Golden Jubilee Foundation

Patients at the heart of progress

Hospital Expansion Programme

Phase Two: Orthopaedic and Other Surgical Specialties Expansion

Initial Agreement

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1 Overview

1.1 Introduction

The Golden Jubilee Hospital (GJH) is within the Golden Jubilee Foundation (GJF) and is a Special Health Board, providing regional and national services, the hospital supports all Health Boards in Scotland. The GJH's vision is to be a world leader in quality, research and innovation for healthcare. We have a strong track record in the delivery of safe, effective and person-centred health care and work in partnership with all NHS Boards to provide essential services to patients. All services are located on the GJH site, located in Dalmuir, an area on the western side of Clydebank, in West Dunbartonshire.

The hospital is home to regional and national heart and lung services, we are the only site in Scotland to undertake heart transplantation. As the largest single-site elective Orthopaedic Centre in Scotland, we perform over 25% of all Scottish hip and knee replacements. Following the most recent expansion in Ophthalmology (undertaken in 2017), we will perform over 15% of all cataracts in Scotland during 2017/18. The recent rapid growth of elective surgical services at the Golden Jubilee Hospital has resulted in the hospital being fully utilised with no remaining space to increase surgical capacity.

1.2 Expansion Programme Phasing

It is acknowledged there will be a significant growth in demand for elective surgical care over the next 25 years and the specialties of ophthalmology and orthopaedics are likely to continue to experience some of the most significant increases in demand. In meeting this demand the GJF has been tasked by Scottish Government with planning the elective care requirements of the West Region population between now and 2035. As a National Board currently supporting every Health Board in Scotland, GJF will also engage with the North and East Regions to ensure there is continued support for each Health Board as necessary and to ensure there is robust capacity planning for additional elective care requirements to meet the predicted need for NHS Scotland by 2035.

It is also noted that there is a significant number of patients currently treated within the private sector due to lack of capacity within the current system, that require to be treated within the NHS

The GJF expansion programme is structured two phases as follows:

- Phase One – delivery of additional ophthalmology elective care capacity
- Phase Two – delivery of additional orthopaedic and other surgical elective care capacity

The West of Scotland (WoS) population as defined in the National Project Initiation Document (PID) are those residents living in the following Health Board areas:

- NHS Greater Glasgow and Clyde
- NHS Ayrshire and Arran

- NHS Lanarkshire
- NHS Forth Valley
- NHS Dumfries and Galloway.

The Health and Social Care Delivery Plan acknowledges these challenges in secondary care and has committed by 2021 to complete investment in new elective treatment capacity and expanding the Golden Jubilee with an aim to ensure there is high quality and adequate provision of elective care services to meet the needs of an ageing population.

The purpose of this IA is two fold:

1. **to describe the need for additional elective capacity to meet the current and future additional demand for orthopaedic and other surgical specialties for the population of the WoS**
2. **to identify the solutions to deliver this demand**

The proposed phase 2 expansion will provide the necessary additional orthopaedic and other surgical capacity to meet the needs of the WoS population between now and 2035. The IA will do this by responding to the following questions:

Figure 1: Structure of the Initial Agreement

	Initial Agreement (IA) – Hospital Expansion Programme Phase 2		
	Question	**Response**	
Executive Summary	What is the proposal about?	Prepare Executive Summary of responses to the following questions.	See section 2
Strategic Case	What are the current arrangements?	Outline existing: • Service details • Service arrangements • Service providers • Associated building & assets	See Sections 3.1, 3.2, 3.3 and 3.4
	Why is this proposal a good thing to do?	Outline: • Need for change • Investment objectives • Benefits register • Risk management strategy	See Sections 4.1 to 4.7 and section 4.8
Economic Case	What is the preferred strategic/service solution?	.Confirm: • Stakeholder engagement • The Do Nothing/Minimum option • Service changer proposals • Indicative costs • Assessment of proposed solutions • Preferred strategic/service solutions • Design Quality objectives	See Section 5.1, 5.2, 5.3, and 5.4
Commercial, Financial & Management Cases	Is the organisation ready to proceed with the proposal?	.Confirm: • Procurement Strategy & timetable • Affordability & financial consequences • Governance & Project management arrangements	See Sections 6.1, 6.2, 6.3 and 6.4
Conclusion	Is this proposal still important?	Update: • Strategic Assessment	See section 7

2 What is the Proposal About?

	Question	Response
Executive Summary	What is the proposal about?	Prepare Executive Summary of responses to the main IA questions.

2.1 Summary of the Need for Change

The need for change is influenced by many factors:

- The rising retirement age, to 67 and beyond and the increased number of people aged over 70 living more active lives, resulting in rising rates of intervention
- Demographic change – the growth in population and more importantly the significant increase in the proportion of people aged over 60

These changes have resulted in significant and growing service pressures in orthopaedics and other surgical specialties. As a result waiting lists in orthopaedics have risen significantly in the West of Scotland during the last year, making it difficult for many NHS Boards to deliver NHS Scotland waiting time targets.

Actual Demographic Change

Between 2005 and 2015, the WoS Population increased by 2.8% from 2,553,860 to 2,627,290, the number of people aged over 60 increased by 24% - (from 551,195 to 684,601). The ageing population within the WOS has significantly increased the demand for orthopaedic and other surgical specialities over the last 10 years.

Forecast Demographic Change

Between 2015 and 2035 the WoS population is forecast to grow by 1.6%, a population increase of 42,011. However more significantly:

- **The number of people aged 60 plus is predicted to increase by 34.8%, an increase of 218,670 people aged over 60 by 2035**
- **The number of people aged 70 plus is predicted to increase by 56%, an increase of 183,959 people aged over 70 by 2035**

It is important to note that that age at time of intervention will be a key factor in forecasting the potential additional demand for surgical procedures, for example:

- 84% of patients undergoing primary knee replacement are aged over 60 years old at the time of intervention
- 80% of patients undergoing primary hip replacement are aged over 60 at the time of intervention
- approx 40-50% of urology patients are aged over 60 years old at the time of intervention
- approx 30-40% of general surgery patients are aged over 60 at the time of intervention.

To ensure the demand modelling is accurate age at time of intervention has been factored into the demand modelling methodology. See section 4.2 for further explanation.

Current Waiting Time Pressures

There are significant waiting times pressures within Orthopaedics across the West of Scotland, improvements in productivity cannot possibly meet all of the predicted additional demand (see section 4.1.2 for further information).

Waiting time pressures have also grown in general surgery and urology – pressure has increased significantly within the last 12 months this is illustrated in the graphs within section 4.1.2.

Overall waiting time pressures have continually grown in recent years and there is a requirement to provide both improved clinical productivity and additional capacity to meet demand.

Current Service Provision at GJH

The GJF orthopaedic service was established over 13 years ago, in recent years in response to the national demand for orthopaedic surgery, the service has undergone rapid expansion. Figure 2 illustrates the continual service expansion year on year between 2003/4 and 2016/17.

At present the GJF provides over 25% of all primary hip and Knee procedures within NHS Scotland. In addition the service provides a comprehensive revision arthroplasty service supporting Island Boards with the more complex revision patients and is the sole provider of revision arthroplasty for patients residing within NHS Dumfries and Galloway patients. Over the last 12 years the service has grown significantly to support the growing demand for orthopaedic services across NHS Scotland.

NHS GJF also provides General Surgery and Endoscopy programmes, there is no provision for urology services at the GJF.

As part of this proposal and to understand the overall volume of predicted future demand for the high volume surgical specialities within the West region, following significant engagement with the West Health Boards Engagement Group, demand modelling has been carried out for the following specialties and sub specialities:

- Orthopaedic surgery including:
    - Primary Arthroplasty,
    - Revision arthroplasty,
    - Foot and ankle
    - Hand and Wrist
    - Shoulder and Elbow
    - Minor lower leg procedures
- General Surgery
    - all elective surgical procedures
- Urology
    - all elective surgical procedures
    - Cystoscopies
- Endoscopy
    - Diagnostic
    - Therapeutic

It is important to note that whilst demand modelling has been carried out for Urology and shoulder and elbow surgery – (services not currently provided at the GJF), this was specifically to understand the entire elective picture within the region. There is no suggestion that the GJF should provide these services. Significant work has been undertaken to develop a regional model for Urology within the West region which will support the future requirements for Urology within the region. Similarly, given the relatively small predicted increases in shoulder and elbow surgery it would be more appropriate for the GJF to provide additional primary arthroplasty capacity to enable the West Health Boards to deal with the forecast increased local demand for shoulder and elbow surgery.

Use of the Private Sector

There remains significant use of the private sector providers to support orthopaedic, general surgery and endoscopy procedures. Section 3.1 Provides an overview of the spend and activity levels in the Private sector in 2014/15.

Opportunities for Improvement

There are considerable waiting time pressures across the West of Scotland within Orthopaedic surgery, General Surgery and Endoscopy. Section 4.1.2 outlines the current waiting time pressures in Scotland and the West region as at Jan 2018. Pressures are significantly higher within Orthopaedics surgery therefore a large proportion of the GJF expansion will support provision of additional elective orthopaedic surgery for the West of Scotland Region.

Predicted Additional Demand for Orthopaedic Surgery, General Surgery and Endoscopy and the Proposed Solution

This IA outlines the clear requirement for significant additional orthopaedic capacity as well as additional endoscopy and general surgery capacity. Section 5.4 provides further details of the proposed solution.

Key Benefits of this Proposal

Through a workshop approach, the key benefits of this proposal were identified and summarised in a benefits register (see Figure 73), for each benefit a baseline value and an indicative target value have been identified. The benefits register will be reviewed and a benefits realisation plan will be developed as part of the OBC process.

Strategic Risks of this Proposal

During a risk management workshop the key strategic risks have been identified and each risk has been assessed to consider its impact. A description of each of the risks, together with the current treatment / mitigation actions in place have been documented in appendix A7

Further details of the preferred solution, its cost and the risks and benefits are set out in sections 4, 5 and 6 of this IA.

Indicative costs of the preferred solution

Two preferred solutions have been identified. In identifying the preferred solutions the statements of intent from East and North Health Board to repatriate orthopaedic activity has been considered. Confirmation of volume and timing of repatriation of orthopaedic activity to the North and East Health Boards will facilitate the confirmation of the final preferred option.

The indicative capital costs (including optimism bias) and revenue costs for the preferred solution (s) are as follows:

Option 2 – capital cost £76m, additional revenue costs over the 17 year period are £32.73m

Option 3 - capital cost £80m, additional revenue costs over the 17 year period are £35.3m

Governance and Project Management Arrangements

Section 6 provides an overview of the programme and project governance arrangements in support of this proposal. During the process of developing the IA the strategic assessment (SA) has been reviewed to confirm that the original need for change and benefits identified at the SA stage remain valid.

Stakeholder and Governance Support for this Proposal

Section 6.3.2 provides a summary of the engagement that has taken place to date with all key stakeholder groups and organisations, together with a summary of their support for this proposal.

3 What are the Current Arrangements?

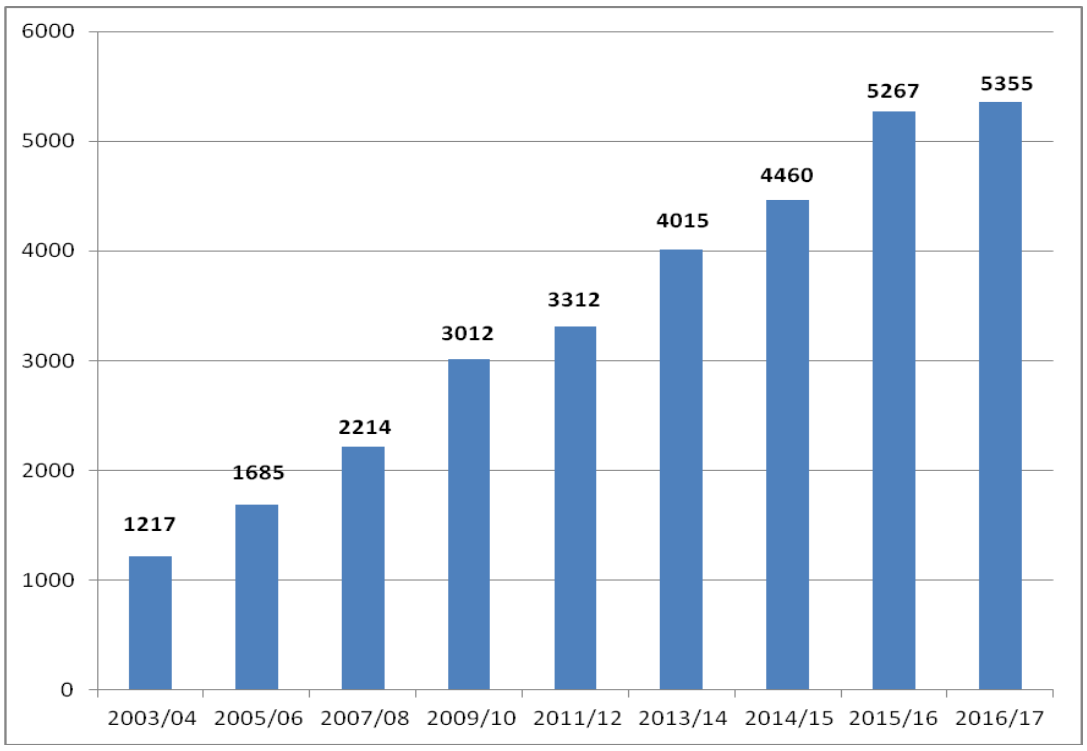
	Question	Response
Strategic Case	What are the current arrangements?	Outline current: • Service details • Service arrangements • Service providers • Associated buildings & assets

3.1 Current Service Provision

The GJF provides Orthopaedic, General Surgery and Endoscopy services to 13 Health Boards across Scotland, supporting almost all NHS Boards with Orthopaedics.

In response to the national demand - the GJF orthopaedic service has grown more than four fold in the last 12 years as illustrated in the graph below. Growth reached a plateau in 2016/17 as a result of all GJF facilities being fully utilised.

Figure 2: Growth of the Golden Jubilee Orthopaedic Service - Actual Procedures performed 2003/04 – 2016/17



In addition to the expansion of the service at GJF, NHS Boards have also accessed private sector capacity. Figure 3 provides an overview of the recent use of private sector capacity in NHS Scotland and in the West Region in 2014/15.

