Capacity Radiology Service Review on the back of the Cancer Service Review by the Intensive Support Team identified aged equipment and shortfall in the CT capacity to meet service requirements. The recommendations were to replace the CT scanner with up to date technology and the implementation of a second CT scanner to meet service demands. This matches the Trust's strategic priority to modernise equipment, supporting service transformation and increase productivity through the use of technology.</p>
Strategic Priorities	
1. Quality and Safety	<input type="checkbox"/> Reduce harm, deliver best clinical outcomes and improve patient experience through our Quality Improvement Strategy
2a) Healthcare Standards: Operational Performance Standards	<input type="checkbox"/> To develop a transition plan, with supporting mitigation actions and contingency plans, that ensures the safety and short term sustainability of challenged clinical services. 2014/15 <input checked="" type="checkbox"/> To address the existing capacity shortfall and process issues to consistently deliver national healthcare standards. 2014/15 <input type="checkbox"/> To undertake a review of all current services at specialty level to inform future service and business decisions. 2015/16
2b) Healthcare Standards: Service Reconfiguration	<input type="checkbox"/> Complete and embed the successful reconfiguration of Women and Children's services
3. People and Innovation	<input type="checkbox"/> Develop a sustainable long term clinical services strategy for the Trust to deliver our vision of future healthcare services through our Future Fit Programme <input type="checkbox"/> Develop our leaders and promote staff engagement to make our organisation a great place to work through our People Strategy <input checked="" type="checkbox"/> Develop a robust Investment Strategy to modernise our equipment and estate to support service transformation and increase productivity through the use of technology)
4 Community and Partnership	<input type="checkbox"/> Embed a customer focussed approach and improve relationships with our GPs through our Stakeholder Engagement Strategy

5 Financial Strength: Sustainable Future	<input type="checkbox"/> Develop a transition plan that ensures financial sustainability and addresses liquidity issues pending the outcome of the Future Fit Programme
Board Assurance Framework (BAF) Risks	<input type="checkbox"/> If we do not deliver safe care then patients may suffer avoidable harm and poor clinical outcomes and experience <input type="checkbox"/> If we do not implement our falls prevention strategy then patients may suffer serious injury <input type="checkbox"/> Risk to sustainability of clinical services due to potential shortages of key clinical staff <input checked="" type="checkbox"/> If we do not achieve safe and efficient patient flow and improve our processes and capacity and demand planning then we will fail the national quality and performance standards <input type="checkbox"/> If we do not have a clear clinical service vision then we may not deliver the best services to patients <input type="checkbox"/> If we do not get good levels of staff engagement to get a culture of continuous improvement then staff morale and patient outcomes may not improve <input checked="" type="checkbox"/> If we are unable to resolve our (historic) shortfall in liquidity and the structural imbalance in the Trust's Income & Expenditure position then we will not be able to fulfil our financial duties and address the modernisation of our ageing estate and equipment
Care Quality Commission (CQC) Domains	<input checked="" type="checkbox"/> Safe <input type="checkbox"/> Effective <input type="checkbox"/> Caring <input type="checkbox"/> Responsive <input type="checkbox"/> Well led
<input type="checkbox"/> Receive <input type="checkbox"/> Review <input type="checkbox"/> Note <input checked="" type="checkbox"/> Approve	Recommendation The Trust Board approves the replacement of the unreliable CT scanner in RSH and the requisition of a second CT scanner to address the capacity shortfall and repatriation tertiary referrals back into SaTH.

Business Case:
**The modernisation of the CT Scanners in
order to support service transformation and
increased productivity**

Care Group: Radiology
Centre: Radiology
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Date: 18/11/2014

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1. Executive Summary

The CT Service at RSH is a critical part of the SaTH Trauma Unit and Emergency Department. It is also essential to the management of in-patients' care throughout the hospital. The CT service is an integral part of the diagnostic pathway for patients on the cancer pathway, 18 weeks referral to treatment pathway and 2 week referral pathway. It is also essential for patients for whom other diagnostic tests such as colonoscopy, nuclear medicine and barium enemas are not suitable for their conditions. 26,651 scans were performed on the RSH CT scanner in 2013/14.

Over recent months the 8 year old CT scanner has broken down several times and on some occasions for multiple days, impacting patients' services and causing appointments to be cancelled with some patients having to be transferred to PRH. This has a direct affect on the multiple targets that the Radiology department and the Trust are measured against. Examples include A&E waiting times, trauma targets, In-patient length of stay, cancer patients requiring planning scans and the national 6 week diagnostic wait target. The life expectancy of a CT scanner is 8 years and the CT scanner is so fundamental to the functioning of the services within SaTH that it now urgently requires replacing.

