

West of Scotland Satellite Radiotherapy Facility

Initial Agreement

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Initial Agreement

1. Title of Scheme

This Initial Agreement (IA) is for the development of a West of Scotland Satellite Radiotherapy Facility, which will work as a satellite of the Beatson West of Scotland Cancer Centre (BWoSCC) to serve the radiotherapy needs of the West of Scotland population.

2. Introduction

This document lays the foundation for the initial proposal and outline costs for the development of a Satellite Radiotherapy Facility in the West of Scotland. This development will be led by the Satellite Radiotherapy Facility Project Board, which will be sponsored by the West of Scotland Regional Planning Group. Radiotherapy services for the West of Scotland are solely provided by the BWoSCC at Gartnavel Hospital, Glasgow. The health boards currently accessing these services at the BWoSCC include NHS Ayrshire & Arran, NHS Forth Valley, NHS Greater Glasgow & Clyde, and NHS Lanarkshire. All Boards have formally confirmed their support for this development.

3. Strategic Context

The BWoSCC is the busiest radiotherapy centre in the United Kingdom and is presently operating at close to maximum capacity. This level of activity is unsustainable and steps need to be taken to increase the available capacity for the West of Scotland population. The majority of cancer patients requiring radiotherapy live in the central belt of Scotland and Government policy is to provide treatment as locally as possible. Notwithstanding this attempts have previously been made to look at opportunities of realignment through the National Pathways and Processes Group (Jan-July 2010). This work explored maximising the current use of the existing 25 LinAcs. The group concluded that if existing machines were operational for 9 hours per day (with an average throughput of 5 fractions per hour) then the lower end of the predicted rise in demand may be met. However, even with an increase to a 10 hour working day it would not be possible to meet the upper end of the predicted demand for radiotherapy with the existing stock of LinAcs across Scotland. There would be safety concerns in operating the machines at higher utilisation levels. The group therefore recommended 3 additional Linear Accelerators required in Scotland to meet a predicted demand on radiotherapy services of 250,000 fractions by 2016.

There is currently some spare capacity within NoSCAN but this will not be enough to support the demand profile of patients going forward. Previous attempts to encourage patients to travel e.g. for PET have been unsuccessful. Any improvement in the overall utilisation of Scotlands capacity would need to be weighed against the acceptability issues for sick patients travelling.

The planning assumptions for the central belt scoping work were based on what the acknowledged additional capacity was going to be at the new facility. It was agreed that this would be 3 new LinAcs – 2 to support current capacity constraints at BWoSCC and 1 to support anticipated future capacity constraints at the Edinburgh Cancer Centre. This determined the number of fractions that would be available at the facility based on an agreed number of fractions per session that could be performed during a set working day.

Current provision for linear accelerators is as follows across Scotland:

Glasgow: 11 linacs

Edinburgh: 6 linacs

Dundee: 3 linacs

Aberdeen: 3 linacs

Inverness: 2 linacs

The linacs in Glasgow and Edinburgh are operated on an extended working arrangement ie. beyond a nominal eight hours per day, with an average of 9.2 hours and 8.25 hours per accelerator respectively. Several linacs in Glasgow operate for 10.25 hours per day. There are no published plans to increase capacity in any of the sites in the east or north of Scotland.

Discussions have taken place with east and north colleagues through the national Radiotherapy Programme Board. The Programme Board has discussed capacity issues and the Board accepts that there is a need for a strategic solution based on the Pathways and Processes work of at least 3 new machines. This national group has signed off the conclusions of the central belt work and agreed with the assumption that a west satellite should be developed. East of Scotland colleagues are currently considering their available options to achieve an increase in capacity. Notwithstanding the agreed analysis that the available capacity would not be enough to meet the demand there are real concerns around the quality of care we would be offering if we were to ask patients to travel for a treatment that can often last several days and leave them feeling unwell.

Consideration was given to the potential opportunity of developing a central belt facility, which could support radiotherapy services provided in both the East and West of Scotland regions. The final report details the work and conclusions of this scoping work and can be found in Annex A. In summary, the group concluded that the concept of a central belt satellite facility is not supported by the work done to date on patient activity and flows and that both regions would now need to progress their own solutions to confront the pressing constraints on radiotherapy services.

The West of Scotland Regional Planning Group considered that a proposal for a satellite radiotherapy facility to support West of Scotland radiotherapy services should be progressed as urgently as possible. Modelling work carried out in the completion of the central belt scoping work demonstrated that 3 LinAcs would be required in the short term to meet the demand for radiotherapy services across Scotland with 2 required for the West population and 1 for the East, however this does not account for any growth in radiotherapy demand post 2017.

The National Radiotherapy Advisory Group (NRAG) Capacity and Efficiency subgroup reported in November 2006 that for a utilisation rate of 85% or 8600 fractionations per LinAc that between 6.2 and 6.5 LinAcs would be required per million population. This equates to a total of 14.88 to 15.6 LinAcs required to meet the needs of the West of Scotland population. Featherstone, Chalmers & Erridge reported in 2010 in their report on remodelling of radiotherapy demand and capacity data that there would be a requirement of between 114000 and 155000 fractionations required to meet the demands of the West of Scotland Cancer Advisory Network (WOSCAN) population by 2015. This equates to between 13 and 18 LinAcs for WoS. Currently the BWoSCC is delivering approximately 115,000 fractionations and with the addition of a 3 LinAc Satellite facility this would bring the total number of fractionations expected to be delivered to approximately 141,000.

With an agreed total number of fractions that would be available, an analysis was carried out to determine the cancer incidence and the resultant radiotherapy demand that occurred within distinct car travel time boundaries of each proposed site. A focus was directed towards the four main tumour sites that generate the greatest radiotherapy demand i.e. Lung, Breast, Prostate and Rectal.

20, 40, 60 and 90 minute car travel time boundaries were analysed round each proposed site. Car travel time was based on normal road driving conditions taking into consideration the roads used to get to each site i.e. motorway, A & B roads, legal speed limits for each road and any road safety measures e.g. traffic lights and speed cameras.

This analysis quickly demonstrated that sufficient demand would be generated within a 40 minute car travel time boundary and for one site a 30 minute car travel time would be sufficient to provide the demand to fill the available capacity. With the development of a solely West of Scotland solution a new analysis will be carried out within the Outline Business Case (OBC) to determine travel times to the BWoSCC and the two proposed sites to determine proximity to each site and the resultant demand that would be generated Those living closest to the new satellite will clearly benefit most and these are much larger populations than those smaller populations that live at a distance.

For example

For Forth Valley Residents (FK11) - 55 mins to Beatson, 15mins to FVRH, 40mins to Monklands and (FK15) - 1hr 5mins to Beatson, 35 mins to FVRH, 55 mins to Monklands.

For Glasgow residents (G33 4) - 25mins to Beatson, 30mins to FVRH, 15 mins to Monklands and (G69 8) - 25mins to Beatson, 25 mins to FVRH, 15 mins to Monklands

For Lanarkshire residents (ML1 5) - 35 mins to Beatson, 40 mins to FVRH, 20 mins to Monklands and (ML5 5) - 25mins to Beatson, 30 mins to FVRH, 10 mins to Monklands.

The postcodes with the longest travelling times are as follows;

Ayrshire & Arran - KA27 8 > 2hrs 10 mins to Beatson, 3 hrs to Larbert and 2hrs 50mins to Monklands

Argyll & Bute - PA77 6 > 7 hrs to Beatson, 7hrs 20mins to Larbert and 7 hrs 5 mins to Monklands

More in depth modelling work based on activity and anticipated growth in incidence across WoS will be completed during the development of the OBC. In particular it will be important to factor in the impact of Detect Cancer Early activity.

4. Strategic Objectives

In addition to the current high levels of demand, there is also a documented projected increase in incidence of cancer in line with an aging population. The national policy context will also have a critical influence on the required development of radiotherapy and cancer services in the region. The Scottish Government has initiated its 'Detect Cancer Early' programme with its central aim of ***'improving 5 year survival rates for people in Scotland diagnosed with cancer'***. The programme will attempt to increase by 25% the number of patients diagnosed in the first stage of cancer. Concentrating initially on the three most prevalent cancers i.e. lung, breast and colorectal cancer it is estimated that an additional 500 patients nationally will be diagnosed with early stage cancer. These patients will require treatment, which will in turn, place additional demand on radiotherapy services. The full impact of detect cancer early is still being quantified.

In addition to the 'Detect Cancer Early' programme, the 'Health Care Quality Strategy' is another major driver, which is underpinning this proposed development. The central pillars of the strategy are to ensure that care is person centred, clinically effective and safe. All of these quality dimensions will be enhanced through this important development.

In addition to the strategic context, it is acknowledged that the proximity of the population to specialist services assists in ensuring greater access and uptake of services, which is of particular benefit for patients from more deprived areas. This service development will improve local access to radiotherapy services for more patients, closer to their home and reduce waiting times for treatment following diagnosis.

5. Investment Objectives

The Central Belt Radiotherapy Scoping Report provides comprehensive details of the current activity and the required business need for this proposed development to support radiotherapy services in the West of Scotland. At this time, no Design Statement as described and anticipated in SCIM guidance and referred to in Table 1 below has been developed for the project. However, through the approval and promotion of this IA, the commissioning boards commit to develop such a statement to a standard agreed by the NHSScotland Design Assessment Process (NDAP) and to do so prior to any decisions being made on sites or any design work carried out. This agreed Design Statement will be embedded in the project governance as if it had been part of this IA and will be published alongside the approved IA.

It is the intention that the required investment will:

- Enable speedy access to modernised and integrated radiotherapy services that will support the achievement of national waiting time standards.
- Improve the convenience of access to radiotherapy services that are patient centred, safe and clinically effective
- Provide improved access to modern planning techniques supporting improvements in clinical outcomes.
- Ensure available radiotherapy capacity is able to meet the anticipated rise in demand
- Achieve a BRE Environmental Assessment Method (BREEAM) Healthcare Rating of Excellent

Service users will see an improvement in the following:

- The patient pathway for access to radiotherapy services
- Access to services both diagnostic & treatment not previously available locally
- Radiotherapy services delivered closer to the patient’s home.

Table 1 sets out the investment objectives, with the associated proposed measures and timescales that the new satellite radiotherapy facility aims to achieve.

Table 1

Primary Objective	Outcome	Measure	Timescale
Ensure available radiotherapy capacity relieves capacity constraints at the West of Scotland Beatson Cancer Centre. Is able to meet the anticipated rise in demand.	Utilisation rate at the West of Scotland Cancer Centre will fall below 90% Maintain utilisation rate at new facility below 90 %. Rise in demand will be accommodated within the 90% utilisation rate	Monitor utilisation rate at the WoS Beatson Cancer Centre and the new satellite facility. Monitor cancer numbers treated at each site to ensure switch of treatment to the new facility	From opening
Enable speedy access to modernised and integrated radiotherapy services	Improvement in access to radiotherapy service Increased access to new diagnostic and treatment	Cancer – referral to treatment Report on therapies provided and	1 year on from opening

	therapies not provided in current centre	patient volume	
Improve the experience of access and engagement to radiotherapy services for people from deprived areas.	More hard to reach patients using centre Uplift in patient satisfaction Reduction in DNA rates	Survey of staff and patients regarding how accessible they find the facility. Compare DNA rates with current rates	1 year on from opening
Improve the convenience of access to radiotherapy services that are patient centred, safe and clinically effective Access to services both diagnostic & treatment not previously available locally	High use of the new facility from the agreed catchment area. Ease of access to new facilities compared to the West of Scotland Beatson Cancer Centre.	Stakeholder survey to ensure awareness of new facility. Monitor uptake from the agreed catchment area for the new facility. Patient survey of effectiveness of and access to the new facility.	One year from opening
Improve and maintain retention and recruitment of staff for the host site.	Uplift in satisfaction Decrease in absence rates Decrease in staff turnover	Staff satisfaction survey at end of year 1. Monitor absence records and contrast to previous. Monitor staff turnover rates	One year from opening
Deliver a more energy efficient building within the host sites estate, reducing CO2 emissions and contributing to a reduction in whole life costs through achievement of BREEAM healthcare rating of excellent	Contribute to NHS Scotland's shared target for reduced carbon emissions	Reduced emissions and lower running costs	From opening
Achieve a high design quality in accordance with the Board's Design	Provide a clinical environment that is safe and minimises any HAI	Use of quality design and materials	From opening

Action Plan and guidance available from A+DS.	risks Building makes a positive contribution to health	HAI cleaning audits	
Creation of an environment people want to come to, work in and feel safe in.	Building provides a welcoming environment for patients , with security as part of design	Building contributes to local regeneration strategy	
Making tangible the aspirations expressed by stakeholders in the Design Statement.	Building is flexible enough to be 'future proofed'	Building meets the standards to be agreed in the Design Statement	

6. Business Scope & Service Requirements

This development would provide a 4 bunker 2 LinAc radiotherapy facility, which will help to alleviate the pressing capacity constraints at the BWoSCC in the short term. In the medium to longer term based on current predictions a 3rd LinAc will be required to meet the demand expected to occur by 2017, therefore a 4 bunker facility is planned. Service provision will also include the ability to carry out treatment planning and CT Simulation, which will be an integral feature of this new service. In addition to the current requirements for this development, consideration has also been given to additional potential further increases in demand. One crucial criterion, which is essential to support the hosting of this proposed facility, is the ability to future proof against any further increase in demand by having the availability of surrounding land, which would enable the expansion of the facility if required.