Figure 3: Use of Private Sector capacity in 2014/15

Specialty	All of NHS Scotland		West Region Only	
	Activity	Cost	Activity	Cost
General Surgery (Including Vascular)	1028	£2,570,213	171	£428,000
Endoscopy	3111	£13,706,521	261	£261,264
Orthopaedics	1493	£3,111,610	469	£3,519,528
Total	**5632**	**£19,388,344**	**901**	**£4,208,792**

Figure 4: Summary of GJF Capacity Allocations by Board 2017/19

Referring NHS Board	Orthopaedics		General Surgery	Endoscopy
	New Out Patients	All Procedures	Procedures	Procedures
Ayrshire & Arran	1162	525		70
Borders	100	100		
Dumfries& Galloway	452	328		
Fife	120	60		
Forth Valley	1280	656	60	350
Greater Glasgow & Clyde	705	705	80	
Grampian	214	150	150	
Shetland	150	150		
Highland	233	233		
Lanarkshire	1734	815	400	1430
Lothian	1089	903	100	n/a
Tayside	650	335		
Western Isles	45	45		
Total	**7,934**	**5,005**	**790**	**1,850**

Provision of Orthopaedic Support to NHS Shetland – Use of Video Conferencing for New Outpatients

Approximately 3 years ago the GJF began to support NHS Shetland, significant vacancies and growing waiting time pressures within NHS Grampian meant they were no longer able to provide the same level of orthopaedic service support to NHS Shetland. NHS GJF now provide the entire lower limb orthopaedic service for NHS Shetland, initially this was through a traditional model whereby GJF consultants travelled to Shetland, however working in partnership with NHS Shetland a new clinical model has been developed - all new consultations are now via Video Conferencing,. This offers many benefits:

- The service is more patient centred – Instead of one clinic every 12 weeks, the VC clinics are routinely timetabled within consultants job plans and take place several times per month offering patients a much greater choice of appointments and improving the ability to manage waiting times
- The new clinic model makes much more effective use of each consultant orthopaedic surgeons time, no time is lost to travelling
- The service is far more cost effective than the traditional model saving travel costs and travel time of the consultant, this also means the consultant is available to support more of the core GJF work.
- Patient feedback has been very positive, patients now only travel for their treatment.(See section 4.3.1 detailing patient feedback to date)

Theatre & Clinic Operating Hours

Our five permanent orthopaedic theatres are fully utilised, operating Monday to Friday, 48.8 weeks per annum, (except on public holidays and education afternoons), in addition two of the five orthopaedic theatres are utilised routinely on Saturdays.

There are two general theatres, fully utilised, operating Monday to Friday 48.8 weeks of the year, general surgery and plastic surgery (they are also used once a week for orthopaedic minor surgery as our orthopaedic theatres are fully utilised).

The outpatient and pre operative assessment service operates Monday to Friday, 48.8 weeks per annum, (except on public holidays and education afternoons).

3.2 Current Facilities and Current Patient Pathway

The following key facilities are used to deliver the orthopaedic general surgery and endoscopy service:

Figure 5: Current Facilities and Accommodation - Orthopaedics, General Surgery and Endoscopy

Area	Locations
Outpatient accommodation	Outpatient accommodation is located on level 1 in the orthopaedic outpatient department adjacent to the main hospital entrance.
Pre operative assessment accommodation	The Pre-operative assessment area is within the main outpatient department on level 1 it is separated from orthopaedic outpatients as there is limited space available.
Reception and waiting areas	The main reception and waiting areas within the orthopaedic outpatient area is very constrained as the service has grown it has outgrown the available waiting space.
2 orthopaedic inpatient wards	Inpatient beds are located in Ward 2 East and Ward 2 West, both on Level 2. At present there are no designated general surgery inpatient beds, patients who do require to stay overnight are usually cared for within the level 2 or 3 inpatient wards depending on bed availability.
Surgical Day Unit	The SDU on level 3 provides space for admission of patients on the day of surgery and for admission and recovery of day case patients, this is a multi specialty space shared with all surgical specialities (cardiac, thoracic, general surgery, orthopaedic surgery).
Theatres	All theatres are located within the main inpatient theatre suite on level 3 of the hospital 5 orthopaedic theatres 2 general theatres used for – minor orthopaedics, general surgery and a small amount of plastic surgery. Note one of these theatres is now also used for minor orthopaedics once a week as the orthopaedic theatres are fully utilised. 1 endoscopy room with a relatively small pre and post op area for preparation and recovery of patients.
Office and support accommodation	The majority of administrative accommodation is located on level1 adjacent to the orthopaedic clinic, there is also some administrative space on level 4 within a disused inpatient ward area.

3.2.1 Existing Service Arrangements - Current Patient Pathways

Figure 6 provides an overview of the current models of care for orthopaedic surgery, General surgery and Endoscopy.

Figure 6: Summary of the Current Models of Care

Orthopaedic Surgery	Patients are referred by their GP to their local Health Board. Referrals are clinically vetted and sent onto GJF Visit 1 / 2 - Patients are seen by Consultant Orthopaedic Surgeon / Extended Scope Practitioner, if listed for surgery patients are pre operatively assessed. Depending on distance travelled this may be undertaken in the same visit or a second visit. (NB all NHS Shetland patients are seen via VC and have local pre operative assessment). Visit 2 / 3 - Patients undergo Surgery Arthroplasty post operative follow up – is led by arthroplasty practitioners and is undertaken at 6 or 12 weeks, 1 year 7 years and 10 years, either face to face or via VC. Maximum of 2 follow up appointment for foot and ankle patients (1 consultant led one nurse led). Where possible follow up is undertaken via VC.
General Surgery	The current service at GJF is a treat only service Patients have already been listed for a General surgery procedure before being referred to GJF for surgery. Patients undergo local pre operative assessment. Visit 1 – Patients are admitted for surgery If required post operative follow up is provided locally – however given the procedure type the patients are no longer followed up in outpatients.
Endoscopy	At present all the patients treated at GJF have been referred for a diagnostic endoscopy Patients have already listed for an endoscopy procedure are referred to GJF Visit 1 – Patients are admitted for Endoscopy Results of the endoscopy are shared with the local health Board and the patient on the day of their procedure. Patients are counselled by the consultant if any biopsies are undertaken and the consultant identifies any suspected cancer.

3.3 Current Clinical and Performance Outcomes

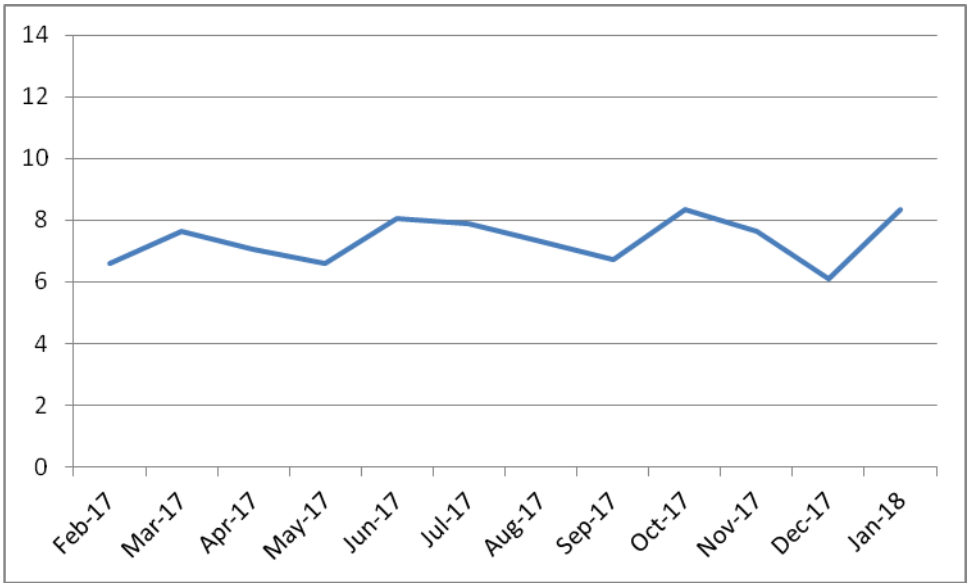
New Outpatient Clinic Conversion Rates

Orthopaedic surgery conversion rates vary from between 45% and 55%, averaging approx 50%.With the exception of NHS Shetland all referrals are clinically vetted by the referring board and sent to the GJF.

Clinic DNA Rates

NHS GJF has a target rate of less than 5% for all new outpatient appointments. DNA rates vary from month to month and also vary by Health Board of referral. The average DNA rate for both Treat and See and treat orthopaedic outpatient appointments combined between 1st Feb 2017 and 31st Jan 2018 was 6.58%. Figure 7 below provides a summary of the DNA rate for see and treat appointments between February 2017 and Jan 2018.

Figure 7: DNA Rates See and treat Orthopaedic Clinics Feb 2017 to Jan 2018



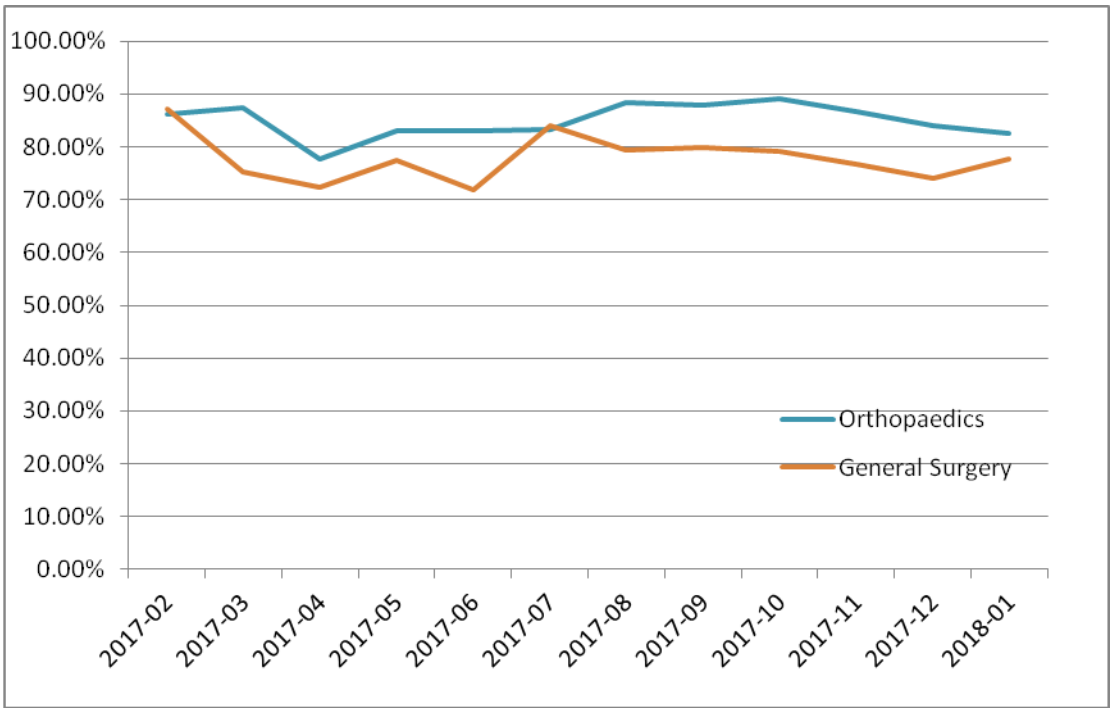
Theatre Utilisation

Orthopaedic theatre utilisation within GJF consistently performs above the National Theatre Implementation Group (NTIG) targets. Theatre utilisation within orthopaedics sits above 80% some months closer to 90% as illustrated in the Graph in Figure 8.

General surgery theatre utilisation is not quite as high as orthopaedic use – this can be attributed to the current service configuration – at present all outpatient consultations and pre operative assessment is

undertaken at the patients local hospital before the patient is referred to the GJF, this can sometimes lead to the cancellation of patients if their tests and investigations aren't available or haven't been completed prior to their referral. In addition the service is currently supported by visiting surgeons, who mostly undertaking half day not full day theatre lists which often means only 4 procedures are achieved in a day as opposed to five procedures (see section 3.3 highlighting general surgery theatre utilisation as a key area for improvement).

Figure 8: General Surgery and Orthopaedic Theatre Utilisation February 2017 to Jan 2018



Cancellation Rates

As you would expect within an elective care facility, orthopaedic cancellation rates on the day of surgery are very low at less than 4%. General surgery rates on the day of surgery range between 7% and 15%, this is partly due to the links with the heart and lung centre and the need to provide urgent and on call general surgery cover, which can sometimes mean an emergency patient interrupts a routine general surgery list. Additionally, patients are listed and pre operatively assessed in their local Board area for surgery and there is often a conflicting clinical opinion about whether surgery is required or not when the patient presents on the day of surgery at GJNH, and or whether al relevant tests and investigations are available and or have been completed prior to admission. If there was a substantive workforce delivering a sustainable general surgery service at GJNH there would be significant scope to improve the general surgery cancellation and productivity rate (see section 4.4 highlighting general surgery theatre cancellations as a key area for improvement).

Clinical Outcomes

'The Scottish Arthoplasty' report in 2017 identifies the GJH as the health Board performing the highest volume of primary arthroplasty with the lowest complication rates and the best clinical outcomes.

In summary, as part of the Outline Business Case (OBC) process the clinical models will be developed further, in particular the general surgery clinical team are focussed on delivering a significantly improved and 'best in class' model which will deliver potential further improvements against the current benchmarks set out above.

3.4 Current Facility - Condition and Performance

This IA is being developed to provide additional capacity as the hospital is fully utilised, there is no significant need for refurbishment or backlog maintenance as is common for many capital projects. Figure 12 provides a summary of the 2015 property asset management assessment; it confirms the current space utilisation at 100%.

The AEDET process has identified the 'Use' score and below the target score of 3 (5.5) this is a result of two key factors:

- the existing facility is not capable of handling the projected activity throughput, and:
- the fact that as a result of multiple previous service expansions, the current facility is already being used as flexibly as possible to deliver services and cannot respond to further service change to enable expansion

A new facility that is purpose built will enable the delivery of further innovation and improved patient flow and improve patient experience. In order to support further innovation there is a requirement for a new state of the art facility which supports 'best in class' or 'world class' models of care, facilitating improved patient flow, increased clinical productivity.

Figure 9: 2015 Hospital Property Asset Management (PAM) Assessment Summary

Category	Status as at 2015
Condition ranking	94% of hospital estate rated as A or B
Functional ranking	93% of hospital estate rated as A or B
Quality Ranking	93% of hospital estate rated as A or B
Space Ranking	All hospital space 100% fully

	utilised

4 Why is this proposal a good thing to do?

	Question	Response
Strategic Context	Why is this proposal a good thing to do?	Outline: • Need for change • Investment objectives • Benefits register • Risk management strategy

4.1 What is the need for change?

The need for change is influenced by many factors:

- The rising retirement age, to 67 and beyond and the increased number of people aged over 70 who continue to live active lives, resulting in rising rates of intervention
- Demographic change – the growth in population and more importantly the significant increase in the proportion of people aged over 60

These changes have resulted in significant and growing service pressures in the delivery of surgical services. As a result referrals and waiting times in orthopaedics, general surgery and endoscopy have risen significantly in the West of Scotland during the last year, making it difficult for many NHS Boards to deliver NHS Scotland waiting time targets.