Demand for CT referrals has increased 13% year on year over the past 3 years. Nationally it is 18%. To address this increase the CT scanner is now run 7 days a week. This has exacerbated the unreliability of the scanner and increased the time the equipment takes to reconstruct examinations. The service reports showed that the scanner carried out 18 months worth of activity in 12 months. Recent demand and capacity work has identified shortfall of 33 hours of scanning time which are required to meet the demand. It was identified at the time of the Surgical Reconfiguration that there would be a requirement for a second CT scanner to meet service requirements.

The replacement of the present CT scanner and the procurement of a second CT scanner is supported by the Trusts strategy of developing a robust investment plan to modernise our equipment and estate in order to support service transformation and increase productivity through the use of technology.

2. Document Purpose

The primary purpose of this business case is to request the Trust Board's approval to replace the present unreliable CT scanner at RSH and to purchase a second scanner in the Radiology Department at RSH. The second scanner will address the shortfall in capacity identified in the demand and capacity work undertaken with the support of Intensive Support Team (IST). This scanner will enable the segregation of the Elective out-patients, oncology and cardiac services, from the Acute Services. This will also eliminate the constant interruption of the outpatient's lists by emergency scans. An integral part of the provision of a second scanner is to provide a dedicated changing area and cannulation room for elective CT patients. These facilities will greatly improve patient experience within Radiology, patient dignity and patient flow through the department.

A modern technologically advanced replacement is required which can optimise patient throughput utilising increased speed of examinations and flexibility of service. This will also provide increase efficiencies by offering a wider range of examinations. It will reduce radiation dose exposure levels significantly whilst delivering high quality imaging for speedy and accurate clinical diagnosis. The second scanner will also provide back up for the main scanner during downtime thus ensuring continuity of service.

The CT project will provide the Trust with a service at RSH which is fit for purpose for a busy Acute District General Hospital which includes a Trauma Centre. The CT scanners will provide the latest technology which will improve diagnostic confidence, patient flow and the ability to repatriate

tertiary referrals back to SaTH. It will also provide the ability to be more responsive to demand due to service changes and national requirements for cancer targets and national health promotion campaigns. The new technology will allow for Cardiology service development within the Trust enabling NICE guidelines to be met for Chest Pain patients.

Part of this project will be funded by a donation from the RSH CT scanner charitable fund.

The proposal and recommendations in this service development are supported by Clinicians and staff throughout the Trust. They perceive the updating and expansion of the CT service as essential and enabling for patient flow and the Trust meeting its national targets.

3. Current Service Profile

3.1 Background

The CT scanner is a fundamental part of the Radiology Service. Activity has increased year on year for the last three years by 13% across all specialties. This has put increased workload pressure on an ageing piece of equipment. This has been compounded by the moving to 7 day working and extended days to support service demand and provide additional capacity.

The CT scanner is no longer reliable and staff have changed their working practices not to improve efficiencies but in order to keep the scanner functioning without breaking down. This is putting additional stress on the staff who are already working under pressure due to increased service requirements. The increased frequency of the breakdowns was the catalyst for undertaking a risk assessment. This risk assessment scored a 20 on the risk analysers and was escalated to the Radiology Board and then to the Trust Operational Risk Group. The score was upheld at both Groups. The outcome action was to present a paper to the Capital Planning Group in October to request a replacement CT scanner and approval for a second CT scanner to address the capacity short fall.

3.2 Current Service Profile and Operational Challenges

The present scanner is end of life and is technologically challenged. The increasing length of time it takes to reconstruct the examinations is having a detrimental effect on patient flow and on patient experience. This is because the patients have to lie for an increased period of time on the CT couch whilst the images reconstruct and the CT tube cools down. This increases the time taken to report a CT scan and reduces the productivity of the Consultant Radiologists.

These delays have a detrimental affect on Radiology's existing capacity shortfall and impede their ability to meet National healthcare targets. It also impacts on the quality of the service Radiology can provide to patients.

The CT service has already been rejected by a private insurance company to provide CT examinations for their patients due to the age of the scanner.

The repeat breakdowns of the system have caused the department to cancel patients' appointments and send patients home who are awaiting their scan.