7. Risks, Constraints & Dependencies

7.1 Main Risks

The main project risks and mitigation factors are identified at a high level at the IA stage. As the project develops through the OBC (OBC) and Full Business Case (FBC) stages a more detailed and quantified risk register will be prepared.

Table 2: Risks

Risk Categories	Description	Mitigation
Business Risks	Financial	Robust business case & procurement process
	Political	Encompass current legislation and adherence to strategies and key programmes Early engagement with Scottish Government and West of Scotland Health Board colleagues
	Environmental	Early sustainability briefing
	Strategic	Adherence to National Policies and guidelines

	Quality	Detailed briefing & monitoring Ensuring alignment with the three pillars of the Quality Strategy i.e. the safe provision of service, that care is patient centred and clinically effective.
	Procurement method	Robust review and consideration of all appropriate and available procurement routes.
	Funding	Robust business case and close dialogue with SGHD and West of Scotland Boards
	Organisational	Effective communication and co-ordination of progress and emerging issues via Health Board representatives on Regional Planning Group, staff and patient representatives.
Service Risks	Workforce	Staff engaged as stakeholders
	Technical	Employ strict change control management processes
	Cost	Employ strict change control management processes
	Programming	Plan & monitor with reference to an early warning strategy and develop a commissioning programme.
	Operational support	Manage staff and service user input effectively
	Quality	Detailed briefing & monitoring of design together with the use of the Achieving Excellence Design Evaluation Toolkit (AEDET) evaluation tool. Achieving the Quality Strategy ambitions.

7.2 Constraints

A number of criteria/adjacencies were identified as being essential to supporting the adoption of good practice and need to be met to be able to support the hosting of a satellite radiotherapy facility, which are detailed in the central belt scoping report. These identified constraints such as the availability of land

and ease of access for patients of the service, will influence the decision making process of the preferred site to host the facility.

7.3 Dependencies

This IA solely relates to the development of a satellite radiotherapy facility in the West of Scotland. Possible hosts and available sites have been identified for this facility and are listed under section 8.4 and no further development is required of other areas to support this proposed development. A number of criteria/adjacencies were identified as being optimal to supporting good practice including 24 hour A&E access, Chemotherapy services and ITU, however the key back up required is acute care for a cancer patient rather than a specialist oncology department This is described in detail under the criteria section of the IA.

8 Exploring the Preferred Way Forward

8.1 Main Business Options

A number of different options have been considered nationally and regionally to help resolve the recognised constraints on radiotherapy provision across Scotland. The Central Scotland Satellite Radiotherapy Scoping work details the attempts to find a solution, which would support acknowledged constraints on service provision within the West of Scotland and those anticipated within the East of Scotland. The following details the long list of initial options, many of which were considered as part of the central Scotland scoping work. Following on from the scoping work additional options, which had the potential to meet the needs of a West of Scotland population, were also considered.

Long List of Options

- Maintain Status Quo
- Extend BWoSCC
- Extend Edinburgh Cancer Centre
- Build Satellite Radiotherapy facility in Forth Valley Royal Hospital
- Build Satellite Radiotherapy facility in Hairmyres Hospital
- Build Satellite Radiotherapy facility in Monklands District General Hospital
- Build Satellite Radiotherapy facility in St Johns Hospital
- Build Satellite Radiotherapy facility in Wishaw General Hospital
- Build Satellite Radiotherapy facility in Crosshouse Hospital

Maintaining the Status Quo is not an option as the BWoSCC is currently operating at full capacity. Extension to the current regional cancer centres was considered but quickly assessed as being not viable due to a lack of available space. Secondly, the centre is already significantly bigger than other major centres and to increase further would potentially increase the risks to the safety and quality of service provision. The central belt work clearly demonstrated that a central location does not provide sufficient relief to the main cancer centres and separate solutions are required to resolve each regions current and future capacity difficulties. The Edinburgh Cancer Centre is landlocked and does not have the available footprint to enable it to increase its capacity. Secondly increasing the available capacity at the Edinburgh Cancer Centre if possible would not provide the required relief to the existing capacity constraints present at the BWoSCC. St Johns Hospital would not provide the required relief to the existing capacity constraints at the BWoSCC. It was established that within a 30 minute travelling time only 0.2 LinAc demand would be removed from the BWoSCC, which is insufficient to meet the pressing needs of the centre.

NHS Ayrshire & Arran, NHS Forth Valley and NHS Lanarkshire were invited to submit notes of interest in hosting a proposed West of Scotland satellite radiotherapy facility and all have indicated an interest.

In preparing the IA all appropriate funding and procurement options were considered including NPD. However, based on the indicative costs identified, it was noted that after stripping out the large equipment element, the remaining construction costs were circa £16m. As detailed in SCIM, the de minimus level for considering whether projects are suitable for NPD is £20m. Consequently the guidance contained within SCIM has been followed i.e. the default procurement route for any acute construction projects not suitable for NPD is Frameworks Scotland.

Given the Regional nature of the project it was felt that national, as opposed to local, capital would be the most appropriate funding vehicle to be explored if approval is received to develop the IA to OBC stage.

8.2 Criteria

A number of criteria/adjacencies were identified as being optimal to support a satellite radiotherapy facility. These were identified in the central belt scoping report in Annex A and included the following;

- Clinical Benefit**
 - The site has access to 24 hour A&E access.
 - Chemotherapy services are provided at the site or have the scope to be provided.
 - The site has access to digital x-ray and CT scanning.
 - The site has an ITU.

- Patient Access**
 - Would additional parking facilities be required to support access to the proposed facility.
 - Comprehensive public transport access was required to the proposed facility.

- Strategic Fit**
 - Does the site have the available footprint to host a 3 LinAc/4Bunker (approx? 2000m²) facility and have the scope for potential future expansion.
 - Has there been any difficulty previously attracting clinical staff to work at this Site?

8.3 Critical Success Factors

The following Critical Success Factors (CSFs) have been identified as the attributes essential to the successful delivery of the project. The CSFs are used in conjunction with the investment objectives to evaluate the long list of possible options.

Table 2: Critical Success Factors

Key CSFs	Broad Description
Strategic fit & business needs	How well the option meets the agreed investment objectives business needs and service requirements.
Potential Value for Money	How well the option meets current and future capacity needs.

Potential achievability	How well the option is likely to be delivered within the agreed timescales.
Supply-side capacity and capability	How well the option optimises the potential return on expenditure, business outcomes and benefits.
Potential affordability	Can the organisations fund the required level of revenue and capital expenditure?

8.4 Short List of Options

Following a review of the criteria and analysis of suitable sites locally to potentially host a satellite radiotherapy facility Lanarkshire Health Board have put forward Monklands District General Hospital as the sole possible site to host this proposed facility within their health board. It was concluded that both Hairmyres Hospital and Wishaw General Hospital did not have a sufficiently large physical footprint to host the facility. Moreover Wishaw General was geographically not in the ideal position to host a West of Scotland facility and serve the catchment population. NHS Forth Valley has identified 4 potential sites at Forth Valley Royal Hospital. Similarly to Hairmyres Hospital and Wishaw General Hospital, Ayrshire & Arran Health Board does not have available the required footprint to host a facility at Crosshouse Hospital and although other sites in NHS Ayrshire & Arran do have the available footprint to accommodate a facility of the proposed size, travel time to the site and the access to clinical adjacencies, which were seen as an optimal requirement to support radiotherapy service provision were not available and which were not possible to overcome.

The option appraisal process was undertaken in conjunction with representatives from various NHS Boards across Scotland and is described in detail within Appendix 1 of the IA. This was undertaken on 7th February 2012 and involved the identification of key criteria, and the subsequent scoring of these, across potential locations which had been previously identified through detailed analysis of a number of factors. These include clinical considerations, projected activity, capacity, and associated travel times. Whilst it is recognised the option appraisal may not have followed the Options Shortlist Framework detailed within SCIM, it is considered that the process undertaken was sufficiently robust to identify the appropriate shortlisted options.

Hairmyres and Wishaw General hospitals “options” were not formally appraised as it became clear early on that the designated space requirement could not be achieved at those sites. The backlog maintenance issues at Monklands Hospital do not come into consideration as the option being considered is a new-build on a brown-field location and not part of the existing hospital buildings. Central to the review of its cancer strategy NHS Lanarkshire identified Monklands Hospital as central to its cancer service provision, which includes the potential provision of radiotherapy on site. The strategic planning assumptions for Monklands include the long-term provision of acute clinical services (February 2008). Monklands is also the designated cancer centre for Lanarkshire as agreed by the Cabinet Secretary for Health and Wellbeing (27th February 2008).

The following options are therefore to be considered for establishing the additional required radiotherapy capacity to assist with managing the West of Scotland demand;

- **Maintain Status Quo**
- **NHS Forth Valley - Forth Valley Royal Hospital x 4 sites**
- **NHS Lanarkshire - Monklands District General Hospital x 1 site**

8.5 Outline Commercial Case

The purpose of setting out the commercial case is to consider the implications of potential procurement options. Detailed consideration of all appropriate procurement routes will take place during the production of the OBC as part of a full value for money and affordability assessment.

8.6. Financial Case

The purpose of this section is to set out the indicative financial implications of the shortlisted options. Detailed analysis of the financial case will take place at OBC stage.

- **Capital & Revenue Constraints**

Funding for fees to allow completion of option appraisal work to OBC stage will be provided by the West of Scotland Health Boards and will be accessed as required via the Directors of Finance.

- **Indicative Capital Costs**

The table below presents the indicative capital costs for the two shortlisted sites.

Table 3: Capital Costs

	Option1 NHS Forth Valley (4 potential sites)	Option2 NHS Lanarkshire- Monklands District General Hospital site
	Cost Range £m	Cost Range £m
Land	0	0
Construction including 4 bunkers	£16.1m to £17.3m	£16.1m to £17.3m
Equipment including 2 linear accelerators	£7.2m	£7.2m
Total Capital Cost Range	£23.3m to £24.5m	£23.3m to £24.5m

The indicative capital costs for the WoS Radiotherapy Satellite facility range from £23.3m to £24.5m. These indicative costs have been prepared by applying an estimated construction cost per square metre to the estimated gross area of the facility. Allowances for professional and technical fees have been calculated as a percentage of the forecast construction costs and all figures include irrecoverable VAT. Given the early stage of the project's development an estimated risk provision has also been incorporated within the figures. In respect of the maximum cost range, this has been calculated as a percentage of the full potential costs of the facility. In the case of the minimum cost range, this has been applied only to the construction elements of the scheme. More detailed costs are available in Appendix 1.

No allowance has been made for any site specific issues or solution-specific connections to existing buildings; however, these issues will be addressed at OBC stage.

Optimism Bias will be developed further during the OBC process in accordance with HM Treasury Green Book Supplementary Guidance – Optimism Bias.

A delay in the construction will lead to overall project slippage that impacts on the benefits to be accrued from the provision of much needed additional linear accelerator capacity in Scotland. Equity of, and timely access to radiotherapy, combined with the ability to provide modern radiotherapy planning techniques that are clinically cost effective, delivered in a safe and efficient service, ensures that the Scottish Government's strategic objectives are supported in the delivery of cancer care (*'Wealthier & Fairer', 'Healthier', 'Safer and Stronger', 'Patient centred' & 'Effective'*).