4.1.1 Demographic change

Demographic changes and the increasing elderly population in Scotland has had a huge impact on demand for orthopaedics, general surgery and endoscopy services over the last 10 years.

Figure 10 provides an overview of the actual and forecast demographic changes for the population residing within the WoS Health Boards between 2005 and 2035. (Source: Office for National Statistics).

Actual demographic change between 2005 and 2015

Between 2005 and 2015, the WoS population increased by 2.8% (from 2,553,860 to 2,627,290) the number of people aged over 60 increased by 24% (from 551,195 to 684,601). The ageing population within the WoS has significantly increased demand for orthopaedic services over the last 10 years.

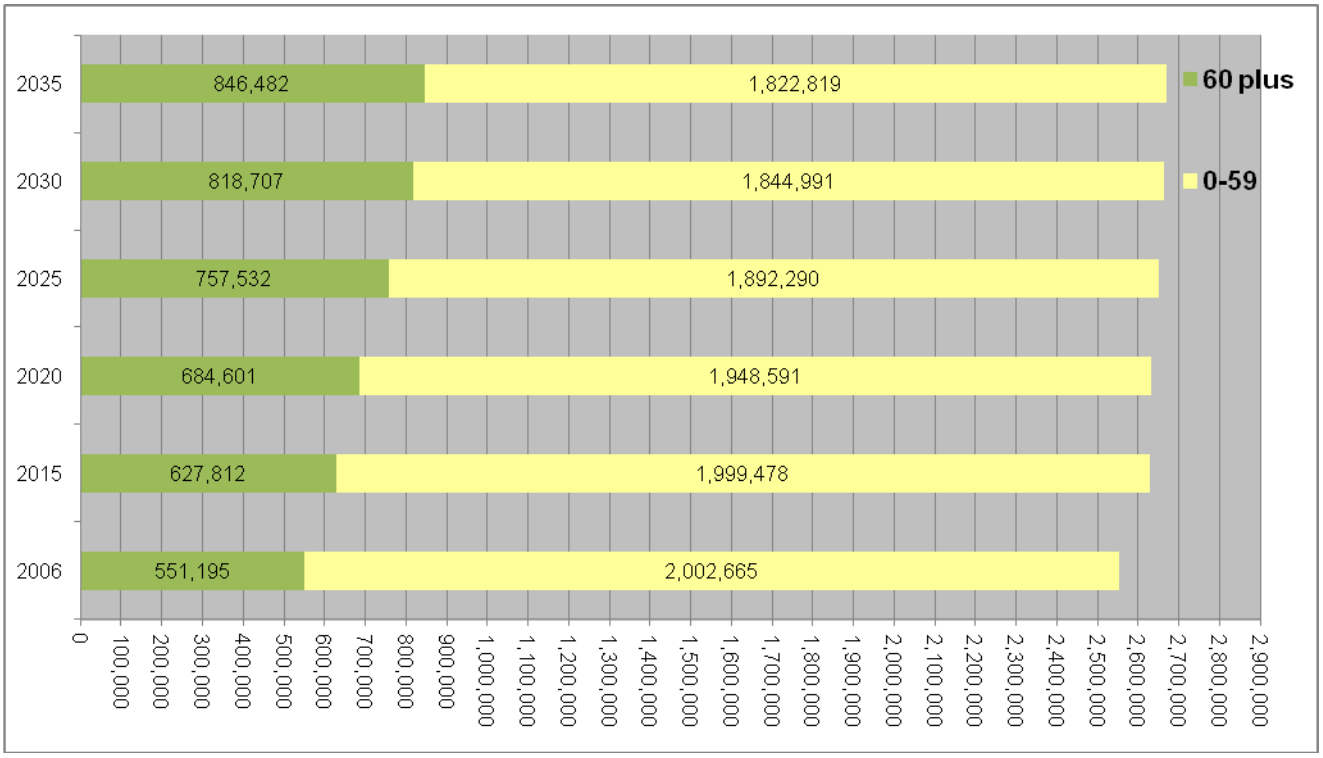
Forecast demographic change between 2015 and 2035

Overall between 2015 and 2035 the population in the West of Scotland is forecast to grow by 1.6%, a population increase of 42,011 (increasing from 2,627,290 in 2015 to 2,699,301 by 2035).

More significantly:

- **The number of people aged 60 plus is predicted to increase by 34.8%, an increase of 218,670 people aged over 60 by 2035**
- **The number of people aged 70 plus is predicted to increase by 56%, an increase of 183,959 people aged over 70 by 2035**

Figure 10: Actual and Forecast Demographic Changes in the West of Scotland Health Boards



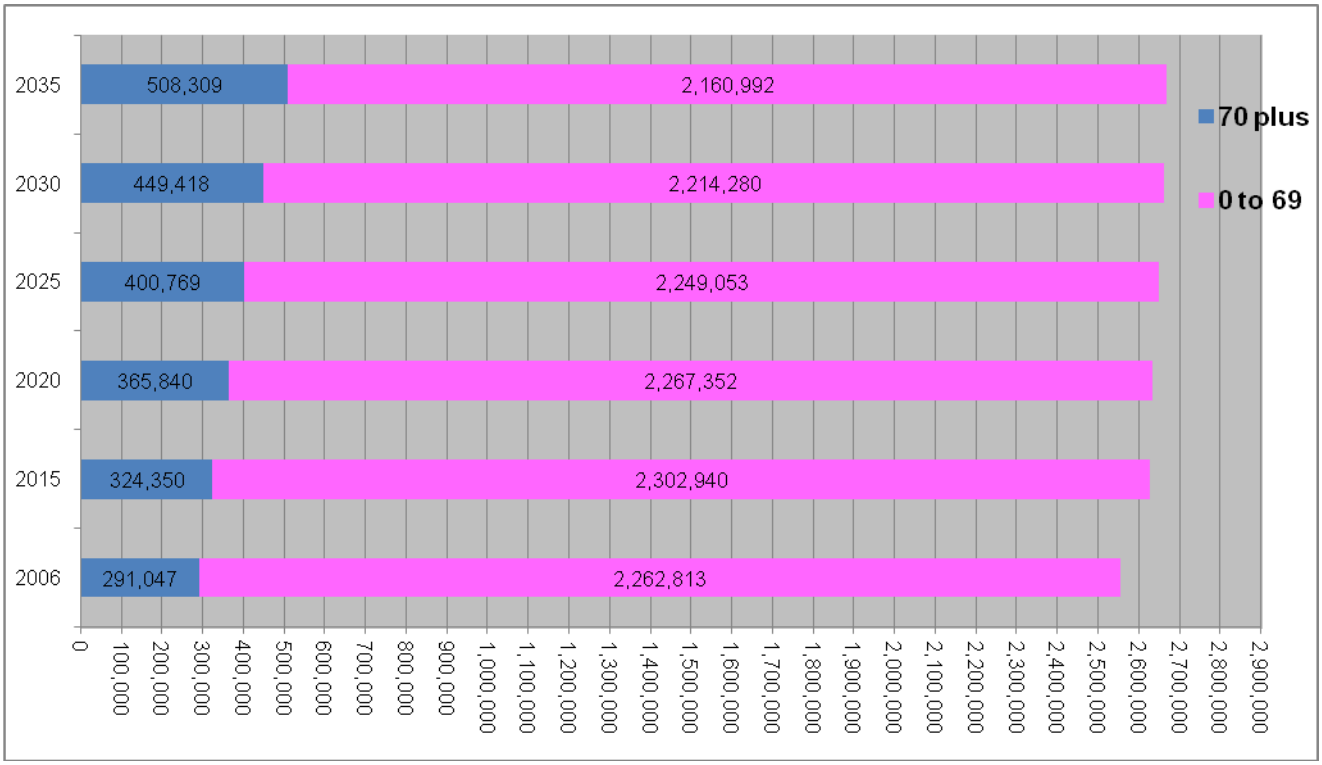
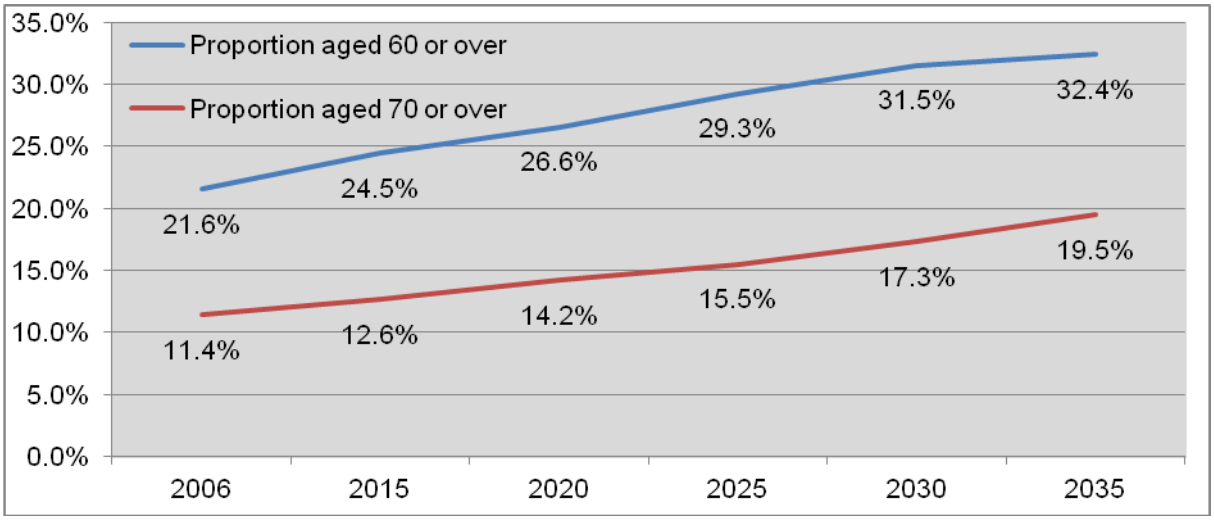


Figure 11 illustrates the actual and forecast increasing proportion of the population aged 60 plus and 70 plus between 2005 and 2035. The impact of such a large increase in people aged over 60 will have a significant impact in the demand for orthopaedics, general surgery ad endoscopy.

Figure 11: Actual and Forecast - Proportion of Population aged over 60 and 70 between 2005 and 2035



Life expectancy

Rising life expectancy is reflected in the population data used in the scenario modelling, however, it is important to note that life expectancy in the West of Scotland lags behind that of Scotland and the wider UK.

Changes over time

It was not possible to obtain life expectancy data of patients who are currently aged 50 to 70 living within the WoS however Appendix A6 charts life expectancy of those born 2015 in each WoS Health Board area, Scotland as a whole, the UK and other countries. There are some significant differences, males born within NHS Greater Glasgow and Clyde area are expected to live 4.1 years less when compared to the average life expectancy of men in the UK, similarly it is predicted that women living within NHS Greater Glasgow and Clyde areas will live 2.9 years less than the UK average. This is illustrated in figure 16.

Figure 12: Life Expectancy at Birth Analysis 2015 - (those born in 2015)

Country / WoS Health Board	Both Sexes Combined	Male	Female
United Kingdom	**81.2**	**79.4**	**83.0**
Scotland	**79.1**	**77.1**	**81.1**
Dumfries and Galloway	**79.7**	78.1	81.3
Forth Valley	**79.4**	77.7	81.1
Ayrshire and Arran	**78.5**	76.6	80.4
Lanarkshire	**78.2**	76.1	80.2
Greater Glasgow and Clyde	**77.7**	75.3	80.1

4.1.2 Current Waiting Times – WoS Health Boards

Waiting time pressures have increased significantly within the last 12 months, this is partly as a result of financial pressures as Health Boards have provided only core staffed sessions, and have been unable to resource additional outpatient and theatre sessions at much higher cost overtime / waiting list initiative rates.

Orthopaedics – Figure 13 illustrates that when compared to Jan 2017, March 2018 waiting time data indicates there are now over 12,500 patients waiting longer than 12 weeks to be seen within an

orthopaedic clinic. The increase within 12 months is almost a threefold increase in the total number of patients waiting.

Figure 14 shows a similar position for patients waiting > 12 weeks for a procedure – three years ago there were approx 500 patients waiting longer than 12 weeks to be treated, Jan 2018 data shows there are now well over 4,700 patients waiting longer than 12 weeks for their treatment.