The CT scan couch has a limited weight capacity of 21 stones. Due to the demographic increase in the weight of patients this has lead to some patients being refused a scan as the conditions of the maintenance contract would have been breached. In that instance the Trust would be liable for the full cost of any repairs to the CT scanner and the scanner would not be functional.

The present footprint of the CT service does not provide any areas of privacy for patients. There is no dedicated patient changing facilities or areas for the patients to wait when they are changed into gowns. It is a challenge for the staff to maintain a patient's dignity in these surroundings.

4. Current Risks

1) Risk	2) Impact	3) Risk Mitigation	4) Like hood after mitigation	5) Consequence after mitigation	6) Mitigating Score.
1. Type: IT Corporate, Strategic, Quality, Workforce, Infrastructure followed by summary	Detail of the impact		1. Rare 2. Unlikely 3. Possible 4.Likely. 5. Almost certain	1. Insignificant 2. Minor 3. Moderate 4. Major 5. Catastrophic	Column multiplied by column 5
Quality	Frequent breakdown of the CT scanner has a negative impacts on patients length of stay and on out patients waiting times if their management of care is dependent upon a CT scan	Regular QA checks. Use the Radiotherapy scanner for the limited number of scans that can be carried out on it. Transfer patients to the CT scanner at PRH if necessary. This is short term has it has an impact on the CT capacity at PRH.	5	4	20
Quality	Delays in the Cancer patients planned pathway	Prioritising these patients for appointments has soon as the CT scanner is back up and running	5	4	20
Quality/Trust Strategy	CT reconstruction time increased due to the age of the equipment. This leads to patients remaining on the CT couch longer than should be required. This provided poor patient experience and poor patient flow.	Schedule appointments so that patients who require CT heads are not booked together to allow the CT scanner to reconstruct the images. This is a difficult task and not always possible as a CT head is the most common referral from A&E and AMU. Staff work 7 days a week and extended days to spread the workload	5	4	20
Quality	Lack of capacity prevents the CT Department to be flexible in its approach to changes in service demand. This can	The Radiologists are vetting the request cards to make sure that referrals are suitable.	4	4	16

	lead to a delay in patient's appointments.				
Quality	The single CT scanner does not allow for the segregation of Acute patients from elective patients. This leads to a delay in elective patients appointments has emergency scans have priority over outpatient scans	The staff communicate with patients to make them aware of the cause of any delay. In patients are now booked at a different time of the day to outpatients where possible	5	3	15

5. Drivers For Change

5.1 External Factors Driving Service Change

- RCR guidelines for the replacement of a CT scanner are 8 years. The CT scanner at RSH is end of life the increased demand on its use is having a negative impact on its reliability.
- The new CT scanner will have specifications that will provide the capability of scanning patients with high BMI. At present these patients require a tertiary referral or excluded from having a CT scan.
- The present CT scanners do not have the capability to meet the new service requirements of Cardiology and Oncology. Additional capacity will also be required for these service requirements.
- There will be a direct negative impact on A&E; In Patients and cancer patients if the CT scanner is not replaced
- The 6 week diagnostic waiting target will be breached if the scanner is not replaced.
- Private Companies are not referring patients to SaTH due to the age of the equipment.
- The lack of CT capability has been called into question by the Cancer Services Commissioners.

5.2 Internal Factors Driving Service Changes

- New CT scanners can scan four times as fast as the present scanner with a lower dose of radiation to the patient.
 - In 2013/14 26,651 examinations were performed on the CT scanner at RSH. Evidence shows that this activity is increasing year on year. If the CT scanner is not replaced there will be a potential loss of income around £2.75 million.
 - At present 'like for like' maintenance costs are £20K more for the present scanner due to aged technology and limited demands for parts.
- IST Demand & Capacity model using 2013/14 capacity identified a deficit of 33 hours per week in 2014/15 this includes the 8hours per week required for the cardiac service to meet NICE guidelines for Chest pain referrals. In SaTH there has been a 13% increase in referrals year on year for the past 3 years.
- If the second scanner is not approved a cost of a mobile CT scanner for period of the project this will cost the Trust £160,000.

5.3 Summary of the Drivers for Change

- The Trust will lose its status has a Trauma Centre
- The Trust's will fail its strategy to consistently deliver national healthcare standards.
- The Trust will fail its strategy to support service transformation and increase productivity through the use of technology.
- The Trust will fail to meet national targets
- The Trust will potentially lose income of approximately £2.75million of income per annum
- The Trust has failed to recruit new Radiologists into vacant posts and had offers of employment rejected due to the age of the equipment.
- The Trust will not have the ability to meet future service demand.