Additional capacity to support patient access is being sustained in the West of Scotland by operating ageing linear accelerators in longer working days. The long term sustainability of this approach cannot be guaranteed as the risk of equipment failure is significantly increased, as major components fail and need replaced. Several of these accelerators will be beyond their recommended operational lifespan by 2014/15, and hence the continuity of this extended hours service is at significant risk, the longer this model is delivered.

- **Revenue & Lifecycle Costs**
Indicative Revenue Costs

Capital Charges

Capital charges have been calculated on the above indicative capital costs assuming a 40 year life for the construction costs and 10 year life for equipment. The estimated capital charges range from £1,120k to £1,149k per annum.

Staff & Running costs

High level revenue costs have been produced for staffing, estate and consumables and have been estimated at a range of between £2.3m and £2.4m. This is based on the assumption that all staff costs for the 2 LinAcs are new and in addition to the existing radiotherapy staffing. This assumption will be further evaluated along with opportunities for redesign in detail at OBC stage.

In total the estimated recurring revenue costs associated with the short listed options range between £3.4m and £3.6m. All Boards have confirmed their commitment to the additional revenue costs and a statement to this effect will be formally incorporated into the OBC.

In terms of staffing, the staffing cost has been estimated at £2.3-£2.4 million and is based on additional staffing costs but the expectation is that opportunities will be taken to achieve efficiencies and redesign services as we move to the satellite provision. A patient pathways group is currently considering the service model and working through the detail of which staff may rotate etc. There will be an opportunity to maximise the use of integrated radiotherapy information and planning systems between the main site and the satellite to optimise pathway processes and make the most effective use of staff resources eg. paperless systems, potential for remote planning and electronic approval etc.

Recommendations on productivity for radiotherapy services, including the National Advisory Group in England, indicate that a benchmark of 87-90% should be applied so services are capable of delivering 13% more activity than is actually required. This makes a 10% allowance for variations in demand, and ensures patient access can be secured to ensure national standards for waiting times are met. This would be consistent with the general approach taken on bed occupancy in the NHS ie. that bed occupancy needs to run below 100% (for example 85-90%) if the acute medical needs of the population are to be dealt with in a timely way. A further allowance of around 3% is recommended to support the implementation of new radiotherapy

techniques and to allow time for staff to be trained in their safe delivery, a requirement under medical exposure legislation (IRMER).

This will inform the more detailed costing provided at OBC stage. A change programme is under consideration and will be available for the OBC. The existing team at the Beatson team have previously effectively operated a satellite service within Glasgow and this experience will be used to inform the detailed change programme which is currently being prepared.

- **Overall Affordability**

A full affordability analysis will be undertaken at OBC stage to confirm whether the capital and revenue costs associated with the new facility are affordable within the available funding levels. The anticipated demand projections have been signed off and agreed by Boards and Scottish Government colleagues through the Pathways and Processes Group. The recent population projections are likely to increase these assumptions so it seems clear that the demand will materialise and will need to be met. West of Scotland Boards have agreed in principle to fund the revenue consequences.

8.7 Management Case

The project, should it proceed, will be managed by a Project Board chaired by the West of Scotland Director of Regional Planning. The West of Scotland Regional Planning Group and the Regional Cancer Advisory Group Director will act as Project Sponsors.

The Project Board will comprise representatives from NHS Ayrshire & Arran, NHS Forth Valley, NHS Greater Glasgow & Clyde, NHS Lanarkshire, Regional Planning, Staff Representatives and Patient and Staff side representatives. The Project Board will be expected to represent the wider ownership interests of the project and maintain co-ordination of the development proposal. The Project Board will report to the West of Scotland Regional Planning Group and Regional Cancer Advisory Group.

A Project Core Working Group will be put in place to manage the day to day detailed information required to deliver the project. The project will also be supported by a series of sub groups / task teams as required and identified in the *Guide to Frameworks Scotland published by Health Facilities Scotland*. These task teams will include Design User Group; Commercial; IM&T; Equipment; Commissioning and Public Involvement.

The Board anticipate that the Initial Agreement will be considered by the Capital Investment Group on 27th November 2012. Should approval be granted to move to OBC, then the indicative project timetable is as follows:

Table 4: Project Timetable

Satellite Radiotherapy Project Board Approval of IA	October 2012
CIG Approval of IA	November 2012
Satellite Radiotherapy Project Board Approval of OBC	May 2013
CIG Approval of OBC	May 2013
Project Board & Host Board Approval of FBC	January 2014
CIG Approval of FBC	February 2014

Construction Start	February 2014
Construction Completion	July 2015
Commence Clinical Service	Latter half of 2015
Post Occupation Review	Early 2016
Post Project Evaluation	+12 months from occupation

The completion date of July 2015, which is earlier than the proposed date within the central Scotland scoping report, reflects the clinical urgency to progress with the establishment of the new facility as quickly as possible within the West of Scotland to help maintain optimal radiotherapy service provision for the West of Scotland population.

9 Conclusions & Recommendations

The paper offers a summary and rationale for the proposed new build West of Scotland Satellite Radiotherapy Facility through the procurement process. It is requested that the Capital Investment Group consider this Initial Agreement and that approval be granted to move to the development of an OBC.

Appendix 1

**WoS RADIOTHERAPY SATELLITE PROJECT
FINANCIAL MODEL**

APPENDIX 1 CAPITAL COST ANALYSIS

		m2 or no.	£/m2 ex VAT	Total Incl VAT	Total Incl VAT
CAPITAL COSTS				Maximum	Minimum
Accommodation - 4 bunkers	(from NHS Lanarkshire Option Appraisal)	1833			
Service / Utility Space	(not included above)	500			
Wall allowances	(10% not included above)	233			
		2566.3	£4,000	£12,318,240	£12,318,240
Total Works Cost				£12,318,240	£12,318,240
Non-Works Costs - Land	Land			£0	£0
Non-Works Costs - Other	Professional Fees	13.5%		£1,662,962	£1,662,962
	Statutory Fees			£72,000	£72,000
	Utilities Allowance			£180,000	£180,000
	Project Management & Set-up	5.0%		£615,912	£615,912
TOTAL BUILD COST				£14,849,114	£14,849,114
Equipment	Linear Accelerators	2	£1,700,000	£4,080,000	£4,080,000
	IT Infrastructure Allowance			£600,000	£600,000
	Treatment Planning Hardware/R&V System			£900,000	£900,000
	CT Simulator			£600,000	£600,000
	Radiotherapy Support Equipment			£420,000	£420,000
	Network Allowance			£180,000	£180,000
	General Equipment Allowance			£360,000	£360,000
TOTAL EQUIPMENT COST				£7,140,000	£7,140,000
Optimism Bias / Contingency / Risk				£2,498,911	£1,281,824
Total				£24,488,026	£23,270,938
Excludes					
	Site-specific conditions				
	Solution-specific Connections to existing buildings				

ANNEX A

Radiotherapy Satellite Scoping Report

Purpose of the report

The purpose of this report is to provide a high level assessment of the potential options for a satellite radiotherapy facility within the central belt of Scotland. The report will inform the development of a business case for any satellite development. The scoping project did not consider the management options or detailed costs for the facility, nor did it consider the detail of chemotherapy delivery. The project was jointly sponsored by West of Scotland Cancer Network (WOSCAN) and South East Scotland Cancer Network (SCAN.) Members of the Steering Group are drawn from the Regional Cancer Advisory Groups (RCAG) and are shown at Appendix 1.

The need for additional radiotherapy capacity

Previous work completed by the National Pathways and Processes Group (Jan-July 2010) and drawing on earlier work completed by Featherstone and Erridge recommended an additional three Linear Accelerators (LinAc(s)) would be required in Scotland to meet a predicted demand on radiotherapy services of 250,000 fractions by 2016. This work explored the current use of the existing 25 LinAcs. The group concluded that if existing machines were operational for 9 hours per day (with an average throughput of 5 fractions per hour) then the lower end of the predicted rise in demand may be met. However, even with an increase to a 10 hour working day it would not be possible to meet the upper end of the predicted demand for radiotherapy with the existing stock of LinAcs. In addition, this work explored maximising the productivity of LinAcs across all centres in Scotland. However, due to population and geographical constraints absolute equalisation of LinAcs in each centre was not possible. The majority of cancer patients requiring radiotherapy live in the central belt of Scotland and Government policy is to provide treatment as locally as possible.

Based on the principal that each LinAc was utilised on 259 working days per year and had an utilisation rate of 90%, the need for additional LinAcs was calculated. This work concluded that based on an average 9 hour working day, with a throughput of 5 fractions per hour, 28 LinAcs would easily meet the lower end of the predicted rise in demand. Increasing these 28 machines to a 10 hour working day would almost meet the upper end of the expected rise in demand. Therefore, an additional 3 LinAcs (taking stock from 25-28) was recommended.

Timescale for the proposed development

The full business case for this development will need to be complete by early 2012/13 with a view to capital allocation in 2015/16. The anticipated timescale for the facility opening to patients is 2017.

Current and Projected Demand across SCAN and WOSCAN

The current and projected demand for radiotherapy services in SCAN and WOSCAN showed that the current cancer incidence is at 107,980 rising in 5 years to 116,882 and in 10 years to around 126,312. While there is a potential change projected in breast radiotherapy treatment which should serve to reduce fractionation rates for all other cancers the radiotherapy demand will remain or even potentially rise.

Assessment of Current and Projected Demand for a Central Belt Satellite Centre

The Steering Group considered the clinical casemix to be treated within a satellite radiotherapy facility and identified the following cancer sites to include within the scoping exercise:-

- breast
- lung
- prostate
- rectal

These cancer sites were chosen in order to maximise the impact on radiotherapy services whilst keeping the need for pathway redesign to a minimum. In total, these cancer sites account for 45% of all cancer incidence and take up approximately 60% of all radiotherapy activity. The group agreed a series of capacity and utilisation assumptions for radiotherapy treatment provision. These are shown at Appendix 2 and are in line with the assumptions used to inform the national pathways work cited above. The group estimated that the potential capacity of a 3 Lin Acc satellite facility is in the range of 25,819 fractionations, a utilisation rate of 85% based on 4.5 fractionations per hour.

Having identified the available capacity, the group then modelled the anticipated activity based on the agreed casemix. Using projected cancer incidence data and patient flows mapping techniques, the group was able to assess how many patients could be treated within a 30 minute travel time radius of the potential locations. Other travel time boundaries considered were 20, 40, 60 and 90 minutes however it was demonstrated that a 30 minute boundary provided the better fit from a capacity planning perspective. The impact of a 40 minute travel time on Forth Valley Royal was modelled and did generate more activity but raised issues of acceptability as much of this patient flow was from north and west Glasgow from patients who were living close to the existing cancer centre at the Beatson. It is not clear whether patients outwith the Forth Valley health board region would be appropriate to transfer from the existing centres at the Beatson and Edinburgh Cancer Centre to a new site at Forth Valley. The patient representative on our Steering group considered that asking patients who are already living next to an existing cancer centre to travel for more than 30 minutes to a different centre would be difficult. The 30 minute modelling showed Monklands was able to deliver radiotherapy to the largest number of patents of patients travelling within 30 minutes followed by Forth Valley Royal and then St Johns.

The group then went on to model the impact on the existing cancer centres of this additional satellite facility capacity when it opens in 2017. From a 30 minute travel time catchment Forth Valley Royal Hospital was able to provide 1.18 Lin Acs worth of activity that would otherwise have gone to the Beatson plus an additional 0.38 Lin Acs worth of activity from Edinburgh. The same figures for Monklands were 2.4 and 0.1 respectively and for St Johns 0.2 and 1.0. Therefore there would not appear to be any immediate benefit for the East of Scotland in a central belt solution based on activity expected in 2017. This information was used to inform the option appraisal and is attached in a series of charts at Appendix 3.