Figure 13: Number of patients waiting over 12 weeks for an Orthopaedic new out patient appointment (Data Source: ISD)

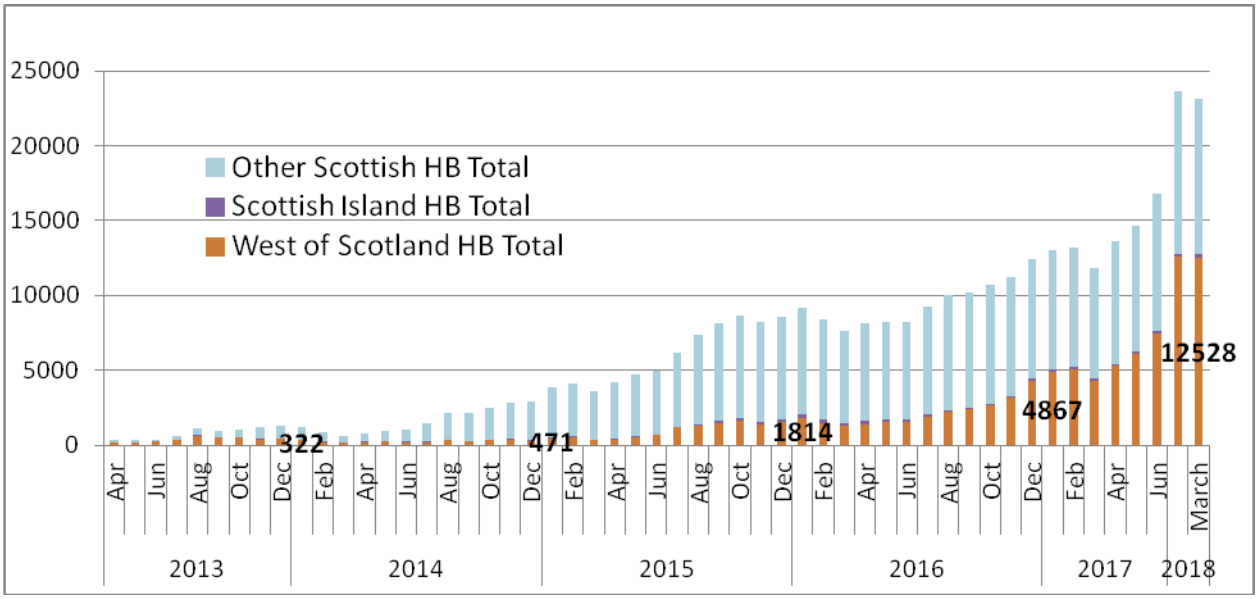
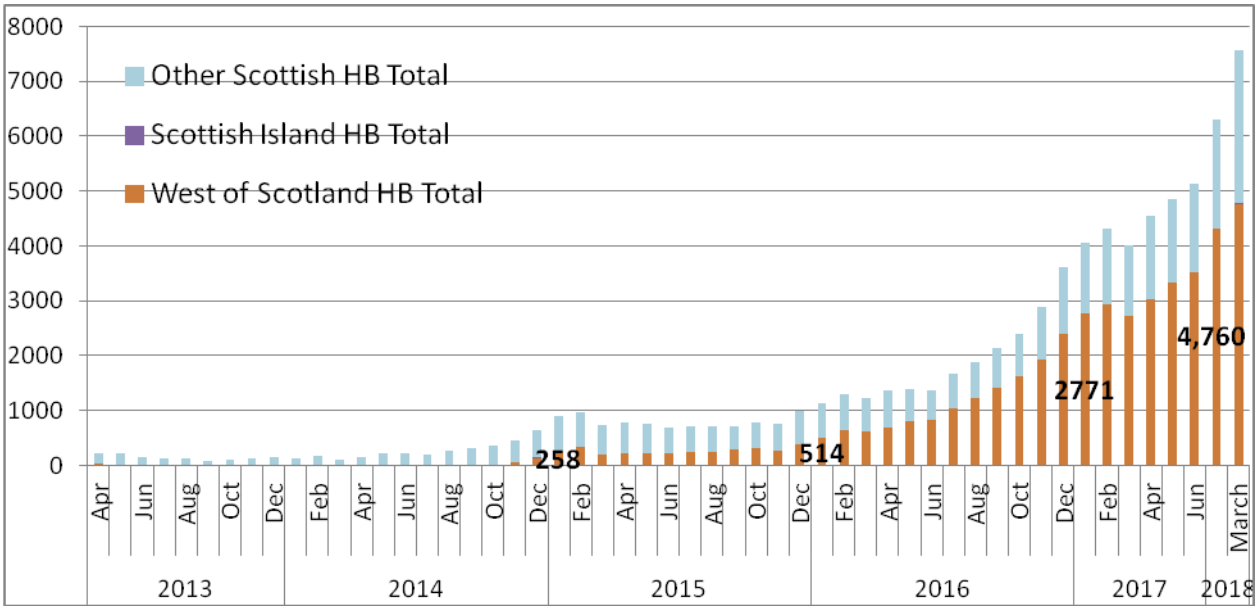


Figure 14: Number of patients waiting over 12 weeks for an Orthopaedic Procedure (Data Source: ISD)



General Surgery – Figure 15 illustrates that when compared to Jan 2017, March 2018 waiting time data indicates the number of patients waiting to be seen in a general surgery clinic has almost doubled within the last year - there are now over 3,400 patients waiting longer than 12 weeks to be seen within a general surgery clinic.

Figure 16 shows a similar position for patients waiting > 12 weeks for a procedure – three years ago there were less than 100 patients waiting longer than 12 weeks to be treated, March 2018 data shows there are now well over 1,100 patients waiting longer than 12 weeks for their treatment, an eleven fold increase.

Figure 15: Number of patients waiting over 12 weeks for a General Surgery new out patient appointment (Data Source: ISD)

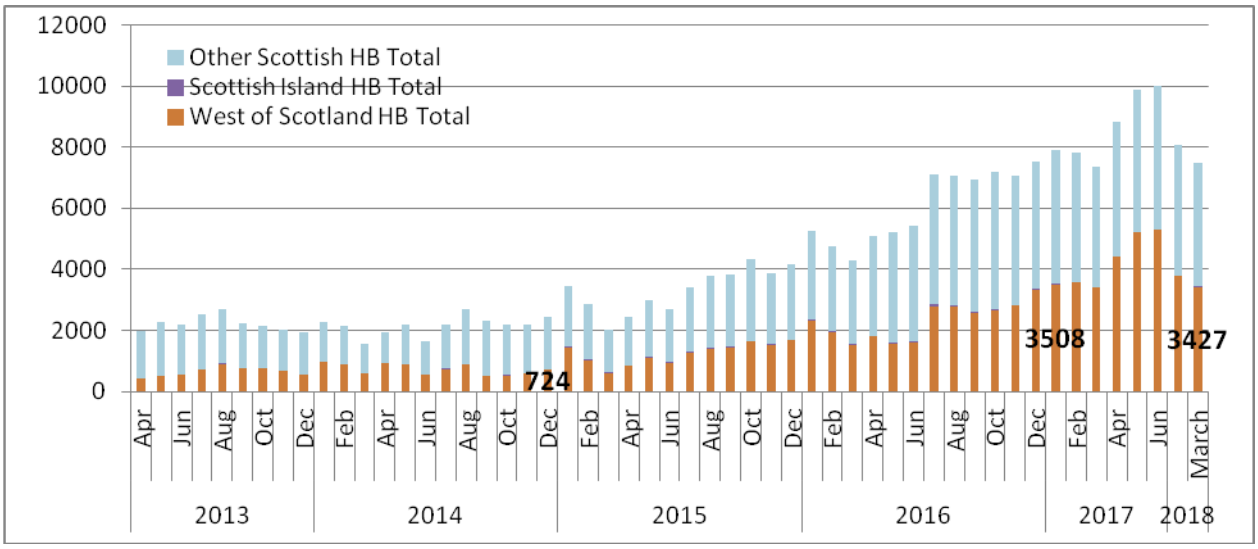
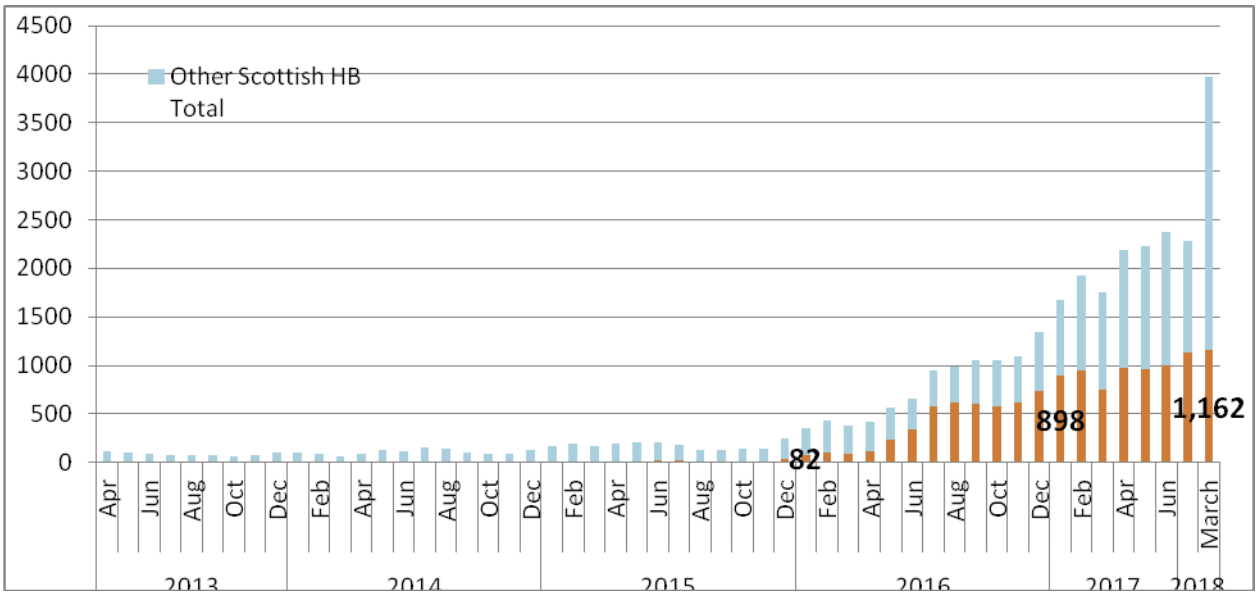


Figure 16: Number of patients waiting over 12 weeks for a General Surgery Procedure (Data Source: ISD)



Urology – Figure 17 illustrates that in Jan 2016 there were less than 100 patients waiting over 12 weeks, however the number of patients waiting more than 12 weeks to be seen in a new outpatient clinic have risen significantly over the last 2 years, with over 1,300 patients waiting in excess of 12 weeks in March 2018. The trend shows an improvement in recent months – this will be reviewed again at OBC stage.

Figure 18 shows three years ago there were only 59 patients waiting for a procedure – the numbers have since gradually increased to over 600 patients waiting longer than 12 weeks for their treatment in March 2018.

Figure 17: Number of patients waiting over 12 weeks for New outpatient Appointment Urology (Data Source: ISD)

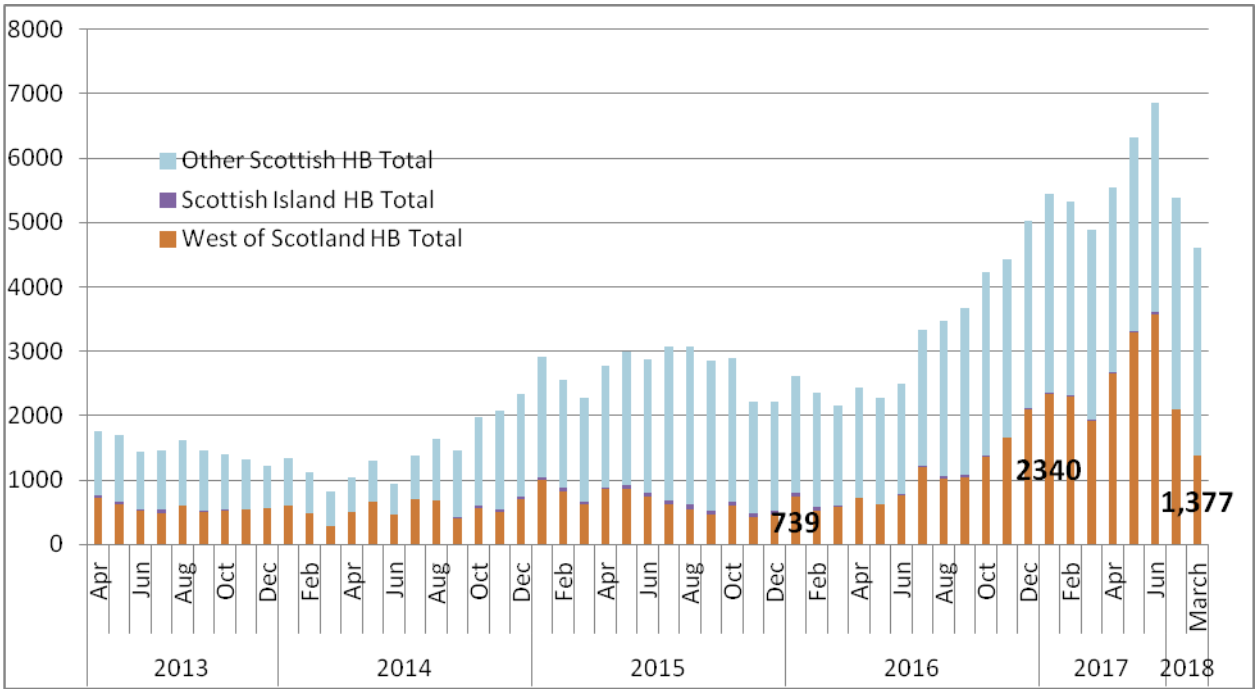


Figure 18: Number of patients waiting over 12 weeks for Urology Procedure (Data Source: ISD)

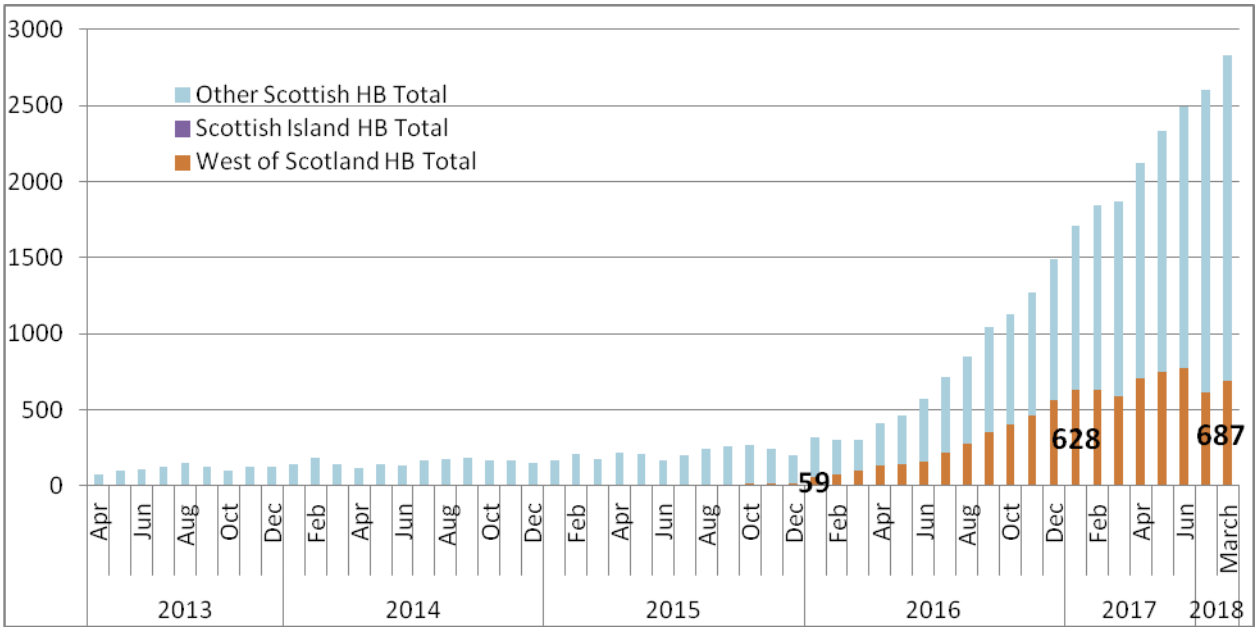


Figure 19 outlines the volume of patients waiting longer than 6 weeks for diagnostic endoscopy, in September 2017 there were over 10,000 patients waiting over 6 weeks for diagnostic endoscopy, a 75% increase when compared to 6 months previously in March 2017.