6. Options

The following options have been identified for consideration:

1. Do nothing:
2. Purchase a replacement CT scanner.
3. Purchase a replacement CT scanner and a second scanner to meet the shortfall in capacity and increases in service demands.
4. Purchase a replacement CT scanner this financial year and purchase a second scanner to meet the shortfall in capacity in the next financial year.

The following sections provide a detailed description of each of the above options and a SWOT analysis has been included for each of the viable options.

6.1 Option 1: Do Nothing

Strengths (Pros):

- None identified

Weaknesses (Cons):

- The Trust will not be able to provide a Trauma Service at RSH.
- The Trust will not be able to support an Emergency Department at RSH.
- There will be no reliable CT service at RSH due to the frequent breaking down of the CT scanner.
- There will be no potential increase in income into the Trust due to the unreliable service and age of the equipment (a private insurance company has already stopped referring their patients to RSH), lack of technology and lack of capacity.
- The Trust will fail national targets, such as A&E, cancer, 18 week and the 6 week diagnostic waits due to the unreliability of the scanner causing lists to be cancelled.
- The CT scanner is at end of life and the engineers now have problems replacing it. This is documented in the Scanner Fault Log.
- Like for like maintenance contract for this equipment is greater than for the new equipment due to the age of the technology.

Opportunities:

- None

Threats:

- Failure to provide an Emergency and Acute service.

- Failure for the Trust to meet national targets
- Loss of services to other providers.
- Loss of Cancer Services
- Increases in staff sickness levels due to the stress of working with unreliable equipment.

Conclusion: This option would have serious consequences on patient care and service provision.

6.2 Option 2: Purchase a replacement 64 slice CT scanner

Strengths (Pros):

- Provides an improved service for patients utilising new technology.
- Supports the Trust to meet national targets at this present time with no flexibility for and increase in service demand.
- Improves patient flow and experience. The system is four times faster than the present scanner.
- Improved confidence in the diagnosis of pathology due to the improved imaging quality
- Meets some of the Trust's strategies.
- Improve the ability to recruit staff.
- New Technology means a lower dose of radiation per patient per examination.

Weaknesses (Cons):

- No continuity of service during enabling work as the present CT scanner will have to be removed from site prior to the replacement scanner being installed.
- To maintain the service all patients including A&E, In patients and Out patients will have to be scanned in a mobile CT scanner sited in the patient car park by outpatients. This will cost approximately £104,000 for the duration of the project. All patients will have to go outside 24/7 to have their scan.
- All Doctors will have to view the CT images 24/7 on the mobile unit as there will be no capability of viewing the images on the PACS system as is the present practices. It will take several hours after the scan to view these images within the hospital.
- There is no opportunity to segregate the Acute patients from the Elective patients. Elective patient's appointments are delayed due to emergency scans.
- There is no defined changing area for these patients.
- Charitable funds will not be used to purchase a replacement CT scanner.
- The replacement of the CT scanner does not address the capacity shortfall identified during the demand and capacity exercise undertaken with the Intensive Support Team on the back of the Cancer Review exercise.

Outcome from Intensive Support Team model for CT activity for 2013/14

(This is scan time only and does not include the time taken to get the patients onto the CT scanner and off the CT scanner)

Capacity Requirement (85 th percentile)	4863	81 hours, 3 minutes
Scan Capacity deficit Per week,	Between -668 to -1059 minutes	Between -11 hours, 6 minutes to -17 hours, 45

		minutes
Net weekly waiting list change (based on core capacity)	201 mins less than demand per week	3 hours, 21 minutes
13% scan capacity increase 2014/15 (based on demand data)	Between -736 to -1138 minutes	Between -12 hours, 36 minutes to -16 hours, 48 minutes

Opportunities:

- Potentially the new CT scanner will be able to support service development and the repatriation of tertiary referrals but the limiting factor is the lack of capacity. (see table above)
- Improvement in the recruitment and retention of staff due to new technological equipment.
- The CT scanner has a larger weight capacity, larger diameter bore and a longer CT table than the present scanner. This will enable the repatriation of some of the bariatric patients back into SaTH. It will also decrease the number of patients we have to decline to undertake a CT scan because they are too heavy or large for the present CT scanner.