The group also reviewed projected population data profiled over future 5 and 10 year periods collated from General Registry Office (GRO) data and noted that all three regions are expected to see an increase in their populations with South East and Tayside (SEAT) and the Lothian area seeing the largest increase. For the West of Scotland (WoS) the populations of both Forth Valley and Lanarkshire are projected to increase against a slight decrease in the Glasgow population over the same period. A projected population increase in the Lothian area was also reflected in other central belt areas such as Forth Valley and Lanarkshire (although not to quite the same extent). Conversely, the population in Glasgow was projected to decrease over the same period. Work was also undertaken to model the capacity requirements in the next 5-10 years when potential population changes are taken into consideration and the relevant cancer incidence increases for the appropriate cancer networks are applied. As with all projected data there are limitations to the data and at this point in time it was not possible to include any potential increase in populations of the datazones, however the cancer projections used, collated from Information Services Division (ISD) projections took account of anticipated changes in the health board populations. This modelling showed that the population

changes are expected to have little implications for the capacity requirements for the locations considered in this work. This work is attached in a series of charts at Appendix 4.

Appendix 5 details the projected 30 & 40 minute car travel boundaries when travelling to or from Forth Valley Royal Hospital, Monklands District General Hospital and St. John's Hospital.

Identification of Potential Locations

While a total of 3 locations are referred to in the modelling above there was an original long list of 5 potential locations. The Steering Group identified the NHS Boards with DGH facilities which could possibly serve as potential locations and following discussion with the relevant Boards, five locations were agreed for initial consideration:-

- St John's Hospital
- Forth Valley Royal Hospital
- Wishaw Hospital
- Hairmyres Hospital
- Monklands Hospital

Prior to the option appraisal, NHS Lanarkshire removed Hairmyres and Wishaw from the list for consideration due to site space constraints.

Health Board representatives were asked to complete an agreed template in advance of the option appraisal meeting in order to provide the Steering Group with detailed information about each of the proposed locations. The template asked for details around a series of questions to provide information to inform the decision making around the three criteria of clinical benefit, access, and strategic fit. The completed templates for the three locations are attached at Appendix 6.

Inclusion of Treatment Planning within the Satellite Facility

The Steering Group made an early decision to include treatment planning within the footprint for any satellite facility. The group considered that in the light of advances in treatment planning techniques, the additional space requirements for Physics staff and also Oncologists, Oncology Nurses and Therapy Radiographers were an essential part of safe service delivery. The additional space requirements are relatively minimal and the safety gains are potentially significant.

The Royal College of Radiologists (2004)ⁱ, state that technical standards must be high in the provision of any devolved radiotherapy service and provision should be made for advanced planning techniques including intensity modulated radiotherapy (IMRT). Within the next two years, it is estimated that a larger proportion of radical patients will receive IMRT and by the opening of the new facility, this will be the accepted standard of radiotherapy for many tumour groups.

Various models have been applied in the provision of Physics treatment planning facilities within satellite centres. In Canada and Australia, the approach has been to make provision for Physics staff at the devolved facility. The benefits to be gained from having appropriate physics staffing on-site, include the ability to react at short notice and provide specialist advice on individual patient's treatment plans. Adjustment to a plan is often required both after it is prepared and before treatment commences or following on-treatment imaging. The risk of any misinterpretation or information being overlooked is minimised when Physics treatment planning staff are available on-site where direct communication can take place or indeed, the patient and their plan setup is examined directly on the accelerator. This makes it essential to have radiotherapy planning on the delivery site.

Computed Tomography (CT)

A CT Simulator will be required to support the additional treatment capacity to be delivered in any agreed satellite facility and access to back up at a main centre. In the West of Scotland treatment centre at the Beatson, there are currently 3 CTs and one conventional Simulator for the 11 accelerators, while the Edinburgh centre has 2 CTs for their 6 accelerators. The average CT Simulator scans 200 patient sessions per month. Assuming a patient workload of 1,750, the satellite facility would require around 2,000 scans per year equating to an utilisation of around 80% for one CT.

Physical Constraints

Wherever treatment planning is undertaken, sufficient office and workstation space will be required to accommodate the additional staff involved in the treatment planning of those patients to be treated at the satellite facility. This would include Physics staff in treatment planning itself but would also include the Oncologists and Therapy Radiographers along with all the necessary facilities for clinical assessment and treatment.

Option Appraisal

The Steering Group used an option appraisal process to structure their decision making around the ranking of the 3 locations under consideration. Option appraisal is a technique for reviewing options and analysing their relative costs and benefits. In essence performing an option appraisal involves identifying relevant options and scoring them according to some pre-defined criteria, where the criteria have been weighted to reflect their relative importance. In this case the three criteria against which each of the 3 locations was judged are shown below:

Criteria	Definition	Core Elements
Clinical Benefit	Having access to the full range of acute services required to support patients attending a satellite radiotherapy facility.	<ul style="list-style-type: none">• Access to radiology services including digital x-ray and CT scanning.• Access also to Chemotherapy, ITU and A&E if required
Patient Access	The number of patients from the target radiotherapy treatment populations who benefit in terms of being closer to the new location than to existing treatment sites.	<ul style="list-style-type: none">• The number of patients able to be treated within a 30 min travel timeframe radius.• Improvement in access to RT for the specified incident population.• Availability of car parking facilities.• Alternative public transport availability including bus and rail.
Strategic Fit	The extent to which the location improves current and future capacity to deliver radiotherapy across the central belt of Scotland and relieves capacity pressures on existing centres in the medium term i.e. 5 -10 years.	<ul style="list-style-type: none">• The additional number of fractionations able to be delivered across the central belt of Scotland.• The ability to expand from a 3 LinAc facility to a 4 LinAc facility.

		<ul style="list-style-type: none"> • The impact on service provision of the current cancer centres. • Wider associated benefits including equality of access, local hospital development and clinical expertise, educational and teaching developments.
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The Steering Group followed a 2 stage option appraisal process. At stage one the group discussed, assessed and weighted the individual criteria informed by the agreed supporting information. The group agreed an allocation of 100 points across the 3 criteria. Unusually, on the day the group could not differentiate between the importance of all the criteria and therefore all present agreed that each of the criteria was of equal importance, which meant in effect there was no difference between the criteria. Therefore the results of scoring alone determined the rankings. The Steering group considered that although equal in importance all three criteria needed to be prerequisites for any development and that each location would be expected to fulfil these core criteria.

At stage 2, each individual group member allocated 10 points for each criteria across the potential locations. For those members not attending the meeting ranking was completed after the meeting and submitted electronically- a full set of papers and also minutes of the meeting were provided to these people to inform decision making.

The results of the scoring are shown below:

Rank	Location	Total Score	Clinical Benefit	Patient Access	Strategic Fit
1	Monklands DGH	338	114	116	108
2	Forth Valley RH	325	118	102	105
3	St. John's Hospital	214	89	67	58

Discussion and Next Steps

This scoping work has provided a high level assessment of the potential options for a satellite radiotherapy facility within the central belt of Scotland. What became clear is that the three different sites had very different implications for the two current centres. A ranked list of options has been produced to inform future decision making. The two cancer planning groups were asked to consider if a central belt satellite facility would provide a solution to the provision of additional radiotherapy capacity. While the Monklands location provides a potential location to create additional capacity for the west of Scotland, it is almost exclusively a solution for the west. Forth Valley provides some capacity to existing centres but not enough to provide a solution without unacceptable patient flows. St Johns is a better solution for the East but has very little benefit for the west where the capacity problem is greatest. Monklands would appear to be the best solution for the current workload, but it was not possible with the current data to be absolutely sure that this would still be the case in 10-15 years time. The concept of a central belt satellite facility is not supported by the work done to date on patient activity and flows.

In completing this work the Steering Group has very much welcomed the opportunity to work collaboratively but recognises that the work was completed in a relatively short timescale. Had more time been available the group would have sought to complete more detailed data analysis with input from ISD. Colleagues within NHS Lothian now plan to take forward further more detailed work in conjunction with ISD around the impact of forecast population and cancer incidence on demand capacity and response options. This work will be sponsored through Scottish Government and report into the new National Radiotherapy Programme Board. The opportunity should also be taken when completing further activity

analysis to consider potential capacity solutions within the East of Scotland maximising the use of resources within Tayside.

The group wishes to highlight the need to see this work as one step towards planning for the additional radiotherapy capacity which will be required in NHS Scotland. This work highlights the need to embark on the next stages of the planning process at an early stage and the additional work described above will be the first step on that journey. Given the projected growth in population and also in treatments needed, there was a desire to carry out more detailed activity planning and a view that future proofing is of the utmost importance. It is important then that this scoping report is seen as a position statement and will need to be refined and built on as our planning base improves

Notwithstanding the need to continue the overall planning piece, the capacity problems within the west are pressing. The West RCAG should now move to assess the options for a west satellite facility serving the west Boards populations. The full business case for this development will need to be completed by early 2012/13 with a view to capital allocation in 2015/16.

Appendix 1 Group Membership

Steering Group

South East Scotland Cancer Network (SCAN) members

Professor Alex McMahon, Acting Director, Strategic Planning, NHS Lothian (Co-Chair)

Professor David Cameron, Professor of Oncology University of Edinburgh & Director of Cancer Services, NHS Lothian

Dr Sara C Erridge, Consultant Clinical Oncologist & Honorary Senior Lecturer, Edinburgh Cancer Centre, University of Edinburgh.

Peter McLoughlin, Strategic Programme Manager, NHS Lothian

Elizabeth Preston, Associate Director of Operations, NHS Lothian

Ms Jacqui Simpson, Director of Regional Planning, South East & Tayside (SEAT)

Brian Montgomery Medical Director, NHS Fife

Ms Lesley Jean Rugg, Head of Therapeutic Radiography

West of Scotland Cancer Network (WoSCAN) members

Ms Heather Knox, Director of Regional Planning, West of Scotland (Chair)

David Dunlop, Clinical Director Specialist Oncology Services, Beatson WoS Cancer Centre (BWoSCC)

Gary Currie, Head of Radiotherapy Physics Dept of Clinical Physics & Bioengineering, (BWoSCC)

Gary Jenkins, General Manager Specialist Oncology Services (BWoSCC)

Dr Hilary Dobson, Regional Lead Cancer Clinician, West of Scotland Cancer Network (WOSCAN) Clinical Director, WoS Breast Screening Service

Evelyn Thomson, Regional Manager, Cancer, WoSCAN

Mr Gordon McLean, Regional Service Improvement Manager, West of Scotland

Mrs Janette Fraser, Senior Planning Manager, NHS Forth Valley

Rhona Robertson, General Manager Cancer Division & Monklands Site, NHS Lanarkshire

Patient Representative

Ms Ann Muir

Core Group:

Professor Alex McMahon, Acting Director, Strategic Planning, NHS Lothian

Heather Knox, Director of Regional Planning West of Scotland

Dr Sara C Erridge, Consultant Clinical Oncologist & Honorary Senior Lecturer, Edinburgh Cancer Centre, University of Edinburgh.

Peter McLoughlin, Strategic Programme Manager, NHS Lothian

Janette Fraser, Senior Planning Manager, NHS Forth Valley

Dr Donna McIntyre, Project Manager - Cancer Team, Quality and Efficiency Support Team, (QuEST), Scottish Government Health and Social Care Directorates

Gordon McLean, Service Improvement Manager, West of Scotland

David Dunlop, Clinical Director Specialist Oncology Services, Beatson WoS Cancer Centre (BWoSCC)

Dr David Dodds, Clinical Lead for Radiotherapy (BWoSCC).