Within the West region there were almost 5,000 patients waiting more than 6 weeks for diagnostic endoscopy, of which 88% of patients resided within the NHS Greater Glasgow and Clyde Heath Board area.

Figure 19: Number of patients waiting over 6 weeks for Diagnostic Endoscopy Procedures (Data Source: ISD)

Geographical Area	Patients waiting over 6 weeks		
	March 2017	December 2017	% increase March to Dec
NHS Scotland	5,724	9,080	58%
West Region	2,988	4,679	56%
Proportion of West Region patients residing in NHS GGC Health Board Area	80%	80%	

4.1.3 Demand Modelling - Orthopaedic Surgery

Introduction

This section of the IA provides for each orthopaedic sub specialty an overview of:

- Current activity (2015 data) by procedure by Health Board of treatment
- Various demand modelling scenarios which project activity forecasts between now and 2035, these scenarios are based on:
- forecast population change only
- forecast population change plus various increased rates of intervention (based on previous years growth rates in intervention)
- A summary by sub speciality of the required additional activity by 2035, assuming a minimum clinical productivity improvement within WoS hospitals of 10%.

Methodology

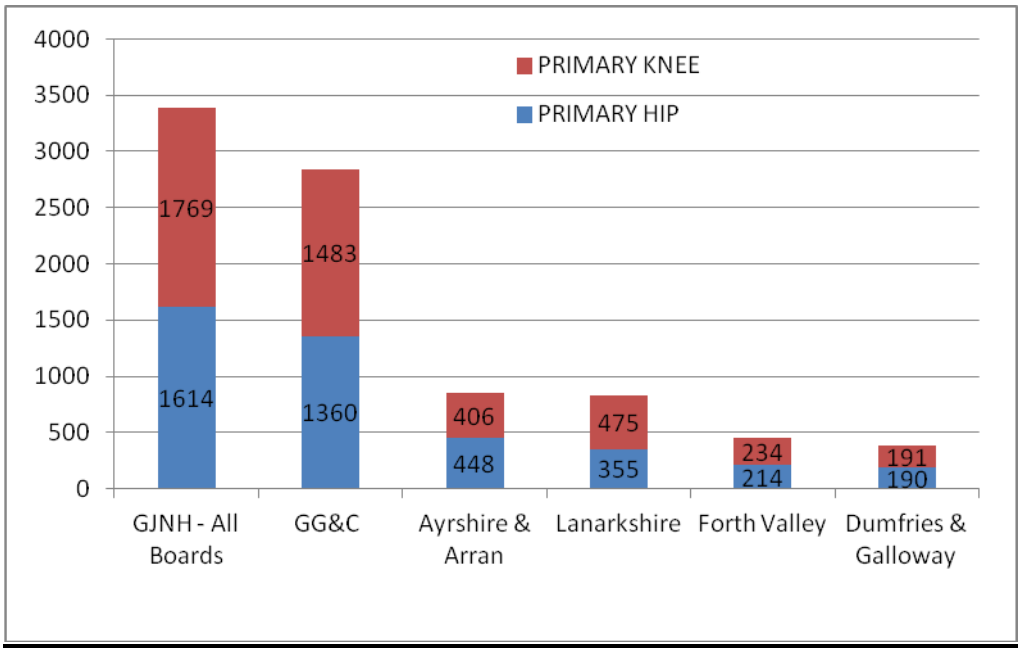
- Activity includes elective only procedures performed as either day case or inpatient procedures. (all emergency admissions / procedures/ inter hospital transfers have been excluded).
- Data was further reviewed to exclude any diagnostic testing – e.g. blood testing, imaging, spinal anaesthesia, etc
- Procedures performed on patients under the age of 16 were excluded
- Age at time of intervention by proportion of patients was provided by ISD and or GJF (where the procedure is currently performed in high volume at the GJF)

- All remaining activity was classified/categorised using OPCS 4 codes – using the primary procedure code and the paired code to identify the anatomical site) (see appendix 13).

Primary Arthroplasty - Current Activity – 2015 (Source ISD SAP data)

Figure 20 summarises the primary arthroplasty undertaken by each Health Board in 2015.

Figure 20: 2015 Primary Arthroplasty Activity by Board of Treatment



Comparison of GJF Demand Modelling and Demand Modelling

GJF have undertaken detailed demand modelling exercises for the full range of orthopaedic sub specialties. In parallel ISD have also developed population growth only modelling exercise to predict the impact of population growth alone on the demand for primary hip and primary knee replacement.

There are a number of differences between the ISD demand modelling and the GJF demand modelling exercises.

The difference in the methodologies are as follows:

- Baseline year– ISD model assumes a three year average (2014, 2015, 2016) as the baseline year – whereas GJF have assumed the calendar year of 2015, as the baseline year.
- Given that primary Hip and Primary knee replacement activity has risen year on year this means the baseline for ISD modelling is significantly lower than the GJF modelling.
- ISD modelling includes population growth +/- a 5% tolerance, it does not model the full potential impact of both population growth and a further rises in intervention rates – something which has been experienced every year within NHS Scotland the UK and worldwide. There are many

papers published that predict significant increases in intervention rates between now and 2030/ 35 as outlined in section 4.1.4.

It is important to note that within the GJF demand modelling it is assumed that each WoS Health Board can deliver 10% clinical productivity improvement (based on their 2015 activity levels). In addition no allowance has been made to support the current waiting time backlog of patients who are being treated out with the TTG timescales, it is assumed that Health Boards will recover this position independently.

4.1.4 Is population growth alone sufficient to predict future demand for Primary Arthroplasty?

In considering the most appropriate approach to forecasting demand it is important to understand how much population growth alone has influenced demand for arthroplasty in the last 10 - 11 years. In completing the demand modelling analysis, three factors have led the GJF to predict that demand for primary arthroplasty will exceed population growth alone:

A) Population Growth 2005 and 2016 did not correlate with the increased demand for arthroplasty experienced

A review of how much demographic change might have influenced the last 10 – 11 years growth in THR and TKR activity has also been undertaken and has identified the following:

In the ten year period between 2005 and 2015 the population aged over 60 grew by almost 15%, yet:

- the number of TKR performed rose by 56%, and the rate of intervention in the WoS rose from approx 105 procedures to approx 155 procedures per 100,000 population
- the number of THR performed rose by 41.9% and the rate of intervention in the WoS rose from approx 100 procedures to approx145 procedures per 100,000 population

Looking back at actual activity, population growth alone was therefore not an accurate measure for predicting demand for arthroplasty in the last 10 - 11 years.

B) NHS Scotland and WoS current rates of intervention are significantly below other peer countries

NHS Scotland and WoS Intervention rates for primary hip and primary knee arthroplasty are behind that of similar OECD countries – proving rates of intervention per 100,000 population are likely to continue to rise (see Figure 22 and Figure 23).

C) Forecast Rates of Intervention for Arthroplasty will continue to rise at a rate ahead of population growth

A literature review identified many international and national studies to predict the future projections for Hip and Knee arthroplasty, all of which conclude that the rates of intervention will continue to rise ahead of the rate of population change. A large detailed study entitled "***Future projections of total hip and knee arthroplasty in the UK: results from the UK Clinical Practice Research Datalink" published in the osteoarthristis and Cartilidge Journal Vol 23 (2015)*** estimated the future rate of primary total hip or knee replacement in the UK to 2035 allowing for changes in population demographics and obesity. A summary of the studies predictions is set out within Figure 21.

Figure 21: Projected UK Counts for THR and TKR in adults to the year 2035

Year	Estimated THR Incidence rates fixed at 2010 level		Estimated TKR incidence rates increasing log linearly	
	BMI category proportions fixed at 2010 estimates	BMI category proportions changing over time	BMI category proportions fixed at 2010 estimates	BMI category proportions changing over time
2015	72,762	72,418	82,610	85,019
2020	79,716	79,048	90,555	94,783
2025	85,988	85,026	97,780	103,657
2030	91,496	90,202	103,810	111,015
2035	97,516	95,877	110,306	118,666
Percentage increase 2015 to 2035	**34.0%**	**32.4%**	**33.5%**	**39.6%**

Source: "Future projections of total hip and knee arthroplasty in the UK: results from the UK Clinical Practice Research Datalink" published in the osteoarthristis and Cartilidge Journal Vol 23 (2015)

It is important to note that the study used available data from England to estimate the BMI distribution for the UK. Although England accounts for 85% of the UK population, the estimated BMI distribution is likely to be a little different to that of the UK. Comparisons between countries show Scotland does have a slightly higher obesity prevalence than England, but for Wales and Northern Ireland the prevalence is lower than England.

In summary, the period from 2015 to 2035 population forecasts predict there will be almost a 35% increase in the number of people aged over 60, when compared to the previous ten years. The GJF demand

modelling forecasts a further 53% increase in TKR and 42% increase in THR activity over the next 18 years, providing capacity for 2,967 primary joints. This seems more realistic than population growth alone which forecasts a 21.5% increase in THR activity and 24.5% increase in TKR activity providing capacity for only 1,606 primary joints between 2017 and 2035.

It is important to note the following:
No allowance has been made for the current waiting times backlog within the West of Scotland region. Figures 13 and 14 indicate that there were 12,591 patients waiting over 12 weeks to be seen within a new orthopaedic outpatient clinic and 4,312 patients waiting longer than 12 weeks for their orthopaedic procedure as at 6th Jan 2018. This is not an insignificant number, and it will take some time for Health Boards to reach a position of balance with waiting times within orthopaedic surgery.

In developing our options it has been assumed that West Of Scotland Boards currently delivering orthopaedic services will also deliver a 10 % productivity improvement within orthopaedics – primarily by improving length of stay and improving theatre utilisation.

Figure 22: Comparison of ISD and GJF demand Modelling for TKR

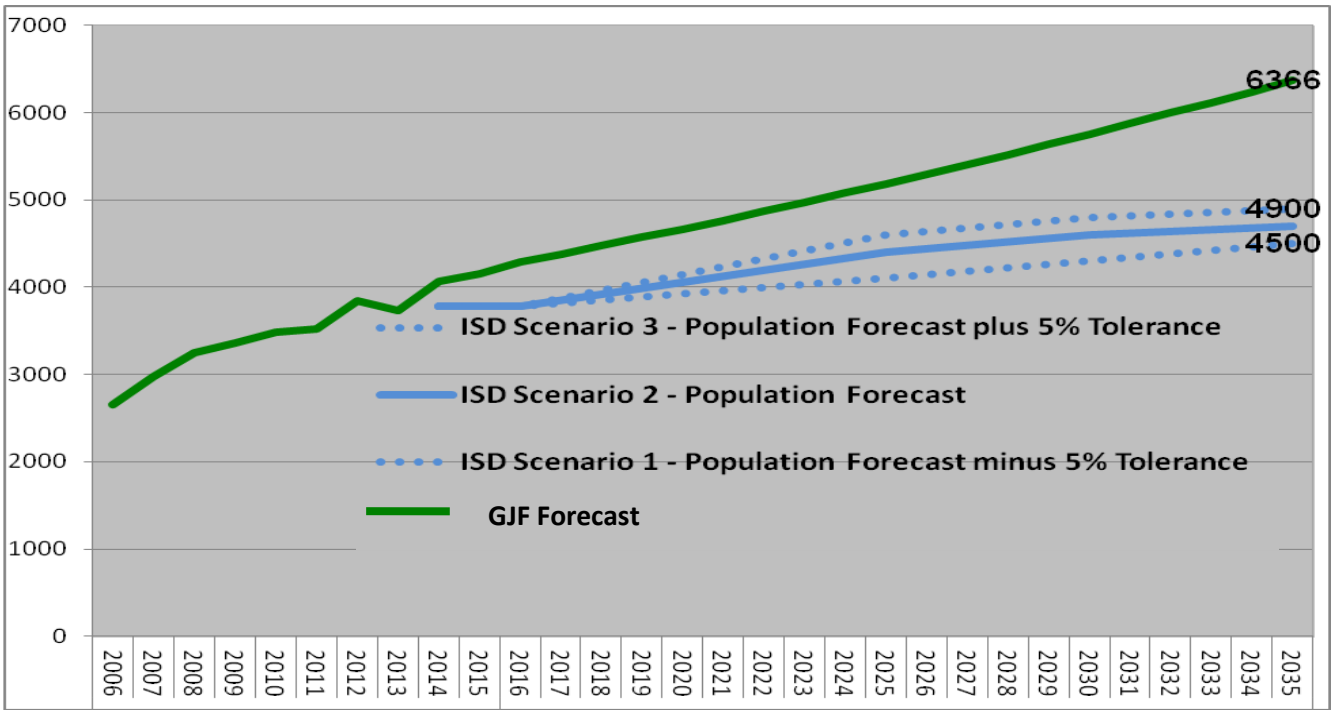
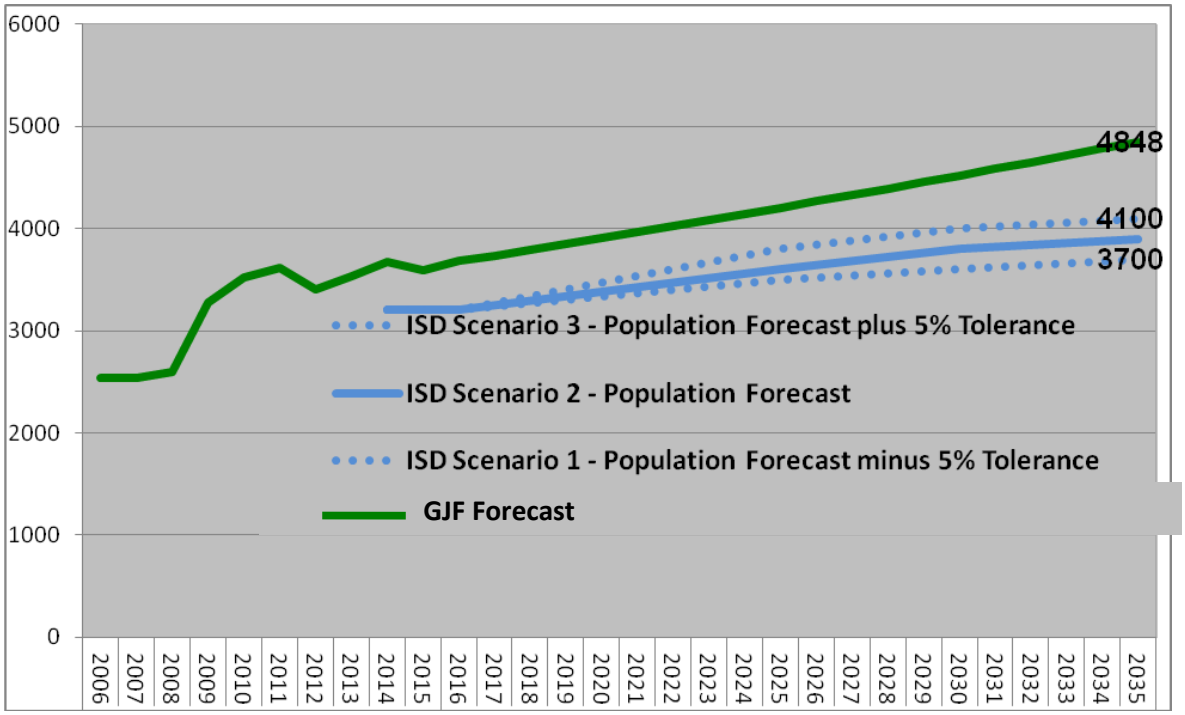