Threats:

- Inability to respond to changes in service demands due to lack of capacity.
- The Cardiac service can not be repatriated from UHNS into SATH. The NICE guidelines for Chronic Chest Pain Pathway and other cardiac pathways will not be able to be implemented due to the lack of capacity and functionality of this scanner.
- There is no additional capacity to meet the increase in the demand for CT colonoscopies generated as an outcome of age expansion of the Bowel Cancer Screening Programme, bowel cancer patients and those who have failed colonoscopies.
- National directives such as the commissioning of Direct Access for GPs for suspected cancer patients will not be able to be undertaken due to lack of capacity. There is a potential for this service to be commissioned out of county.
- The lack of capacity in the scanner to undertake the increasing demand to scan Cancer patients who are prescribed High Cost Drugs. The impact of which is if the response to the drug can not be documented then the course of that drug will stop. This service could go out of county.
- The Service engineers identified that 18 months worth of examinations had been undertaken on the present CT scanner in 12 months. This had a detrimental impact on the reliability of CT scanner and increased the frequency in the replacement of the CT x-ray tubes. This will not be addressed by the purchase of a replacement CT scanner.

Conclusion: Option 2 addresses the need to replace the present CT scanner but does not provide additional capacity, redundancy and service expansion to cover Cardiology and Oncology Services.

6.3 Option 3: Purchase a replacement 64 slice CT scanner and a second 128 slice CT scanner to meet the shortfall in capacity and increases in service demands

Strengths (Pros):

- The ability to maintain service continuity when the other CT scanner has downtime due to a service, breakdown. This will also eliminate the need to transfer patients to the Radiotherapy Department or PRH to have their scans.
- The CT service will be maintained throughout the enabling project with two CT scanners. There will be no requirements to use a mobile scanner in the car park area of the Trust.
- Provide the capability to segregate Acute sector patients from the Elective sector patients. This will improve patient dignity and with within the Radiology Department.
- Provides the ability to have a CT scanner dedicated to Acute patients, Emergency referrals and In patients. This will improve the response time from the receipt of a request to a scan leading to an improved patient experience and pathway.
- This project would meet the Trust's strategic plans to increase productivity through the use of technology and address existing capacity shortfalls and meet national healthcare targets. It would also address the issue of 18 months worth of activity being scanned in 12 months with the present scanner.
- New Technology means a lower dose of radiation per patient per examination.
- Improves patient flow and experience. The system is four times faster than the present scanner.
- Enable service developments and increase income into the Trust in areas such as Cardiology, Urology and Oncology.
- Opportunity develops the role of advanced reporting CT radiographers which will benefit the reporting capacity in Radiology and reduce the reporting times for CT head scans.
- The availability of new CT technology on the new scanners will improve the opportunity to recruit and retain Radiographic staff.
- The ability to use the money from the RSH CT scanner Charitable Funds to support the purchase of the second CT scanner.
- Improve productivity and efficiency due to the utilisation of the new technology providing faster scan times.
- Optimising the layout of the CT scanners in this project, will allow for one control area for both scanners. The advantages are no additional staff are required to run the additional CT scanner and the old control room will be used as an office for a Duty Radiologists. Implementing this role will improve efficiencies within Radiology in patient flow and increase reporting productivity due to the marked reduction in the number of interruptions the Radiologists experience whilst reporting.

Weakness (Cons):

- Financial implication to the Trust for the Capital outlay.

Opportunities

- The ability to provide a service for patients closer to home and repatriate cardiac and oncology patients back into the Trust. This will lead to an increase of income into the Trust by developing Cardiac and Oncology Services
- Approach the private insurance companies to reconsider their decision not to allow their patients to be scanned at RSH due to the age of the present equipment.

- Provides the ability to a flexible approach to changes in service demand due to National Health Promotion Advertising Schemes, such as 'blood in your urine'.
- The new technology is not workstation based so it provides a much more flexible working environment for Radiologists as these images can be seen on their PCs in both RSH and PRH.
- The CT scanner has a larger weight capacity, larger diameter bore and a longer CT table than the present scanner. This will enable the repatriation of some of the bariatric patients back into SaTH. It will also decrease the number of patients we have to decline to undertake a CT scan because they are too heavy or large for the present CT scanner.

Threats

- At present none have been identified by Radiology.

Conclusion: Option 3 would provide the Trust with a future proof CT service that will be able to respond to changes in national and local requirements. It will have a positive impact on the recruitment and retention of staff to SaTH. It would allow for the running of two scanners without the need to increase staffing levels, utilising the benefits of scale. The conversion of the present control room into a Duty Radiologist's office would improve productivity both with the processing of requests and the increased number of reports that could be undertaken per reporting session. Nationally this has been seen to be up to 30%.