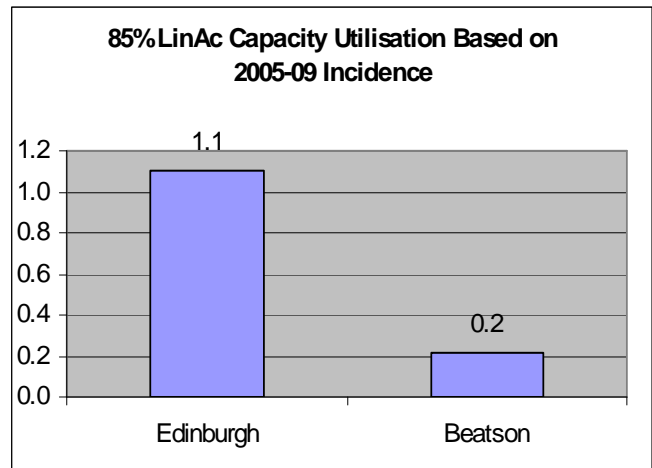
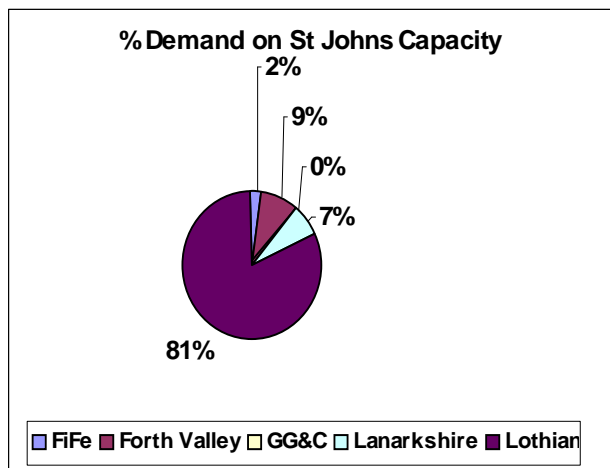
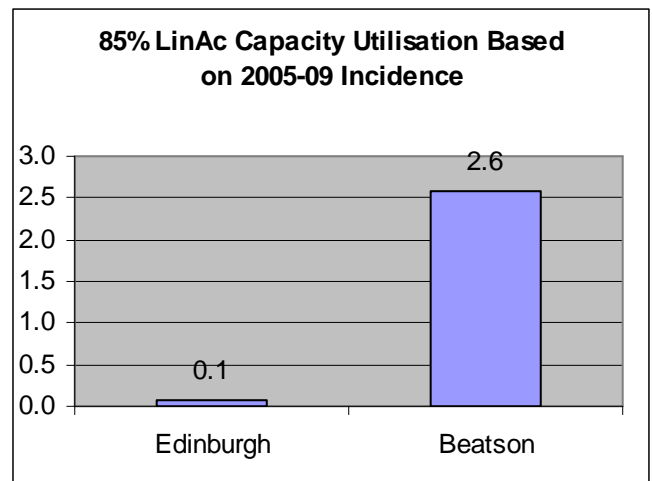
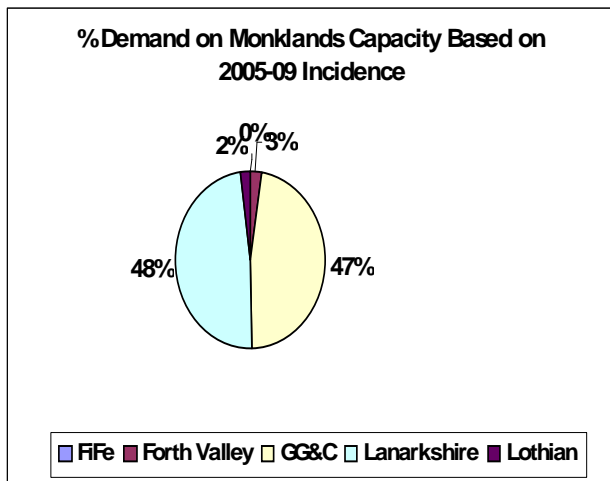
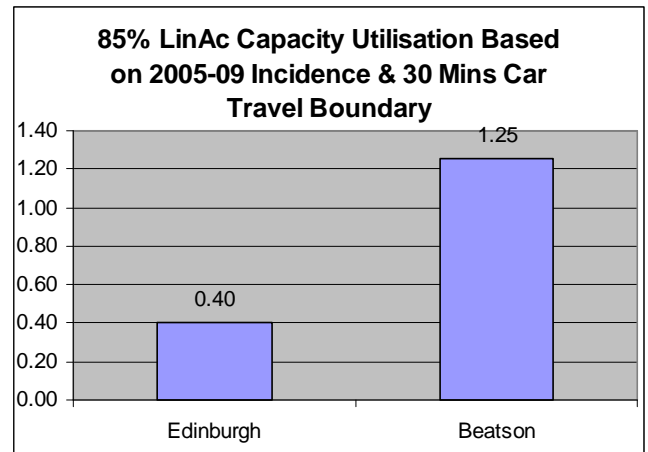
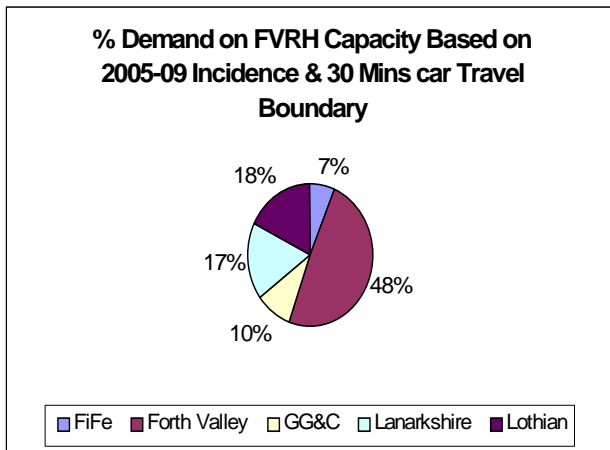
Gary Currie, Head of Radiotherapy Physics Dept of Clinical Physics & Bioengineering, (BWoSCC)

Appendix 2: Activity Assumptions

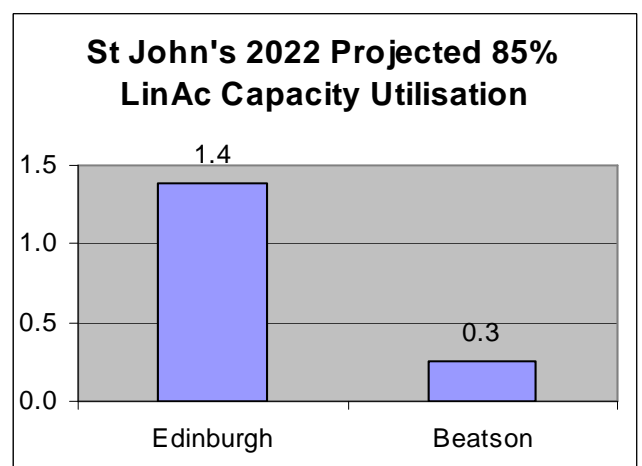
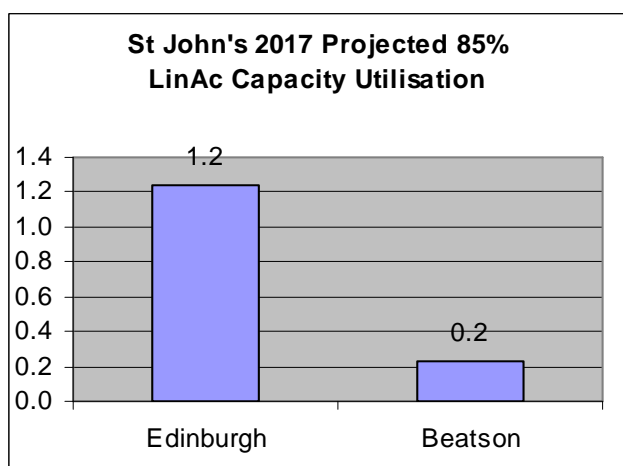
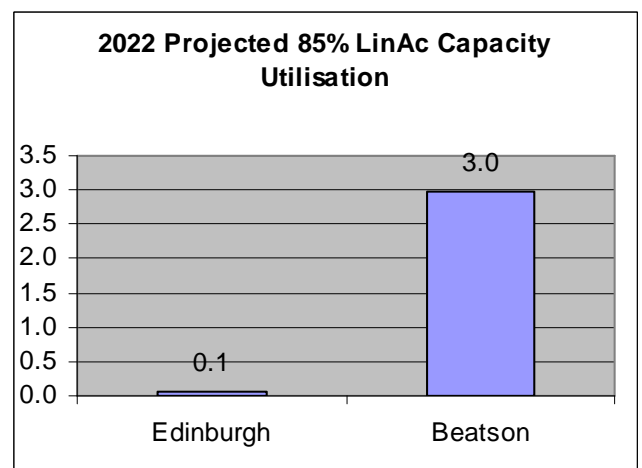
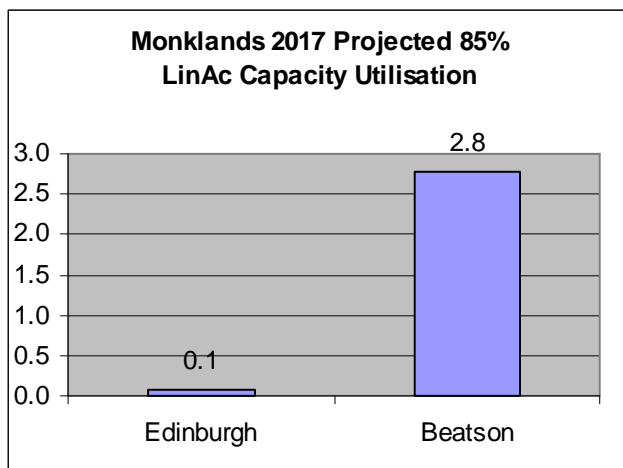
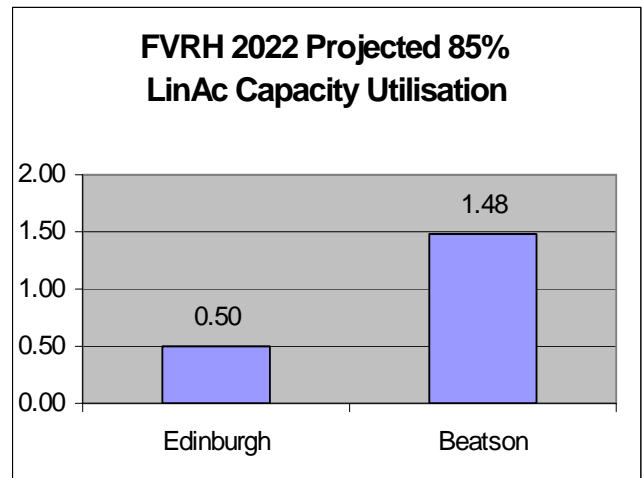
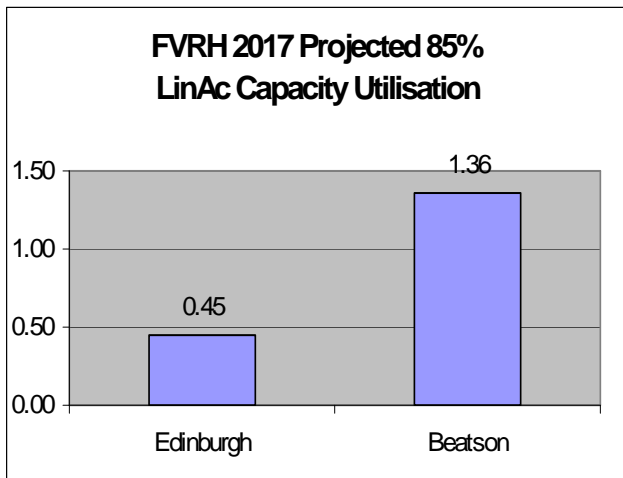
Central Belt of Scotland Satellite Radiotherapy Facility		
Agreed Demand & Capacity Assumptions to guide project		
Anticipated Capacity		
Variables	Number	Additional Information
Anticipated No. of Linear Accelerators (LinAcs)	3	Site needs to have flexibility to expand to a 4th LinAc if required
No. of fractions per hour	4.5	This is the average number of expected fractions per hour. Clinical complexity may lead to either a smaller or larger number of fractions per hour.
No. of operating hours per day	9	Opportunity for extended working will need to remain under review.
No. of operating days per week	5	
No. of operating weeks per year	50	Each machine will need to go through a total 10 day period of maintenance throughout the year, which is normally performed out of hours and in blocks of 2 days at a time.
Anticipated Total No. of Fractions Available Per year	30,375 #'s	10,125 #'s for one LinAc
Optimum Capacity Utilisation - 85%	25,819 #'s	8606 #'s for one LinAc
Anticipated Demand		
Demand is based on the identified tumour sites, which will be referred to the potential satellite facility locations. The anticipated incidence for each tumour site occurring within a 0-20 minute, 0-30 minute and 0-40 minute travel timeframe from each proposed site for the facility was modeled with consideration also given to the anticipated migrational flows and population changes for the health boards involved in this work. In addition, the projected radiotherapy rates and expected number of fractions required per tumour for both radical and palliative radiotherapy also informed the anticipated demand.		
Tumour Site	Radiotherapy Rates	Mean No. of Fractions
Breast	75%	17
Lung	46%	16
Genito-Urinary	51%	24
Rectal	58%	20

It should be noted that care has been required when considering the data used to inform this scoping work. The data used is high level and is based on the cancer incidence within a recognised datazone, which will vary in size geographically and population. More in depth and low level analysis will be required if and when it is agreed to proceed to full business case planning.