Figure 23: Comparison of ISD and GJF demand Modelling for THR



Primary Knee Arthroplasty - Rising rates of Intervention

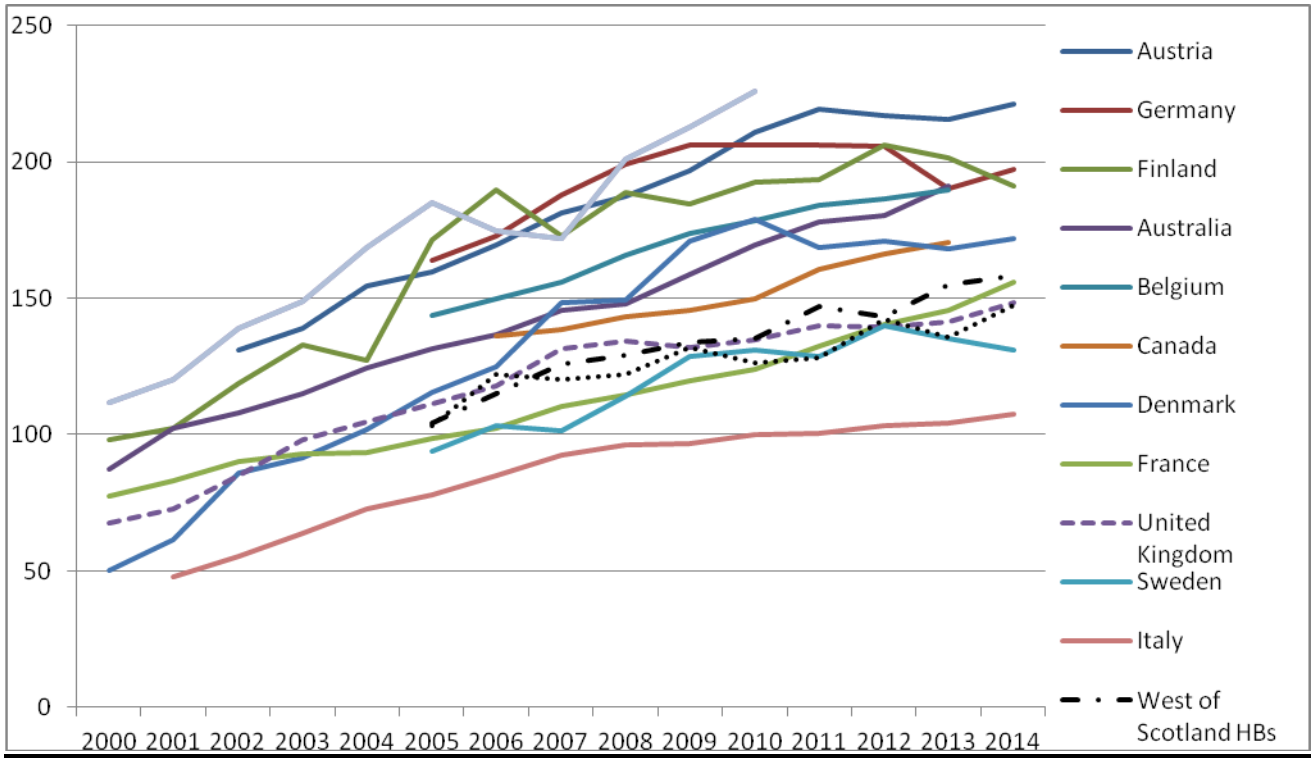
The rate of intervention for Primary Knee replacement surgery has risen significantly in the UK over the last ten years from 104 (2004) to 148 (2014) per 100,000 population, a 42% increase in the intervention rate, which is not explained by demographic changes alone. (Source OECD Statistics).

Over the last 10 years the West of Scotland intervention rate has risen from 104 (2004) to 158 (2014) per 100,000 population, a 51.9% increase in the intervention rate, which cannot be explained by demographic changes alone (Source OECD Statistics).

Figure 24 provides a summary of TKR intervention rates by country from 1997 to 2014. Noticeably the rate of intervention is rising in every country. When compared with other similar countries, the rate of intervention within the UK, Scotland and the West of Scotland region is significantly lower than similar peer countries. Interestingly the rate of TKR is slightly higher in the West of Scotland in recent years when compared with the UK rates – this may be due in part to lifestyle and the impact of higher levels of obesity within the West of Scotland.

Overall the chart below illustrates there is not over provision of TKR procedures at present within the WoS or Scotland.

Figure 24: TKR - OECD Countries Crude rate of Intervention per 100,000 population



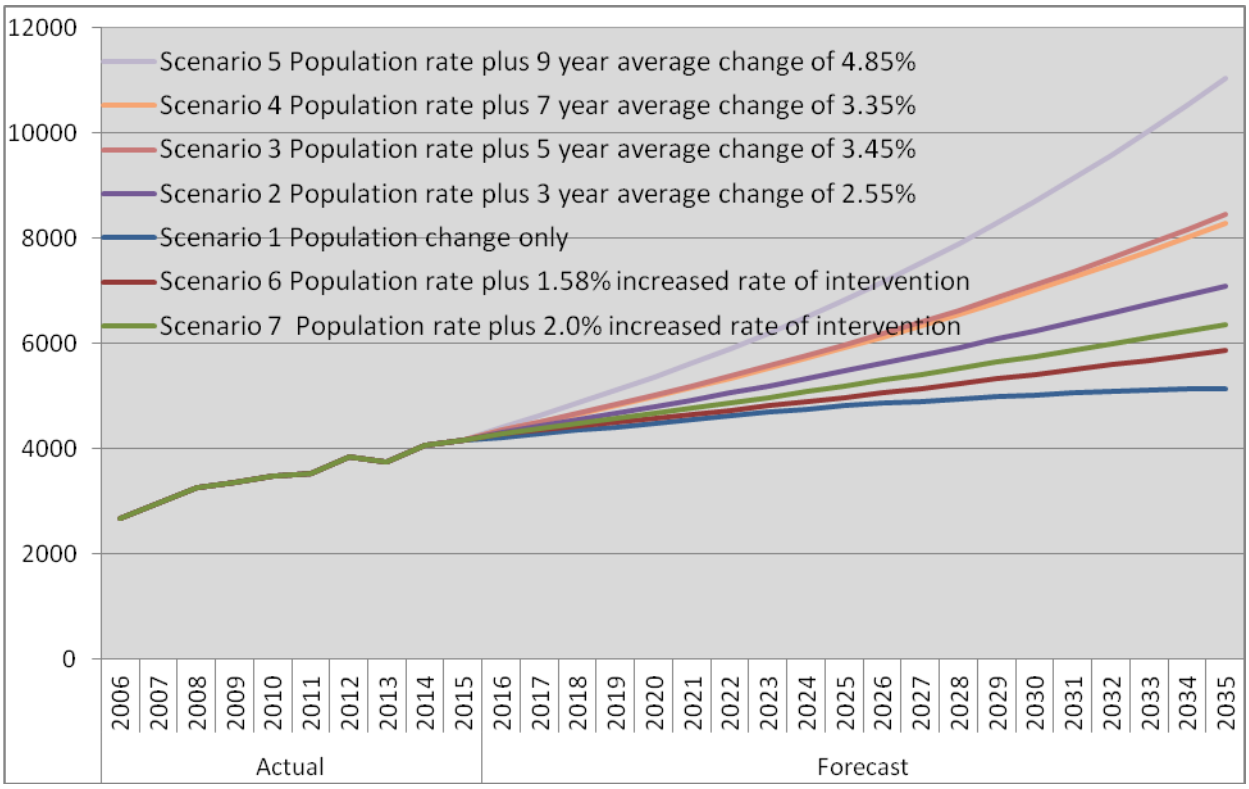
Primary Total Knee Replacement (TKR) - GJH Modelling

Building on the ISD work, more detailed scenario modelling has been undertaken covering seven potential scenarios of population change only, and the 3,5,7 and 10 year growth rates as well as a growth rate of 1.37% and 2.0%

In addition within each scenario the age at time of intervention has been taken into account and the forecast demand has been modelled to 2035 in recognition that any additional capacity will not be available before the end of 2021.

Detailed modelling has been completed for Primary Total Knee Replacement using population forecast data and TKR procedures by age band at the Golden Jubilee Hospital in the calendar year of 2015. Figure 25 provides an overview of the various scenarios modelled – ranging from population growth only to the 9 year average rate of growth – 4.85% per annum.

Figure 25: Demand Modelling Scenarios - TKR



The initial draft outputs from the model are outlined below and indicate the number of additional procedures required and the potential estimated theatre requirements.

Figure 26: Outputs from the Modelled Demand Scenarios for TKR

Year	Scenario						
	Scenario 1 Population change only	Scenario 2 Population rate plus 3 year average change of 2.55%	Scenario 4 Population rate plus 7 year average change of 3.35%	Scenario 4 Population rate plus 7 year average change of 3.35%	Scenario 5 Population rate plus 9 year average change of 4.85%	Scenario 6 Population rate plus 1.58% increased rate of intervention	Scenario 7 Population rate plus 2.0% increased rate of intervention
2020	324	638	852	828	1200	415	511
Additional Theatres	0.4	0.7	1.0	1.0	1.4	0.5	0.6
2025	654	1315	1815	1757	2674	819	1029
Additional Theatres	0.8	1.5	2.1	2.0	3.1	1.0	1.2
2030	863	2082	2955	2853	4544	1253	1598
Additional Theatres	1.0	2.4	3.4	3.3	5.3	1.5	1.9
2035	979	2933	4287	4125	6891	1706	2211
Additional Theatres	1.1	3.4	5.0	4.8	8.0	2.0	2.6

Note: the 'Additional Theatre' requirements above have been identified using the performance assumptions set out in Appendix A11

Looking at the retrospective activity trend analysis whilst Scenario 6 models forecasts population change and a 1.58% increase year on year in line with the 39.6% predicted increase within the osteoarthristis and Cartilage Journal study (Vol 23 2015), it is known that Scotland has a higher rate of obesity which directly correlates with demand for TKR.

In the last 10 years the WOS has seen a 51.9% increase in the number of TKR procedures undertaken, in 2013 in Scotland 27.1% of adults were obese with a BMI of 30 or above, whilst 64.6% had a BMI of 25 or more.

Therefore scenario 7 (forecast population change plus a 2.0% increase in rate of intervention year on year) appears to be the most likely between now and 2025.

In summary the literature review and the modelling exercise has identified the need for additional capacity for 2211 additional TKR procedures by 2035.

Assuming there is a 10% productivity improvement (based on 2015 baseline of 4,150 primary hip procedures) within the other WoS hospitals and an additional 415 TKR procedures are delivered using existing resources, there will be a need for the GJF to expand and deliver a further 1,796 procedures by 2035. Under this forecast there is a requirement for 2.1 additional theatres.

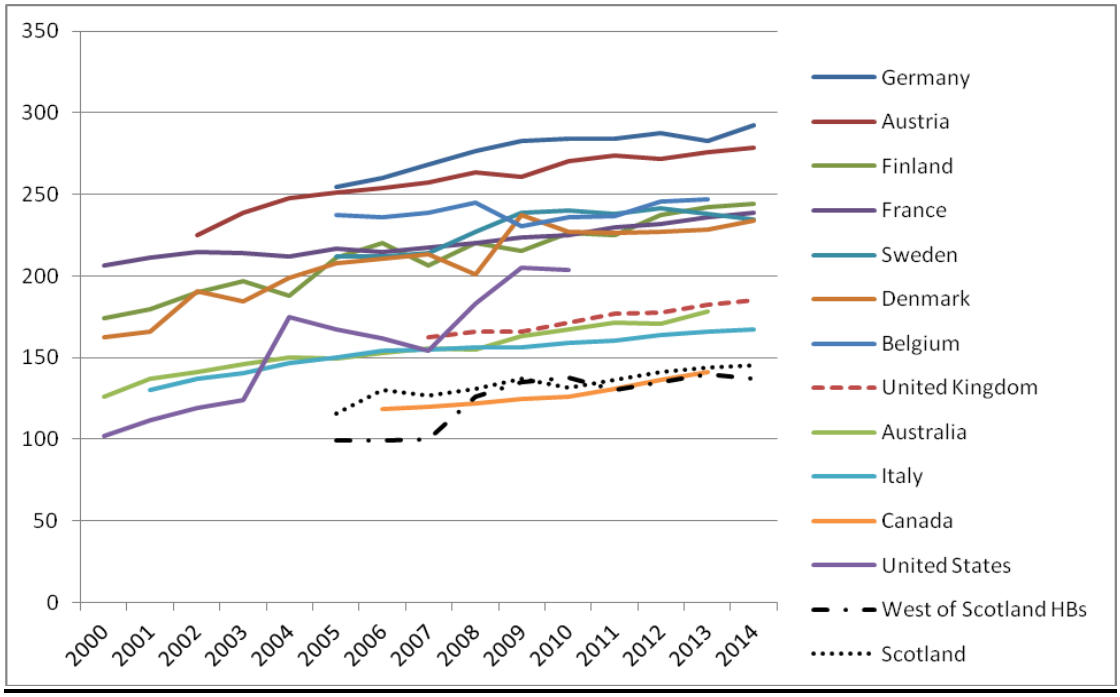
Primary HIP Arthroplasty - Rising Rates of Intervention

The rate of intervention for Primary Hip replacement surgery has risen significantly in the UK over the last seven years from 162 (2007) to 185 (2014) per 100,000 population, a 14% increase in the intervention rate, which is not explained by demographic changes alone. (Source OECD Statistics).
Over the last 7 years the West of Scotland intervention rate has risen from 100 (2007) to 137 (2014) per 100,000 population, a 37% increase in the intervention rate, which cannot be explained by demographic changes alone (Source OECD Statistics).

The graph below provides a summary of THR intervention rates by country from 1997 to 2014. Noticeably the rate of intervention is rising in every country. When compared with other similar countries, the rate of intervention within the UK, Scotland and the WoS regional intervention rates are significantly lower than the UK and other similar peer countries.