6.4 Option 4: Purchase a replacement 64 slice CT scanner this financial year and independently purchase a second 128 slice CT scanner to meet the shortfall in capacity in the next financial year.

Strengths (Pros):

- As for Option 2
- Once the second CT scanner is installed there will be the capacity to undertake further service expansion, continuity of service, segregated Acute and Elective service, the ability to provide a cardiac service and an improved oncology service.
- New Technology means a lower dose of radiation per patient per examination.
- Improves patient flow and experience. The system is four times faster than the present scanner

Weaknesses (Cons):

- As for Option 2
- This project will require a control area for each scanner. This means that twice the number of staff will be required to run this service compared to option 3 i.e. 6 Radiographers instead of 3 Radiographers.
- There is insufficient floor space in the area at present allocated for the CT scanners to provide two separate control rooms. This will mean that there will be a compromise in patient changing facilities and the injection room.
- Until the second scanner is installed there will be no segregation of Acute and Elective patients.

Opportunities:

- Once the project has been fully completed then additional capacity will be provided to implement service expansion and the repatriation of Cardiac and oncology patients.
- Approach the private insurance companies to reconsider their decision not to allow their patients to be scanned at RSH due to the age of the present equipment.

- Provides the ability to a flexible approach to changes in service demand due to National Health Promotion Advertising Schemes, such as 'blood in your urine'.
- The new technology is not workstation based so it provides a much more flexible working environment for Radiologists as these images can be seen on their PCs in both RSH and PRH.
- The CT scanner has a larger weight capacity, larger diameter bore and a longer CT table than the present scanner. This will enable the repatriation of some of the bariatric patients back into SaTH. It will also decrease the number of patients we have to decline to undertake a CT scan because they are too heavy or large for the present CT scanner.

Threats:

- There are a limited number of scanners with operational packages included that the NHS Supply Chain has bulk bought in order to reduce costs to NHS Hospitals. If there is a delay in ordering the second scanner the NHS Supply Chain will not guarantee the availability of this CT scanner package.

Conclusions:

The purchasing of two CT scanners at different times requires the hire of a mobile scanner to be sited in the car park of RSH in order to maintain the continuity of the service. It will create a compromise in the functioning of the CT scanners due to the limited space available for the 2nd control room. This project although providing the additional capacity identified to meet the present demands and to expand the service will require double the number of Radiographers to run the service. There is a recognised national shortage of Radiographers to be recruited. There is a high potential that a delay in ordering the second CT scanner will compromise the operational package available to the Trust.

7. Options Appraisal – Financial

The table below provides a description of the financial flows as they relate to the four options :

- Do nothing,
- Replace existing CT scanner
- Replace existing CT scanner and purchase a further CT scanner immediately; and
- Replace existing CT scanner and then purchase a further CT separately at some point in the future.

	Do nothing	Purchase 1 CT scanner	Purchase 2 CT scanners immediately	Purchase 1 scanner and then 1 further scanner in the future
	£000's	£000's	£000's	£000's
Capital Cost				
Cost of scanners	Nil	552	1,007	1,322
Enabling work	Nil	239	340	478
Charitable fund contribution	Nil	-	(150)	(150)
Total Capital cost	NIL	791	1,197	1,651
Revenue				

	Do nothing	Purchase 1 CT scanner	Purchase 2 CT scanners immediately	Purchase 1 scanner and then 1 further scanner in the future
	£000's	£000's	£000's	£000's
Consequences				
Revenue cost of Portable solution	(410)			
Maintenance contract		(61)	(80)	(104)
Capital charges		(93)	(164)	(216)
Less Financial savings / Income				
Existing maintenance contract	61	61	61	61
Existing Capital Charges	81	81	81	81
Increased GP Direct Access Income			170	170
Cost of delivering GP Direct Access Income			(51)	(156)
Net Income and Expenditure effect Gain / (Loss)	(266)	(12)	17	(164)

The above table illustrates:

- Do nothing creates a cost pressure to the Trust of £266,000, because in choosing to not replace the existing CT scanner a portable solution would need to be put in place at an annual rental cost of £410,000.
- Replacing the existing CT scanner creates a cost pressure of £12,000, because the existing maintenance charges would continue at the same rate, however the replacement cost of the new CT scanner is greater than the historical cost of the existing CT scanner and so introduces increased capital charge costs.
- Choosing to purchase two CT scanners and implement these scanners simultaneously, creates a financial gain to the Trust of £17,000 per annum. This is so because the increased maintenance contract and capital cost charges are covered through increased income generated within the Radiology Department. The increased income has been based upon the achievement of 40 scans per week at a cost of £85 per scan. This service is being actively requested by General Practices across both Telford and Shropshire, however because of a lack of capacity this is presently not being performed by the Trust. The cost of performing this additional activity is limited to the cost of consumables.
- Choosing to immediately purchase a CT scanner and then supplement this with a further CT scanner in the future is expected to generate a Net Loss of £164,000 per annum. This loss is so because the cost of installing separately two CT scanners is both more expensive to purchase and install. Also the maintenance cost option available in support of the scanners is less attractive. The cost of delivering increased GP Direct Access Income is

greater because the configuration of two separate CT scanners would mean that increased levels of staffing would need to be employed.

The above analysis has not sought to consider income opportunities beyond GP Direct Access as a consequence of having a second CT scanner and hence greater available capacity, this is purposeful because such opportunities require further work. That said, the Trust is presently unable to perform CT scanning diagnostic support to the treatment of Chronic Chest Pain. The existence of enhanced capacity, with associated improved software capability would however make this possible. Performing this form of activity, which is recommended by NICE would generate additional Income of £113,000 per annum. In addition increased capacity would also enable tests that are presently being performed at neighbouring Trusts to be repatriated. The value of this activity is estimated at £50,000 per annum.

The Capital Programme for 2014/15 financial year contains a designated sum amounting to £1.2 million to support the cost of purchasing replacement CT scanners. In the event that the Trust Board were to approve the Business Case, the replacement CT scanners could be installed before 31st March 2015.

8. Workforce Planning

8.1 Recruitment

The Requisition of new CT scanners will support recruitment to the Radiology Department. Previously staff decline Radiology posts due to the age of the CT equipment.

Option 1 - will require no additional staff to run the scanner

Option 2 - will require no additional staff to run the scanner.

Option 3 - will require no additional staff to run the scanner

Option 4 - will require 3 more additional Radiographers to run the two scanners

8.2 Training and Education

Options 3 and 4

Application training is provided as part of the support package by the manufacturers. Staff have already attended cardiac training course to enable them to plan the service requirements. Further training for Radiologists will be required for the Cardiac Scanning. Funds have been identified for research and development and educational training budgets.

At present there is a competency based training programme within Radiology for the Radiographers as part of a recruitment and retention drive. Due to the pressures of the service through one scanner this has been compromised in the past. The new CT scanners will promote staff training and the retention of staff.

9. Options Appraisal: Non-Financial

The options described in this case have been considered and assessed against a set of key outcome indicators and with consideration of the existing risk and residual risk.

1. Do nothing: this is not a feasible option as the equipment needs replacing.

2. Purchase a replacement CT scanner
3. Purchase a replacement CT scanner and a second scanner and including patient changing facilities to meet the shortfall in capacity, increases in service demands and improved service efficiencies, patients' experience and dignity.

The result of this assessment is shown below;

9.1 Key Outcome Indicators

Desired Outcome	Outcome Achieved Y / N			
	Option 1	Option 2	Option 3	Option 4
Quality and Safety (examples)				When complete
Reduce or eliminate existing risks (see below)	N	Reduces not eliminates	Y	Y
Ensure compliance with regulatory quality standards	N	Y	Y	Y
Improve quality and clinical outcomes	N	Y	Y	Y
Improve patient experience	N	Partially	Y	Partially
Long term sustainability of clinical services	N	N	Y	Y
Other.....				
Healthcare Standards (examples)				
Support the delivery of key healthcare targets	N	Partially	Y	Y
Other.....				
Community and Partnership (examples)				
Alignment with the wider Clinical Services Strategy	N	Y	Y	Y
Alignment with local commissioning intentions	N	Y	Y	Y
Other.....				
People and Innovation (examples)				
Alignment with the Trust's 5 Year Workforce Plan	N	Partially	Y	Y
Improve staff health and well-being, recruitment and retention	N	Y	Y	Y
Other.....				
Financial Strength: Future Sustainability (examples)				
Ensure long term viability of services including future development	N	N	Y	Y
Improve efficiency / deliver savings	N	Partially	Y	Y
Increase contribution for future investment	N	N	Y	Y
Funded through existing resources or agreed external funding	N	Y	Y	Y
Other.....				
Number of outcomes achieved	0	8.5	14	13.5