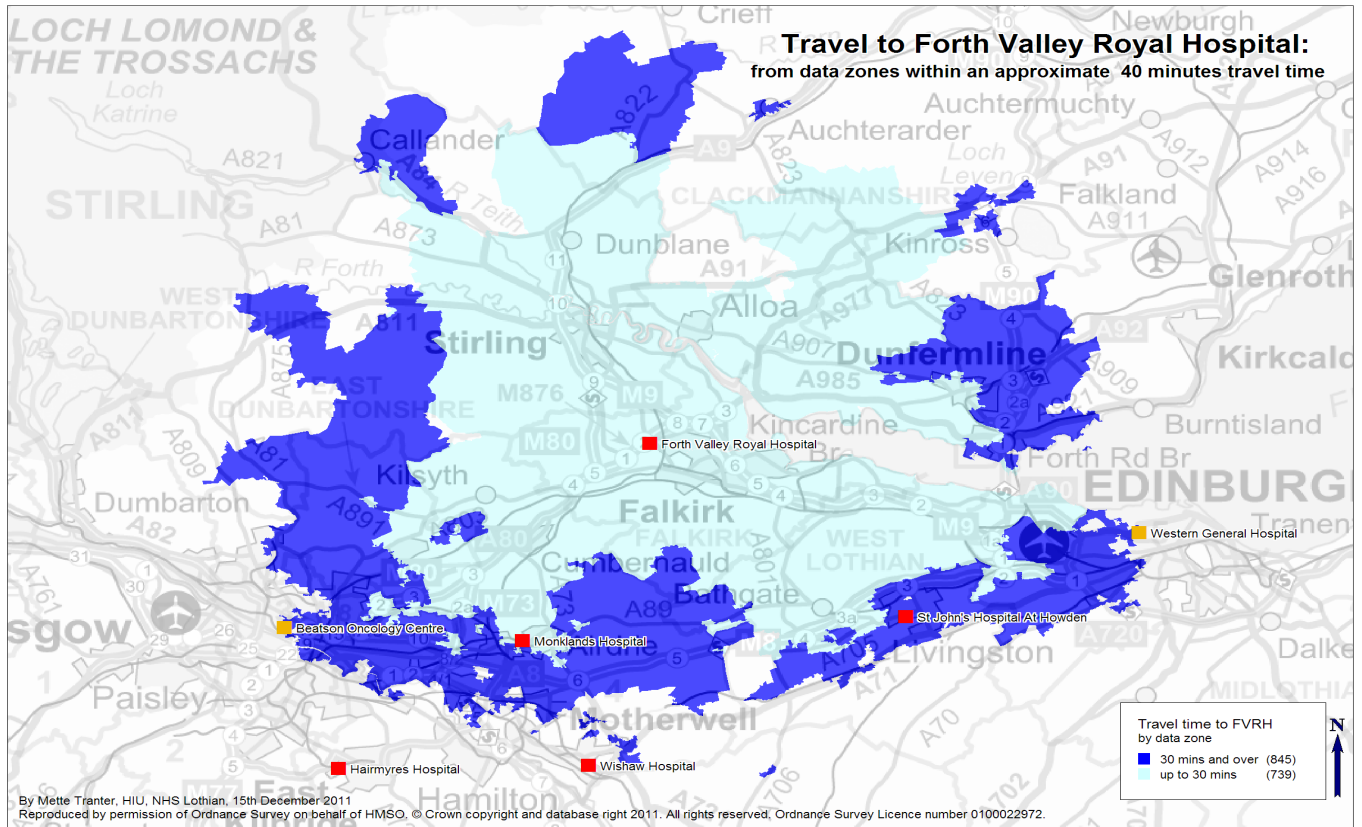
Appendix 3 - Current Demand and Capacity Utilisation Projections

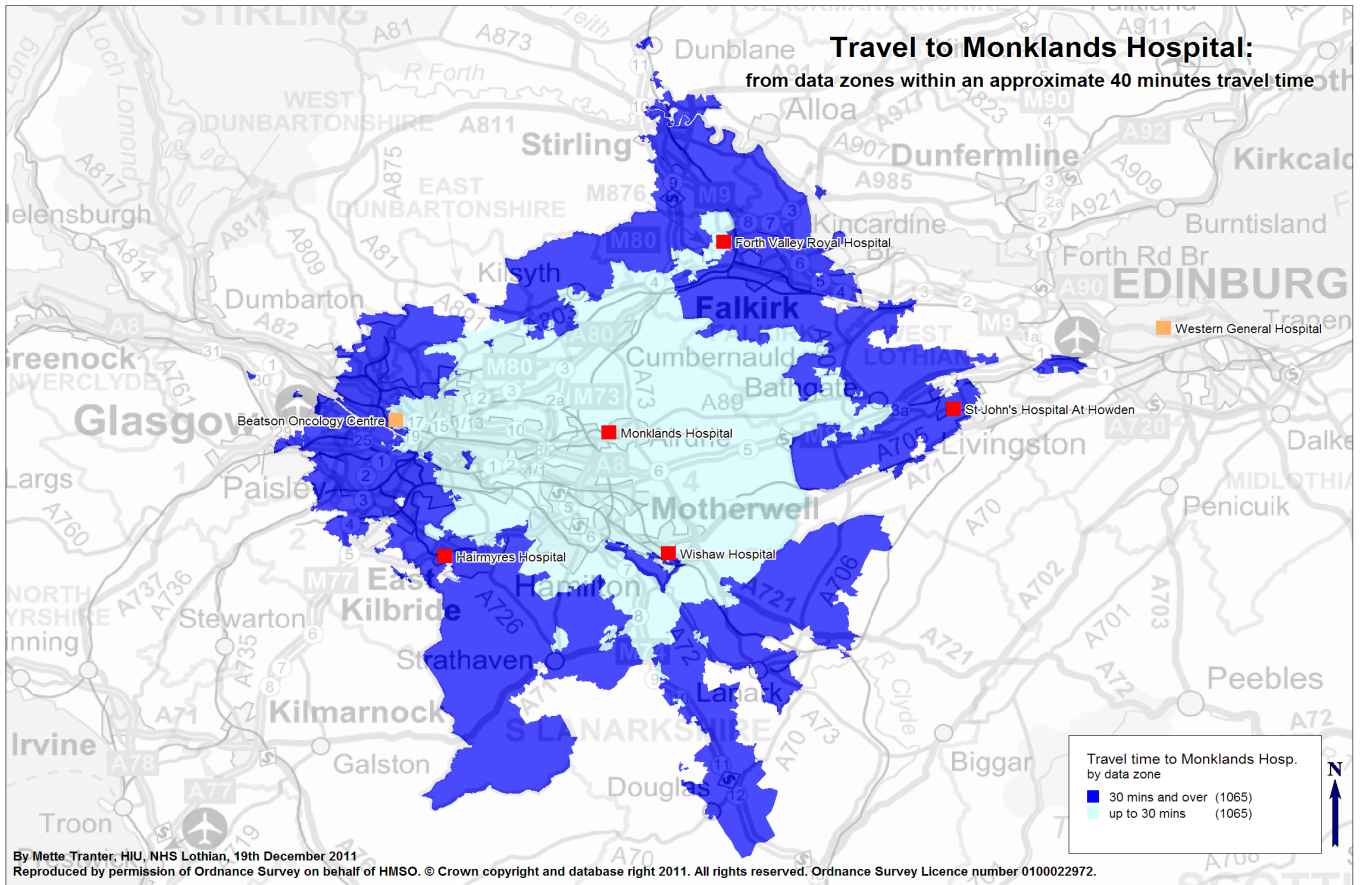


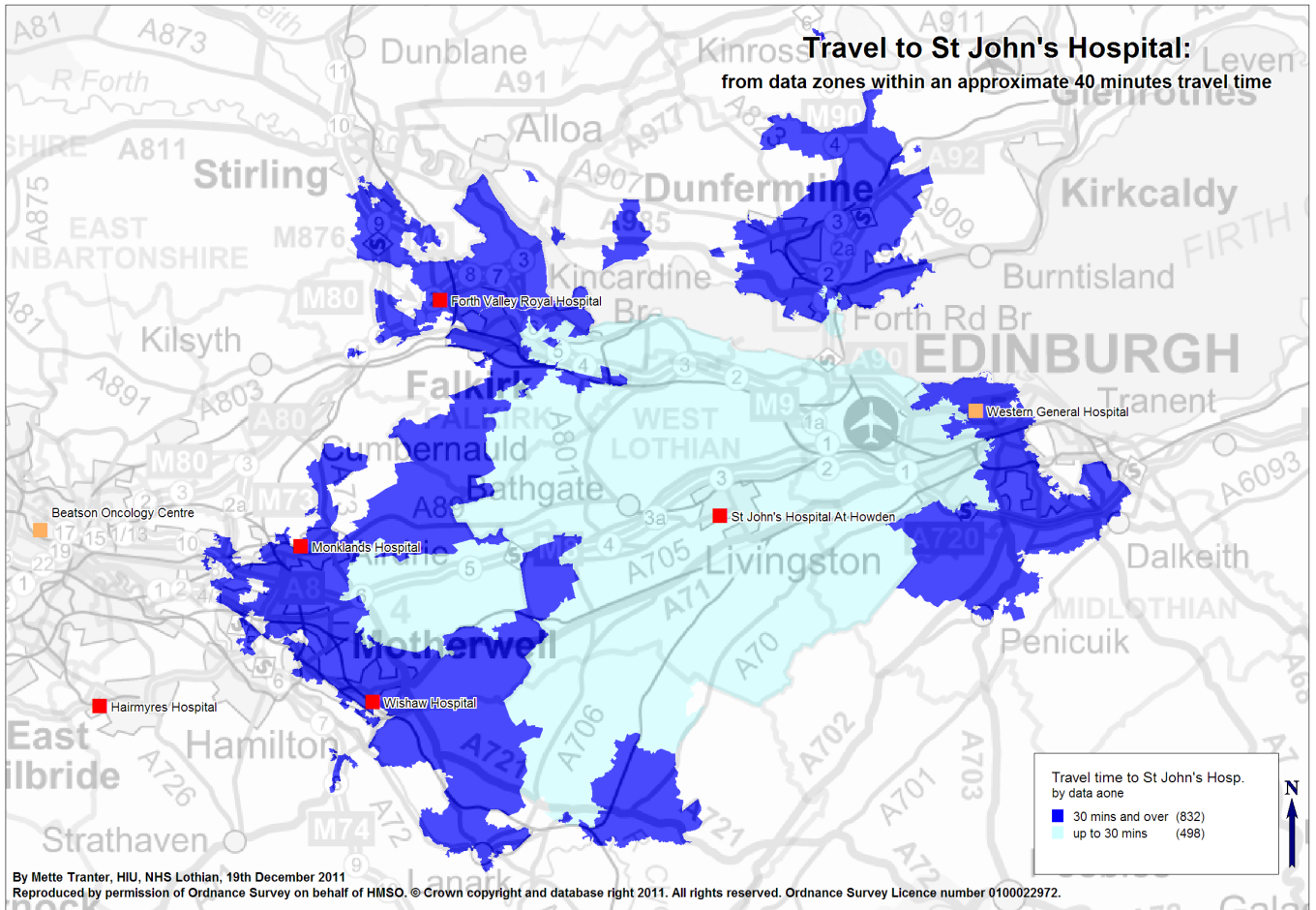
Appendix 4 – Projected LinAc Capacity Impact on Existing Cancer Centres from 2017 and 2022 Incidence