Overall Figure 27 below illustrates there is not over provision of THR procedures at present within the WoS or Scotland.

Figure 27: THR - OECD Countries Crude rate of Intervention per 100,000 population

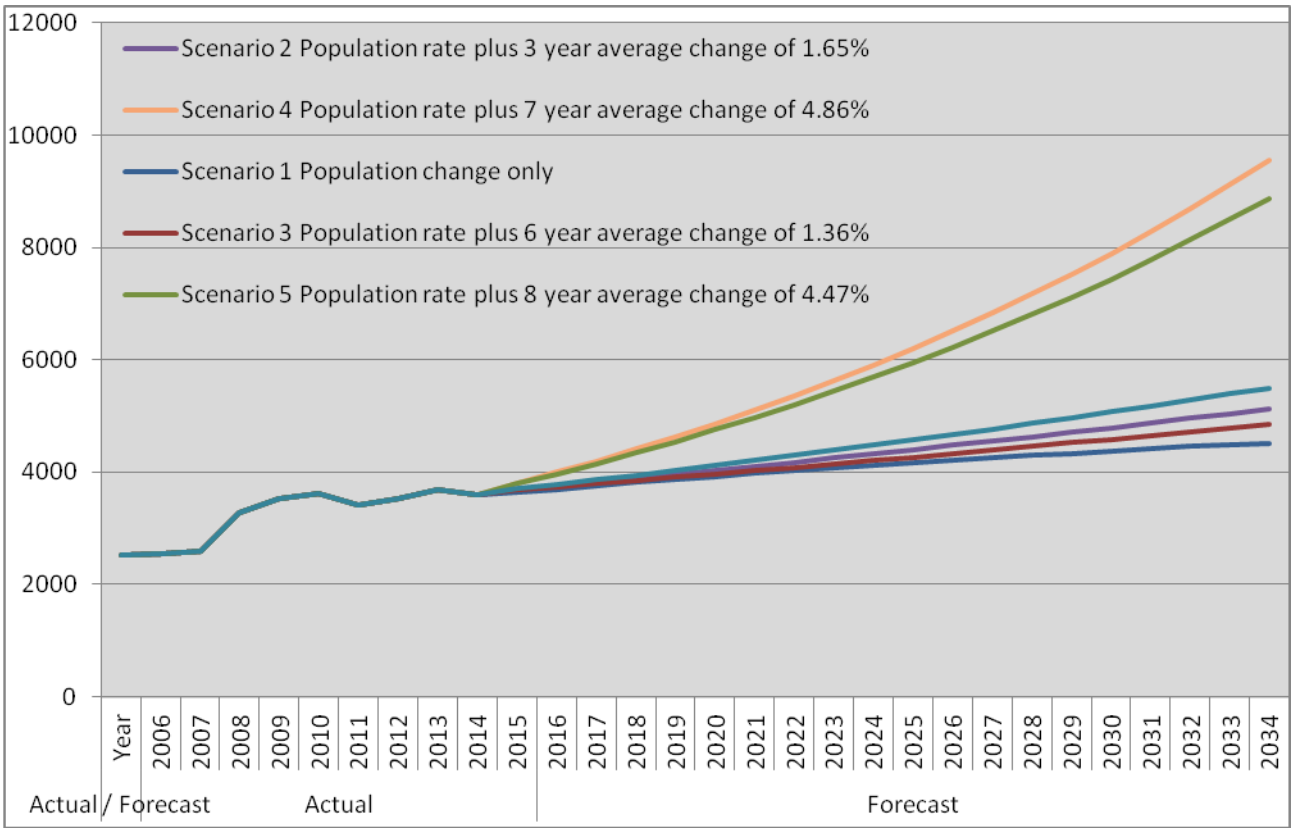


Primary Total Hip Replacement (THR) GJH Modelling

Detailed modelling has been completed for primary Total Hip Replacement using population forecast data and TKR procedures by age band at the Golden Jubilee Hospital in the calendar year of 2015. The graph

below provides an overview of the various scenarios modelled – ranging from population growth only to the 7 year average rate of growth – 4.86% per annum.

Figure 28: Demand Modelling Scenarios - THR



The initial draft outputs from the model are outlined below and indicate the number of additional procedures required and the potential estimated theatre requirements. These will be reviewed further as the modelling is developed and the target operating model is further refined.

Figure 29: Outputs from the Modelled Demand Scenarios for THR

Year/ Additional theatres	Scenario					
	Scenario 1 Population change only	Scenario 2 Population rate plus 3 year average change of 1.65%	Scenario 3 Population rate plus 6 year average change of 1.36%	Scenario 4 Population rate plus 7 year average change of 4.86%	Scenario 5 Population rate plus 8 year average change of 4.47%	Scenario 6 - Population Rate plus 2.0% increased rate of intervention
2020	275	367	312	1035	949	437
Additional Theatres	0.3	0.4	0.4	1.2	1.1	0.5
2025	538	729	612	2311	2095	885
Additional Theatres	0.6	0.8	0.7	2.7	2.4	1.0
2030	742	1120	929	3931	3522	1377
Additional Theatres	0.9	1.3	1.1	4.6	4.1	1.6
2035	916	1530	1255	5966	5280	1905
Additional Theatres	1.1	1.8	1.5	6.9	6.1	2.2

Note: the 'Additional Theatre' requirements above have been identified using the performance assumptions set out in Appendix A11

Looking at the retrospective activity trend analysis Scenario 3 models forecasts population change and a 1.36% increase year on year in line with the 32.4% predicted increase within the osteoarthritis and Cartilage Journal study (Vol 23 2015). However looking at the WoS rate of intervention for Hip replacement, it is behind both Scotland and the UK rates, therefore scenario 2 (forecast population change plus a 1.65% increase in rate of intervention year on year) appears to be the most likely between now and 2025.

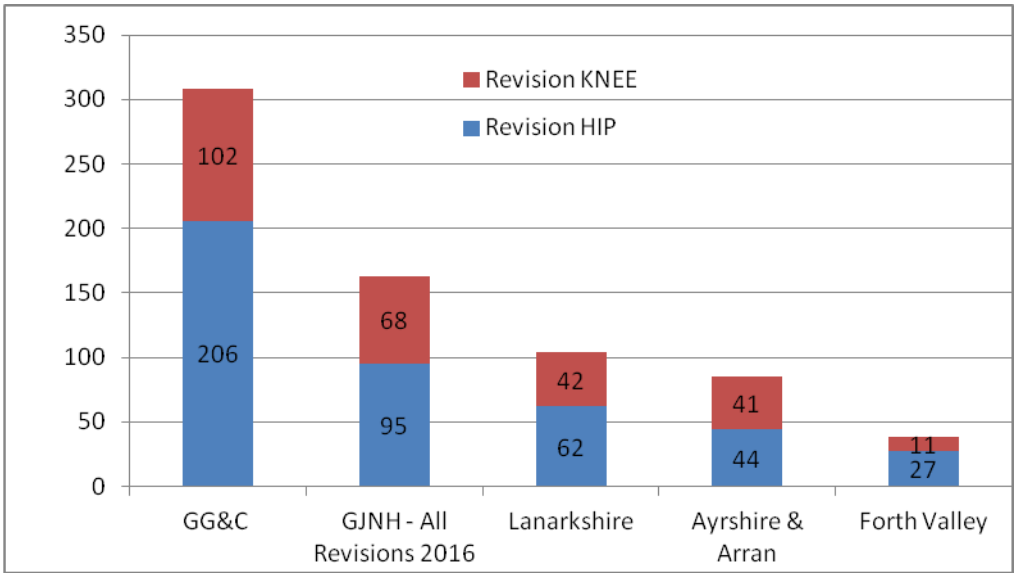
In summary the literature review and the modelling exercise has identified the need for additional capacity for between 1530 additional THR procedures by 2035.

Assuming there is a 10% productivity improvement (based on 2015 baseline of 3,590 primary hip procedures) within the other WoS hospitals and an additional 359 THR procedures are delivered using existing resources, there will be a need for the GJF to expand and deliver a further 1,171 THR procedures by 2035. There will therefore be a requirement for 1.4 additional theatres.

Revision Arthroplasty Demand Modelling

Figure 30 illustrates the current revision arthroplasty activity undertaken in each Health Board and at the GJF, it is important to note the GJF figure includes all revision procedures undertaken not just WOS patients.

Figure 30: Current Revision Activity by Health Board 2015 / 2016 activity



The GJF have seen their revision arthroplasty numbers rise significantly over the last 8 years, this is as a direct result of continued service expansion. Since 2010/11 the GJH orthopaedic team have undertaken all revision arthroplasty surgery for NHS Dumfries and Galloway, in addition since 2015 the team also now provide NHS Shetland's lower limb arthroplasty service and as a result receive all referrals for revision surgery.

In order to ensure the full future arthroplasty demand is considered the predicted number of revision arthoplasty procedures has also been modelled between now and 2035. Detailed modelling has been undertaken looking at 1,3,5,7 and 0 year revision rates (assuming the all WoS Board lower revision rates to GJF levels) . The modelling takes into account current GJF activity (and the impact of orthopaedic expansion over the last 12 years) and the proposed expanded numbers of Primary Hip and Primary Knee Arthroplasty between now and 2035.

Prior to the planning for the elective centres the GJF had begun modelling the forecast demand for revision arthroplasty - for those patients who have previously undergone primary joint replacement at the GJH. The output of this modelling is shown in Figure 31.

Figure 31: GJH Actual and Predicted Revision Arthroplasty Procedures from 2007 to 2035

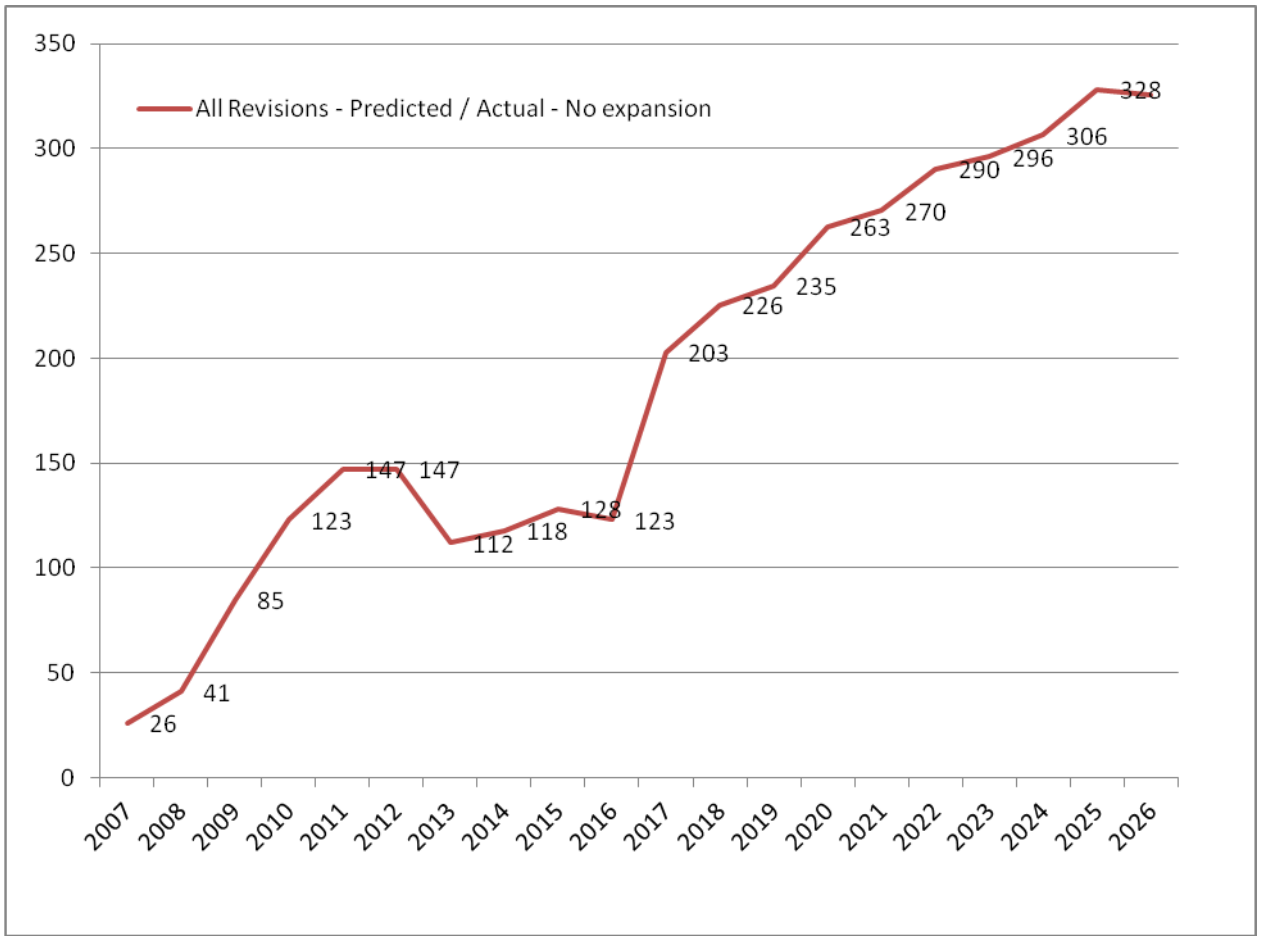
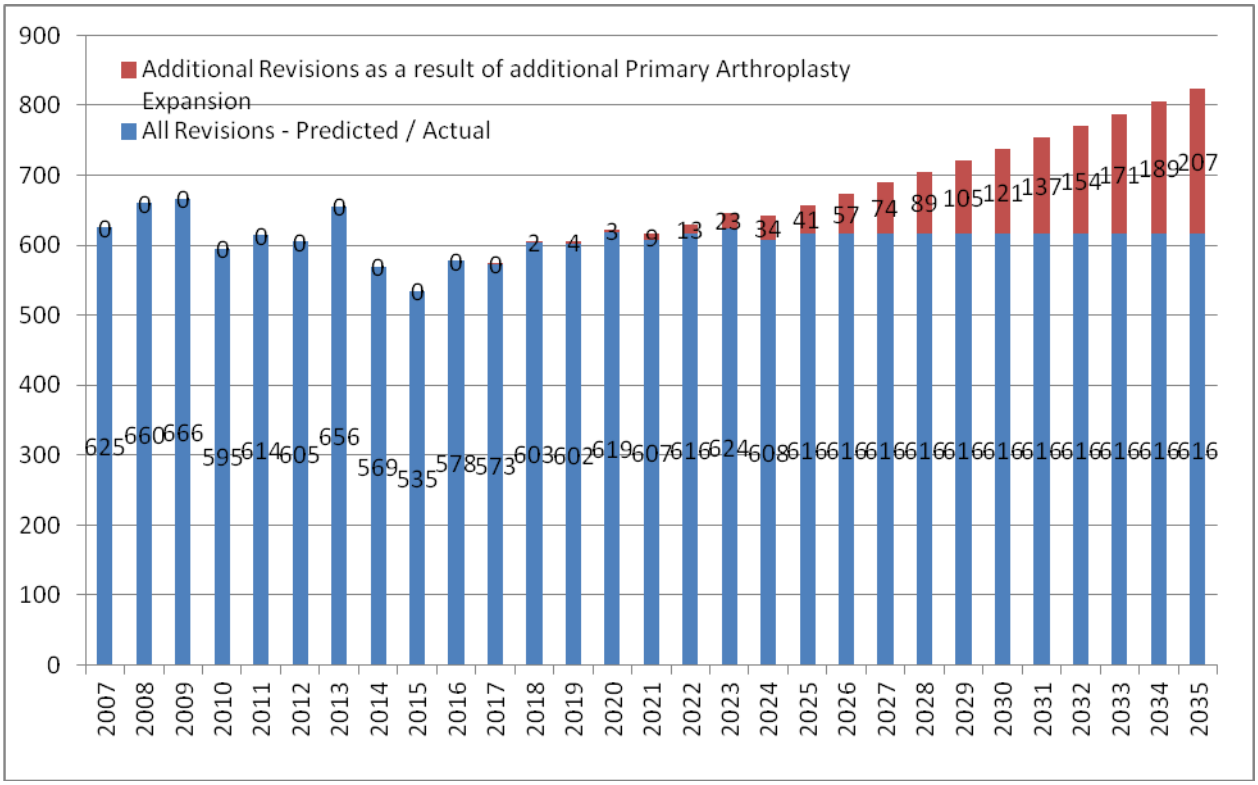


Figure 31 illustrates that even with no further expansion of the primary arthroplasty service there will be a need to plan for the additional future revision arthroplasty requirements as a result of the rapid expansion of primary arthroplasty at GJF.