10. Residual Risk

	Option 1	Option 2	Option 3	Option 4
Current mitigated risk score (as per Section 4)				
Description: Frequent breakdown of the CT scanner has a negative impacts on patients length of stay and on out patients waiting times if their management of care is dependent upon a CT scan	5x4=20			
Description: Delays in the Cancer patients planned pathway	5x4=20			
Description CT reconstruction time increased due to the age of the equipment. This leads to patients remaining on the CT couch longer than should be required. This provided poor patient experience and poor patient flow.	5x4=20			
Description: Lack of capacity prevents the CT Department to be flexible in its approach to changes in service demand. This can lead to a delay in patient's appointments.	4x4=16			
Description: Lack of segregation of Acute patients with elective patients leads to a delay in elective patients appointments has emergency scans have priority over outpatient scans	5x3=15			
Residual risk score (after action / implementation)				
Description: Frequent breakdown of the CT scanner has a negative impacts on patients length of stay and on out patients waiting times if their management of care is dependent upon a CT scan	5x4=20	2x4=8	2x4=8	2x4=8
Description: Delays in the Cancer patients planned pathway	5x4=20	2x4=8	2x4=8	2x4=8
Description CT reconstruction time increased due to the age of the equipment. This leads to patients remaining on the CT couch longer than should be required. This provided poor patient experience and poor patient flow.	5x4=20	1x4=4	1x4=4	1x4=4
Description: Lack of capacity prevents the CT Department to be flexible in its approach to changes in service demand. This can lead to a delay in patient's appointments.	4x4=16	4x4=16	1x4=4	4x4=16 1scanner 1x4=4 2 scanners
Description: Lack of segregation of Acute patients with elective patients leads to a delay in elective patients appointments has emergency scans have priority over outpatient scans	5x3=15	5x3=15	1x4=4	5x3=15 1 scanner 1x4=4 2 scanners

11. Stakeholder Engagement

11.1 Key stakeholders who have been involved in developing the case

- Radiology staff
- Emergency Department
- Cardiology Department
- Anaesthetists
- Trust Clinicians
- Oncology Department
- Patients
- Estate Staff
- Infection Control Department
- IT
- Radiation Protection Advisers
- Radiotherapy

- Gastroenterology

11.2 Key stakeholders who will be affected by the proposed change during the enabling work

- Emergency Department
- In-patients wards
- Radiology staff
- Trust Clinicians
- Patients

There is a CT project group who have scheduled meetings which the stakeholders and the suppliers are invited. The minutes of these meetings are produced in the form of an action plan which is accessed on the shared drive.

Operational meetings have included finance and Contracts support alongside the relevant Care Groups. The outcomes of these meetings will include meetings with Commissioners.

12. Preferred Option

Following a full appraisal of both quantitative and qualitative factors the preferred option is:

Option 3

Purchase a replacement CT scanner and a second scanner to meet the shortfall in capacity and increases in service demands.

12.1 Financial Impact Summary

	wte	Recurrent £,000	Year 1 £,000	Year 2 £,000	Year 3 £,000
Income					
Expenditure		(51)	0	(51)	(51)
Contribution		(51)	0	(51)	(51)
Capital Investment					

Note: Above excludes capital charges.

12.2 Non-financial impact: Key Outcome Indicators

- Option 1 delivers 0 of the 14 key outcome indicators identified within the options appraisal:
- Option 2 delivers 8.5 of the 14 key outcome indicators identified within the options appraisal:
- Option 3 delivers 14 of the 14 key outcome indicators identified within the options appraisal:
- Option 4 delivers 13.5 of the 14 Key outcome indicators identified **once both scanners have been installed** within the option appraisal

13. Recommendation

Based on consideration of outcomes required and value for money the Care Group are recommending:

- The present CT scanner is replaced and a second CT scanner is installed with patient changing facilities and a cannulating room as an integral part of the scheme.

14. Post Implementation Review

14.1 Key Performance Indicators

The achieving of the following KPIs will be used to assess the success of the proposal:

- A reduction in 6 week diagnostic waits
- Cancer targets
- 18 RTT
- 2 week referrals
- The repatriation of tertiary referrals to SaTH.
- Patient satisfaction survey and outcomes from the patients' feedback forms
- Staff satisfaction surveys

14.2 Process and framework

The project will be reviewed by Radiology no later than a 3 month period after installation and a full report will be presented to the Capital Planning Group.