Appendix 5 – Anticipated 30 mins and 40 mins car travel time boundaries







Appendix 6 – Additional Information for Site Options Appraisal

Forth Valley Royal Hospital

Option Appraisal Topic	Question	Yes	No	Additional Information
Clinical Benefit	Are you currently providing chemotherapy treatment for the 4 main tumour sites – Breast, Lung, Genitourinary and Colorectal?	Yes		FVRH Chemotherapy Day Unit provides almost all day chemotherapy for FV population for 4 common tumour sites and also Haematological cancers.
	If no for any of the sites, would you intend establishing chemotherapy treatment if the satellite facility was chosen to be based at this site?			
	Do you have a 24 hour A&E service at this site?	Yes		
	Do you have digital x-ray and CT scanning facilities at this site?	Yes		
	Do you have an ITU service at this site?	Yes		Critical care unit comprises ITU and HDU
Patient Access	Would additional car parking capacity be required to support the satellite facility?	Possibly		The site is well provided for with car parking facilities; however at peak times there may be a need to consider additional provision. Whilst there is space to provide additional car parking, this would depend on the local authority granting planning permission
	Would the facility be easily accessible by public transport (bus and rail) within the agreed 30 min car travel time boundary? Please provide 4 examples of potential public transport travel arrangement from 4 points on the boundary – North, South, East and West of the facility using Traveline.	Yes		Excellent provision of bus services into the hospital site from across FV and beyond. New routes provided by NHS FV and existing routes altered to travel into hospital bus stance area, adjacent to main entrance. Train station located 15 minutes walk away with, regular bus service and free bus transfer for train users on certain services. (see attached sheet). Traveline Scotland sample journeys are also attached
	How often do buses and trains arrive at your hospital?			Between 0800 and 1800, buses arrive and leave every few minutes (see attached sheet). Train services to Larbert station between 15 and 30 minutes for most services (see attached sheet)
	What time does the last bus arrive at your hospital?			23.25pm
	What time does the last bus leave your hospital?			23.28pm
Strategic Fit	Does your site have the footprint capacity for a 3 LinAc – 4 Bunker facility and the ability to expand if required to a 4 LinAc – 5 Bunker facility?	Yes		

	Have you experienced difficulty in recruiting key clinical staff at your site – please provide examples.	No		
	Can you provide a brief profile of current relevant education and research provision at this site, which may work to support this development?			<p>Scottish Clinical Simulation Unit at FVRH – purpose built multi-disciplinary training facility plus only high fidelity simulation centre in Scotland. Provides the closest situation to real life without any risk to patients or learners.</p> <p>On site learning centre with lecture theatre, meeting rooms, training rooms, postgraduate education, clinical skills lab and library.</p> <p>In-House education and training provision – multi-disciplinary and uni-disciplinary, mandatory and non-mandatory, classroom and e-learning, supported by the Learning, Education and Training Strategy</p> <p>Research and Development Strategy in place and R & D Committee focussed on increasing quantity and volume of research, ensuring research quality and increasing the reputation of FV R & D.</p>
	Are there any anticipated exceptional costs associated with the location e.g., required demolition, asbestos decontamination, extensive structural work?	No		

Monklands Hospital

Option Appraisal Topic	Question	Yes	No	Additional Information
Clinical Benefit	Are you currently providing chemotherapy treatment for the 4 main tumour sites – Breast, Lung, Genitourinary and Colorectal?	√		Breast, lung, colorectal at Monklands. Genitourinary done at Wishaw.
	If no for any of the sites, would you intend establishing chemotherapy treatment if the satellite facility was chosen to be based at this site?	√		Possible – there is on-going review of day unit capacity and casemix.
	Do you have a 24 hour A&E service at this site?	√		
	Do you have digital x-ray and CT scanning facilities at this site?	√		New replacement CT scanner being installed before the end of March 2012. New MRI commissioned July 2011.
	Do you have an ITU service at this site?	√		
Patient Access	Would additional car parking capacity be required to support the satellite facility?		√	New 160 space car park opened Jan 2012, and parking capacity on-site will be significantly improved with closure of Airdrie health centre July 2012.
	Would the facility be easily accessible by public transport (bus and rail) within the agreed 30 min car travel time boundary? Please provide 4 examples of potential public transport travel arrangement from 4 points on the boundary – North, South, East and West of the facility using Traveline.			Cumbernauld to Monklands – 31 minutes by bus Uddingston to Monklands – 45 minutes by bus/train Merchant City (Bellgrove) to Monklands – 15 minutes by train Bathgate to Monklands – 27 minutes by train
	How often do buses and trains arrive at your hospital?			Buses Buses arrive at Monklands every 10 minutes 9am – 5 pm and every 20/30 minutes thereafter Trains Train every 30 minutes
	What time does the last bus arrive at your hospital?			First Bus arrives 0613 First train arrives 0622
	What time does the last bus leave your hospital?			Last bus leaves 22.04 Last train arrives 2250
Strategic Fit	Does your site have the footprint capacity for a 3 LinAc – 4 Bunker facility and the ability to expand if required to a 4 LinAc – 5 Bunker facility?	√		See architect's report
	Have you experienced difficulty in recruiting key clinical staff at your site – please provide examples.		√	Recent advert for ED consultant posts resulted in 9 appointable candidates, but this can vary by specialty.
	Can you provide a brief profile of current relevant education and research provision at this site, which may work to support this development?			

	Are there any anticipated exceptional costs associated with the location e.g., required demolition, asbestos decontamination, extensive structural work?		√	A – will be cleared by end of 2012 B – possibly vacated by end 2013, demolition required C – relocation/demolition of existing admin functions would be required, but certainly possible.
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St John's Hospital

Option Appraisal Topic	Question	Yes	No	Additional Information
Clinical Benefit	Are you currently providing chemotherapy treatment for the 4 main tumour sites – Breast, Lung, Genitourinary and Colorectal?	YES		St John's Hospital provides chemotherapy for all of the main tumour sites listed with the exception of lung
	If no for any of the sites, would you intend establishing chemotherapy treatment if the satellite facility was chosen to be based at this site?	YES		Lung chemotherapy could be introduced with the support of medical input and supervision provided by oncology
	Do you have a 24 hour A&E service at this site?	YES		
	Do you have digital x-ray and CT scanning facilities at this site?	YES		
	Do you have an ITU service at this site?	YES		
Patient Access	Would additional car parking capacity be required to support the satellite facility?	YES		See site appraisal report
	Would the facility be easily accessible by public transport (bus and rail) within the agreed 30 min car travel time boundary? Please provide 4 examples of potential public transport travel arrangement from 4 points on the boundary – North, South, East and West of the facility using Traveline.	YES		North (Linlithgow) First Bus. Last bus arrives 19:10, last departs 20:13, hourly service. West (Bathgate) First Bus. Last bus arrives 17:45, last departs 18:34, 30 minute service East (Edinburgh City) First Bus. last bus arrives 01:05, departs 22:37 30 minute service East (RIE Hospital) E&M Horsburgh. Last bus arrives 21:22, departs 19:20 hourly service. Scotrail service from Edinburgh with 2 short bus journeys. Depart every 45 minutes until after 10pm
	How often do buses and trains arrive at your hospital?			
	What time does the last bus arrive at your hospital?			
	What time does the last bus leave your hospital?			
Strategic Fit	Does your site have the footprint capacity for a 3 LinAc – 4 Bunker facility and the ability to expand if required to a 4 LinAc – 5 Bunker facility?	YES		Option 1 limited expansion due to site constraints; boundary/ internal roads. Option 2 has most potential for expansion.
	Have you experienced difficulty in recruiting key clinical staff at your site – please provide examples.	NO		
	Can you provide a brief profile of current relevant education and research provision at this site, which may work to support this development?			
	Are there any anticipated exceptional costs associated with the location e.g., required demolition, asbestos decontamination, extensive structural work?			Additional parking required to replace that lost through development and new facility requirement.

WoS Satellite Radiotherapy Facility: SCIM Design Statement

The business objectives for the project are to:

- Ensure available radiotherapy capacity is able to meet the anticipated rise in demand.
- Enable speedy access to modernised and integrated services.
- Improve the experience of access and engagement to radiotherapy services for people from deprived areas.
- Improve the convenience of access to radiotherapy services that are patient centred, safe and clinically effective.
- Provide improved access to modern planning techniques.
- Improve and maintain retention and recruitment of staff.
- Service users will see an improvement in the following:
 - The patient pathway for access to radiotherapy services.
 - Access to services both & treatment not previously available locally.
 - Radiotherapy services delivered closer to the patient’s home.

Therefore the success of the project is predicated on the following attributes being present in the completed development.

NB: Due to required adjacencies the facility will be provided on an acute site. Although the aspects described below relate solely to the radiotherapy facility, some aspects of the journeys, for some people, may be provided by utilising existing facilities or features (building/services/landscape) rather than by providing dedicated routes and amenities.

1 Non- Negotiables for Patients

Agreed Non-negotiables The performance specifications	Benchmarks The criteria to be met and/or a view of what success might look like
1.1 The facility, in its location and site layout, must support reliable and low stress access, particularly for: <ul style="list-style-type: none"> • People from deprived communities • People who would currently need to travel more than 45 minutes each way. • People with more limited transport options due to personal circumstances (no access to car or unable to drive). The location, design and layout must	Mapping will be carried out in site selection process to understand number of patients, and particularly patients from deprived communities, that will have improved journey times. In terms of the design of the facility, there should be: <ul style="list-style-type: none"> • Ease of access by car through proximity to main transport route (a major ‘A’ road or motorway within 5 mins of the facility) and reliable parking within 400m of the building entrance with a drop-off facility (see below). From the site entrance, the location of parking should be clearly identifiable, ideally by line of sight. The building entrance should be obvious and clearly identifiable from the car park and/or the route to parking so that wayfinding is intuitive. • Ease of access by public transport, with bus stop with services every 30 mins within 500m of the main building entrance with a clear, DDA compliant pedestrian route throughout the journey from the bus stop to

recognise that many patients will have reduced stamina/mobility and most will be required to repeat this journey daily for a number of weeks and therefore the ease and predictability of the journey from home to treatment and back has a significant impact on their experience of this stage of their treatment.

the building entrance.

- The pedestrian route from public transport, and from the street, should be clearly defined, barrier free (as in no steep hills or steps), feel safe (well lit/observed) and be sheltered from the prevailing winds. It should not be through the car park
- Drop off facilities (including patient transfer) to be within 10m of the entrance though not obscure the entrance (see note above). A covered area for 3 cars should be provided to shelter patients during transfer from vehicle to entrance.

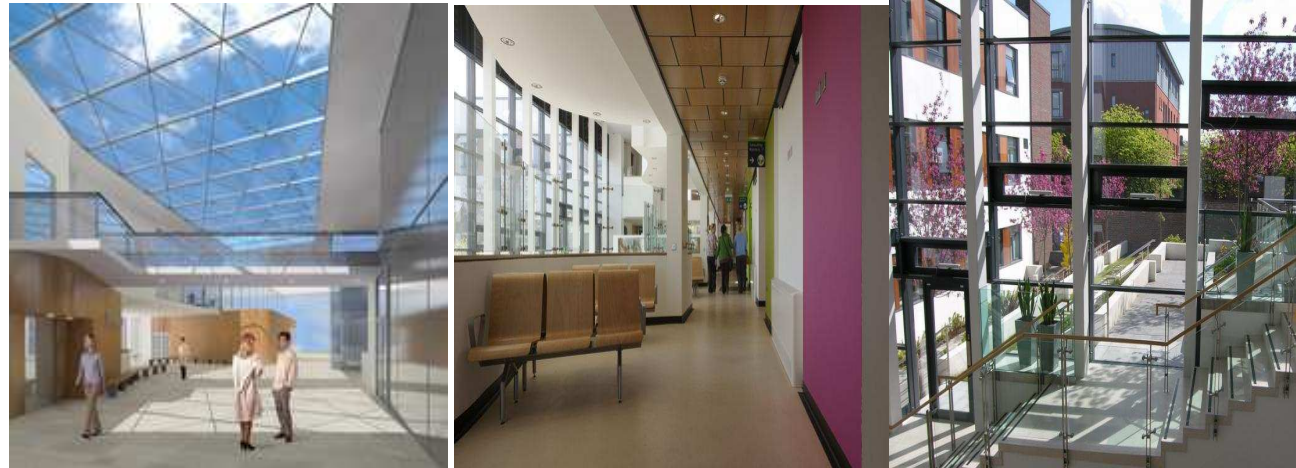


- Facilities should be available for those patients who may choose to cycle to the facility to enable them to park their bike.

If these routes are to be different to other routes used in other phases of treatment, then one should be identifiable from the other to aid familiarity in advance of the new treatment commencing.

1.2 The internal routes from the entrance (or entrances should broader site issues require) must provide immediate direction and easy transfer to a discrete area where “they know I’m here”, but patients do not feel on show when checking in and waiting, allowing them to maintain their privacy.

Clearly visible route from entrance, to facility reception and main waiting area with an overall travel distance from main entrance to waiting area of no more than 400m and cumulatively with the external distance from car park/bus stop no more than 600m. Routes should be well lit (daylight) and pleasant with graded privacy from public spaces (where you might be there for any reason) to private.





The design of the initial reception area must provide a professional and reassuring appearance (signalling the change in environment and modes of interaction from more public to private) and support private conversations.

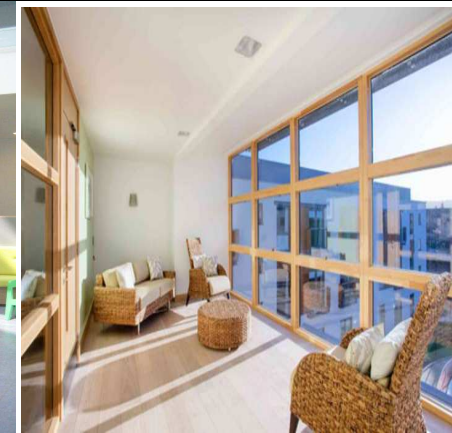


1.3 Waiting areas must support patients to:

- Choose to sit alone in privacy or to be in small group; either with those accompanying them or sharing the experience with others in a similar situation
- Be close to staffed areas to feel touch with help and information on any delays

- Waiting areas should not be on a through route for either patients or staff, or visible from public routes (considering also views in from external areas especially during darkness)
- The main waiting area (where you might sit for longer periods) should have daylight and an attractive external view. Furniture must be comfortable and arranged into groups so that you can choose where to sit. There should be a TV and an area for children to play. IT facilities (hard wired and Wi-Fi).

- Have positive distractions (age appropriate), and access to information on services and support.
- Deal with personal needs without worrying about missing their appointment.



- Any sub waiting areas, adjacent to treatment rooms, need not have views but comfortable seating and a means of positive distraction (such as art) are required.



- Toilets and access to refreshments must be available without having to leave the area.
- The interior design, by use of form, materials, lighting, colour and art, must present a 'soft' rather than clinical feel and control harsh, echoic sounds.

1.4 The treatment suite (room, route and changing areas) must feel private and calming and be arranged to facilitate different people's needs in terms of

changing. The thermal environment must be easily and responsively manageable to meet patients' personal needs. There must be positive distractions available to assist the patient while they are alone during treatment.



- There must be facilities to play music of patient's choice during treatment and visual interest within their field of vision during treatment.
- Local and responsive temperature controls to be provided.
- Facilities in the treatment room must allow for changing with some privacy (such as a screen and place to hang clothes, including wet over clothes) and for dressing again (mirror).
- There must be room near the treatment room (5m) for those who may take longer to change and would feel hurried if changing in the treatment room. There should be two changing rooms for each treatment area, one each for pre and post treatment. The route from such changing to the treatment room not being through main waiting areas or other places where one might feel on show.

1.5 The journey out should be simple and familiar (from arrival route). From this

- Taxi/car pick up points should not be in a different place to drop-off points such that patients are

<p>route there should be easy access to additional amenities to support the human needs of those awaiting transport, further appointments, or who need a moment before journeying onward.</p>	<p>required to take a different route on their return journey.</p> <ul style="list-style-type: none"> • There should be cafe facilities provided that offer a view of pick/up locations so that you can await taxi/car/bus in a warm, sheltered and comfortable environment without worrying you've missed your lift. • There should be easy access to attractive sheltered external grounds to allow a breath of fresh air, therapeutic respite (a moment to yourself or a place for a chat).
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2 Non- Negotiables for Staff

Agreed Non-negotiables The performance specifications	Benchmarks The criteria to be met and/or a view of what success might look like
<p>2.1 The experience of arriving must feel safe in daylight and darkness, be reliable and provide easy access to facilities needed to prepare for duty and reach their station/consult room.</p>	<ul style="list-style-type: none"> • Good public transport links - see 1.1 above. • Reliable parking for those who cannot reasonably use public transport within 800m walk of entrance • Routes from parking and busses well lit and observed • Staff changing facilities (separated by gender) located such that total transfer distance from building entry to changing (where relevant) to work location doesn't exceed 400m • Bookable consulting rooms for use by 'inreach' staff.
<p>2.2 The facility in its own provision and in its relationships with other cancer services on the site must facilitate and support new modes of treatment and care. A facility must be able to support the safe delivery of concomitant chemotherapy and emerging therapies.</p>	<ul style="list-style-type: none"> • Space should be available within the facility to accommodate future development. • IT services must be provided in staff and consulting areas to support the development of telemedicine including remote consulting and support both to patients in their own home and inter-site support.
<p>2.3 The layout of the facility must support integration and communication between disciplines and the development of a shared ethos, primarily within the radiotherapy service but also with colleagues in other areas.</p>	<ul style="list-style-type: none"> • Like activities (such as desk based work) and common facilities (staff circulation routes, data storage, photocopier etc) should be provided together rather than divided by discipline. These to be located so that they're readily accessible (5 mins max walk for most areas and 3 mins max for planning room) from clinical working areas, so that staff are routinely brought together in their normal working day. • Rest/lunch facilities should be located and designed to encourage use by all staff; being attractive places to gather for routine and special occasions (leaving do), and for informal study/work, extending

their use out with break times. (see also 2.6 below)



- Formal CPD/training facilities and larger meeting rooms must be located on site and within 5-10 minute walk of the facility. Ideally support facilities such as training areas etc would be shared between staff of different cancer services to support the development of a shared ethos and informal communication.

2.4 The design of staff working areas must support staff to carry out the necessary tasks in an efficient manner and must also communicate the value placed on them.

- Unless disallowed due to technical requirements, daylight and an external view to be provided in every space where staff would routinely spend time.
- Clinical areas must be designed so that staff movement is easy and efficient (such as desks etc don't get in the way or regular routes)
- Each bunker/treatment room should have an available clinical room to support patient consultations pre treatment.
- Adequate storage must be provided close to the point of need.
- Office area(s) should be designed flexibly, with spaces nearby for sensitive/confidential phone calls or conversations. And IT facilities should support personal choice in working environment (see 2.3 above regarding use of social facilities).

Each bunker/treatment room will require 2 consulting rooms to be designed flexibly, light and airy with good visual and audio privacy to the outside.

2.5 The layout of the facility must support the engineering functions and the transfer/storage of supplies/waste necessary for the operation/replacement of the linacs to be managed easily and

- Site layout to provide route and space for regular large deliveries, the storage/collection of waste, and for the crane necessary for replacement of technical kit, adjacent to technical areas and away from main public routes.
- Internal routes to be wide enough to transfer heavy equipment and machinery to and from external locations.

generally out of sight of patients.

- Engineering lab to be within 2 mins of linacs

2.6 The facility must support staff's personal needs.

- There should be an attractive place to have, prepare and eat a light lunch within 5 minutes of working stations. The design of this space must allow for personal choice in either coming together as a group, or taking a moment apart. See also 2.3 above.
- Wi-Fi facilities should be provided to allow staff to keep in touch with personal issues (take texts/check e-mails etc)
- There should be, on site, an external space to allow staff to stretch legs and take a breath of fresh air. This can be shared with other staff/public (inc any facilities developed to allow exercise) however a sheltered space accessible from rest areas would be most convenient.



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3 Non-Negotiables for Visitors (those accompanying patients)

Many of the needs of visitors are consistent with those of patients (see section 1 above) therefore only additional aspects are described below.

Agreed Non-negotiables The performance specifications	Benchmarks The criteria to be met and/or a view of what success might look like
3.1 The facility must have space to accommodate and occupy dependants (particularly accompanying children) while patients are being treated without negatively impacting the experience of other patients.	Discreet area for children.
3.2 The provision of support information and services for carers must be clearly signposted during the journey to/from waiting areas.	<ul style="list-style-type: none"> • See 1.3 above in terms of IT facilities. • Other support services, such as any maggies on site, should be signposted from the route described in section 1.

4 Alignment of investment with policy

Agreed Non-negotiables The performance specifications	Benchmarks The criteria to be met and/or a view of what success might look like
4.1 The layout of the site must allow for expansion of this facility, whilst not impeding the adaptability of the host facility.	It is imperative that both the site and the facility are capable of adapting to accommodate changing demographic needs, potential service change or rise in demand. Any increase in capacity and size should avoid further impact on the localised and immediate environments.
4.2 The placing of the new facility must be such that: <ul style="list-style-type: none"> • It is recognisable in the everyday routes around the host site • It is a positive and respectful addition to the host site and 	Landscaping design used to make the development feel “soft”. Spaces where Low maintenance a requisite.

enhances the patient experience	
4.3 The facility must be sustainable in its use of energy and materials.	NHS Ayrshire & Arran, NHS Forth Valley, NHS Greater Glasgow & Clyde, NHS Highland (Argyle & Bute) and NHS Lanarkshire aim to achieve a BREEAM “Excellent” Rating for this project through design assessment and guidance. This will be detailed at OBC stage onwards.
4.4 The new facility must map into and be supportive of the host sites Property and Asset Management Strategy.	Contribute to NHS Scotland’s shared target for reduced carbon emissions.

Stakeholders involved in preparation of the design statement

Ms Heather Knox	- Director of Regional Planning	Dr David Dunlop	- Clinical Director, Beatson Cancer Centre
Dr Garry Currie	- Head of Physics, Beatson Cancer Centre	Mr Alan McCubbin	- Head of Finance – Capital Planning
Mr Colin Lauder	- Head of Planning & Development	Ms Jan Anderson	- Patient Representative
Ms Elizabeth Bruce	- Patient Representative	Ms Elizabeth Stow	- Society of Radiographers
Mr Gary Jenkins	- General Manager	Ms Jeanette Fraser	- Senior Planning Manager
Ms Diane Fraser	- Project Manager	Mr John Donnelly	- Head of Capital Planning
Mr Gordon McLean	- Service Improvement Manager		

5 Self Assessment Process

Decision Point	Authority of Decision	Additional Skills or Other Perspectives	How the above criteria will be considered at this stage and/or valued in the decision	Information needed to allow evaluation
Site selection	Decision by WoSRPG with advice from Project Board.		Risk/benefit analysis considering the capacity of the sites to deliver a development that meets the criteria above.	Site feasibility studies (including sketch design to RIBA stage B) for alternate sites or completed masterplan (for site with the potential for multiple projects). Cost estimates (both construction and running costs) based on feasibility.
Completion of brief to go to market	Decision by WoSRPG with advice from Project Board.	Peer review by colleague with no previous connection to project.	Is the above design statement included in the brief? Can the developed brief be fulfilled without fulfilling the above requirements?	
Selection of Delivery/Design team	Decision by Project Board with advice from the Project Manager.	HFS Framework Scotland	The potential to deliver 'quality' of the end product in terms of the above criteria shall be greater than the aspects of the quality of service in terms of delivery. Compliance with service standards (such as PII levels etc) shall be criteria for a compliant bid & not part of the quality assessment.	Sketch 'design approach' submitted with bid (the stage & detail of these to be appropriate to procurement route chosen) Representatives will visit 2 completed buildings by Architects in shortlisted team, to view facility & talk to clients.
Selection of early design concept from options developed	Decision by WoSRPG with advice from Project Board.	Comment to be sought from NDAP	Assessment of options using AEDET or other methodology to evaluate the likelihood of the options delivering a development that meets the criteria above	Sketch proposals developed to RIBA Stage C coloured to distinguish the main use types (bedrooms, day-space, circulation treatment, staff facilities, usable external space). Rough Model
Approval of Design Proposals to be submitted to planning authority	Decision by WoSRPG with advice from Project Board.		Assessment of options using AEDET or other methodology to evaluate the likelihood of the options delivering a development	

			that meets the criteria above	
Approval of detailed design proposals to allow construction	Decision by WoSRPG with advice from Project Board.		Assessment of options using AEDET or other methodology to evaluate the likelihood of the options delivering a development that meets the criteria above	
Post occupancy evaluations	Consideration by WoSRPG – lesson fed to SGHD		Assessment of completed development by representatives of the stakeholder groups involved in establishing the above against goals they set.	