Further modelling has been undertaken for the West of Scotland to assess the likely increase in revision arthroplasty as a result of the expansion of elective capacity. Figure 32 below provides an overview of the revision arthroplasty procedures undertaken by WoS Health Boards (NB this excludes procedures carried out by the GJF on WOS residents). Figure 32 highlights the additional revision arthroplasty activity between 2018 and 2035, by 2035 there is a predicted need for 207 additional revision procedures for the WoS population (based on expansion of 1530 additional primary hip replacement procedures and 2,211 additional primary knee replacement procedures by 2035).

Figure 32: Predicted additional West of Scotland revision arthroplasty procedures as a result of expansion of the primary arthroplasty service between now and 2035.



In summary the modelling exercise has identified the need for additional capacity for between 405 additional revision procedures (207 as a result of additional WoS expansion in primary arthroplasty between now and 2035 plus an additional 198 procedures required as a result of the expansion of the GJF primary arthroplasty service over the last 10 years).

Assuming no productivity improvement within the other WoS hospitals to deliver the additional Revision arthroplasty procedures there will be a requirement for 1.0 additional theatre.

Foot and Ankle Procedures

Detailed modelling has been completed for all foot and ankle procedures using population forecast data and F&A procedures by age band at the GJH in the calendar year of 2016 (see figure 12). As expected 59% of Foot and ankle procedures are carried out between the age of 16 to and 59, as a result we would not expect the demand for foot and ankle surgery to rise as fast as the demand for TKR or THR.

Figure 33: Foot and Ankle Procedures - age at time of intervention

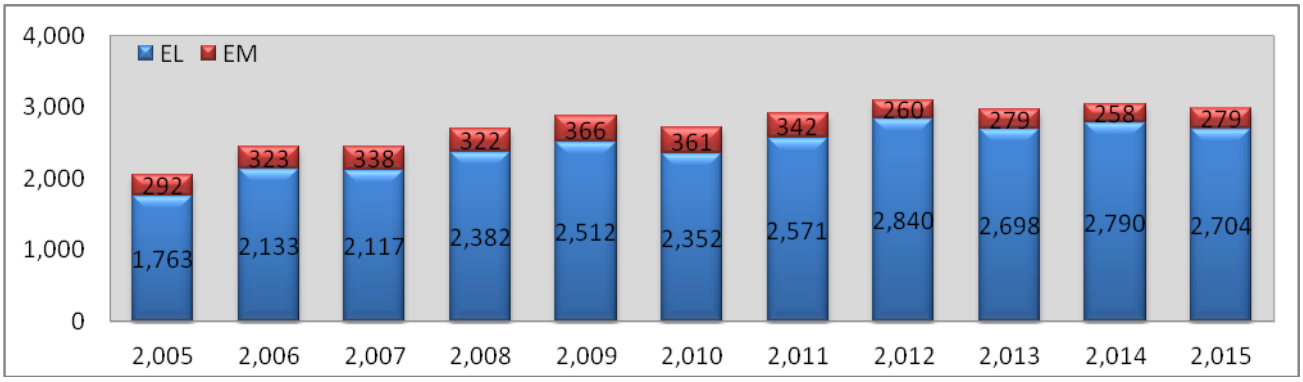
16 to 19	20-29	30-39	40-49	50-59	60-69	70-79	80 - 89	90 plus
1%	8%	9%	18%	23%	24%	15%	2%	0%

Between 2006 and 2015, the volume of F&A procedures rose from 2,309 to 3,000 procedures per annum a 29.9% increase in activity over a 10 year period. Over the last 10 years the primary activity trend has been upwards whereas the secondary trend has varied year to year – as shown in figure 13.

Figure 13 illustrates the increase in the rate of intervention per 100,000 population. In 2006 there were 93 procedures carried out per 100,000 population, by 2015 this figure had risen to 114 procedures per 100,000 population. In summary the rate of increase in intervention has not been solely driven by changes in demography, there has been a shift towards higher rates of F&A intervention.

A review of the elective emergency activity split over the last 10 years in foot and ankle surgery has identified a fairly small decrease in emergency activity between 2010 and 2011, which does not account for the increases experienced in demand for elective foot and ankle surgery.

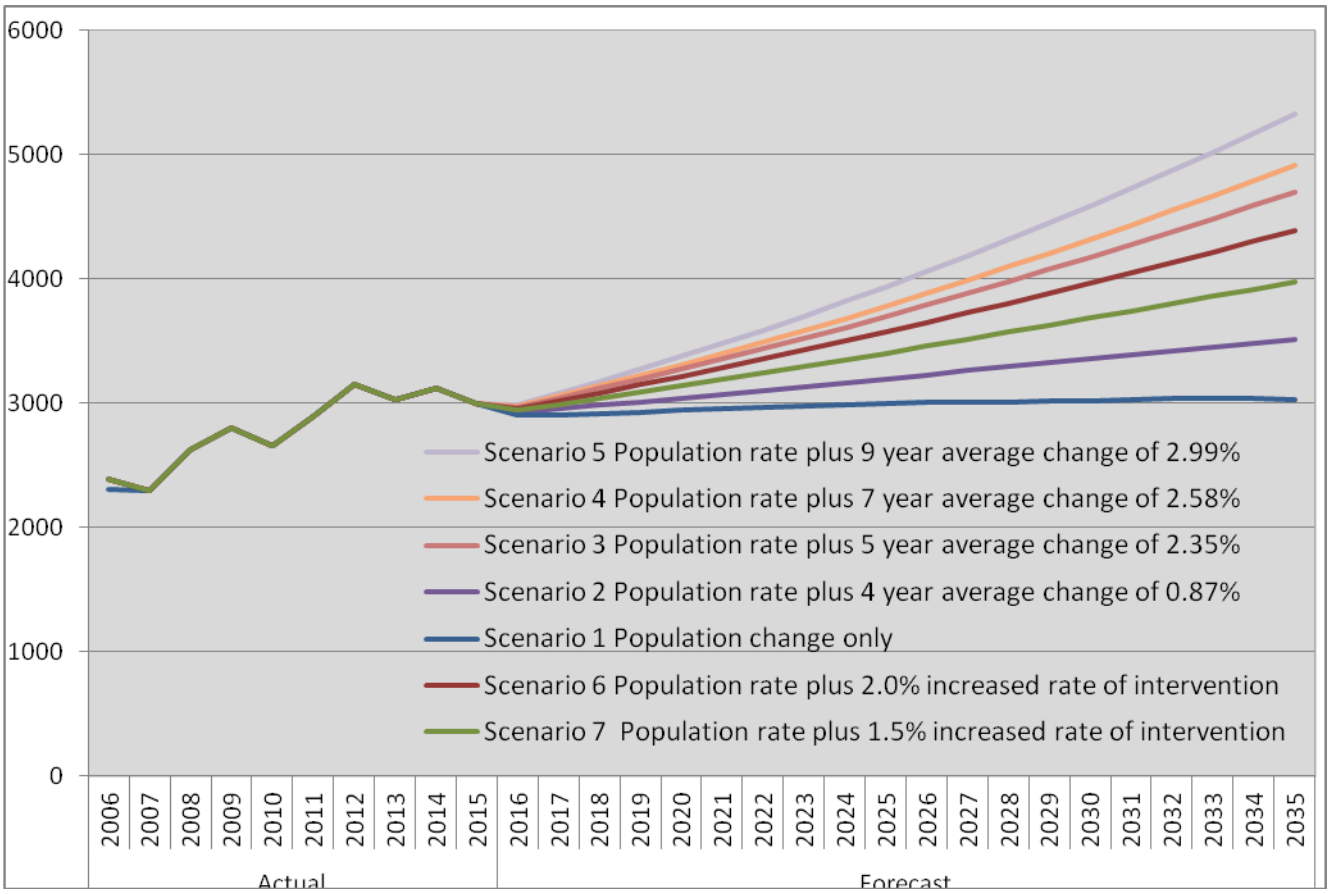
Figure 34: Change in F&A activity 2006 to 2015 – Elective and emergency split and actual elective activity



Year	Number of procedures	Annual Rate of Growth	Rate of Intervention per 100,000 population
2006	**2309**		93.6
2007	**2295**	-4.5%	89.4
2008	**2625**	13.9%	101.8
2009	**2800**	6.3%	108.2
2010	**2661**	-5.3%	102.5
2011	**2897**	8.3%	111.0
2012	**3158**	8.9%	120.9
2013	**3027**	-4.1%	115.9
2014	**3125**	3.0%	119.4
2015	**3000**	-4.4%	114.2

Figure 35 charts the modelled scenarios of population change only and various scenarios of population change and different rates of growth in intervention rates. Two scenarios have been identified as most likely – Scenario 2 the last 4 years activity trend – average growth of 0.87% per year, and Scenario 7 - slightly higher flat rate of 1.5% growth has also been modelled to assess the potential requirements for F&A surgery between now and 2035.

Figure 35: Demand Modelling Scenarios – F&A Procedures



When considering potential theatre throughput a breakdown of the top 20 procedures (see appendix A12) has identified that a minimum of 40% of procedures are forefoot procedures, the number of procedures per list has been reduced to an average of 4.5 recognising the more complex case mix of mid foot and hind foot and ankle procedures.

Figure 36: Outputs from the Modelled Demand Scenarios for F&A

Year	Scenario						
	Scenario 1 Population change only	Scenario 2 Population rate plus 4 year average change of 0.87%	Scenario 3 Population rate plus 5 year average change of 2.35%	Scenario 4 Population rate plus 7 year average change of 2.58%	Scenario 5 Population rate plus 9 year average change of 2.99%	Scenario 6 Population rate plus 2.0% increased rate of intervention	Scenario 7 Population rate plus 1.5% increased rate of intervention
2020	-57	44	274	311	377	218	140
Additional Theatres	-0.1	0.0	0.3	0.3	0.4	0.2	0.1
2025	2	199	700	784	938	575	404
Additional Theatres	0.0	0.2	0.7	0.8	0.9	0.6	0.4
2030	23	358	1178	1321	1587	968	686
Additional Theatres	0.0	0.4	1.2	1.3	1.6	1.0	0.7
2035	34	514	1702	1918	2326	1391	980
Additional Theatres	0.0	0.5	1.7	1.9	2.3	1.4	1.0

Note: the 'Additional Theatre' requirements above have been identified using the performance assumptions set out in Appendix A11

In summary the modelling exercise has identified the need for additional capacity for between 514 and 980 additional F&A procedures by 2035.

Assuming Scenario 7 is correct and there is a 10% productivity improvement (based on 2015 baseline of 3,000 F&A procedures) within the other WoS hospitals and an additional 300 procedures are delivered using existing resources, there will be a need for the GJF to expand and deliver a further 680 F&A

procedures by 2035. There will therefore be a requirement for 0.6 additional theatres.

Other Minor Leg Surgery

Detailed modelling has been completed for all minor leg procedures (e.g. Arthroscopy and ACL etc) using population forecast data and lower leg minor procedures by age band at the GJH in the calendar year of 2016 (see Figure 37) . As expected only 21% of lower leg minor procedures are carried out on patients over the age of 60, with 71% are carried out on patients aged between 16 and 59 - as a result we would not expect the demand for minor leg surgery to rise as fast as the demand for TKR or THR.

Figure 37: Lower Leg Minor Procedures - age at time of Intervention

Under 16	16 - 39	40-49	50-59	60-69	70-79	80 - 89	90 plus
8%	31%	20%	20%	13%	6%	2%	0%

Between 2006 and 2015, the volume of lower leg minor procedures rose from 5628 to 6392 procedures per annum a 17.8% increase in activity over a 10 year period. Over the last 10 years the activity trend has been very erratic, with large increases in activity as well as large declines in activity, making this sub speciality very difficult to model.

Figure 38 illustrates the increase in the rate of intervention per 100,000 population. In 2006 there were 220 procedures carried out per 100,000 population, by 2015 this figure had risen to 243 procedures per 100,000 population. In summary the rate of increase in intervention has not been solely driven by changes in demography it appears to be very influence by clinical practice –this could be as a result of the impact of realistic medicine. In the last 2 years the number of procedures undertaken has reduced by 20%.

Figure 38: Change in Lower leg Minor activity 2006 to 2015

Year	No of 100,000 popn	Rate of Intervention	Actual Activity
2006	25.54	220.4	**5628**
2007	25.66	236.1	**6058**
2008	25.78	265.0	**6831**
2009	25.87	290.4	**7514**
2010	25.97	264.5	**6871**
2011	26.10	263.2	**6871**
2012	26.13	275.0	**7184**
2013	26.13	309.1	**8077**
2014	26.17	258.9	**6776**
2015	26.27	243.3	**6392**

Figure 39: Demand Modelling Scenarios – Lower leg Minor Procedures

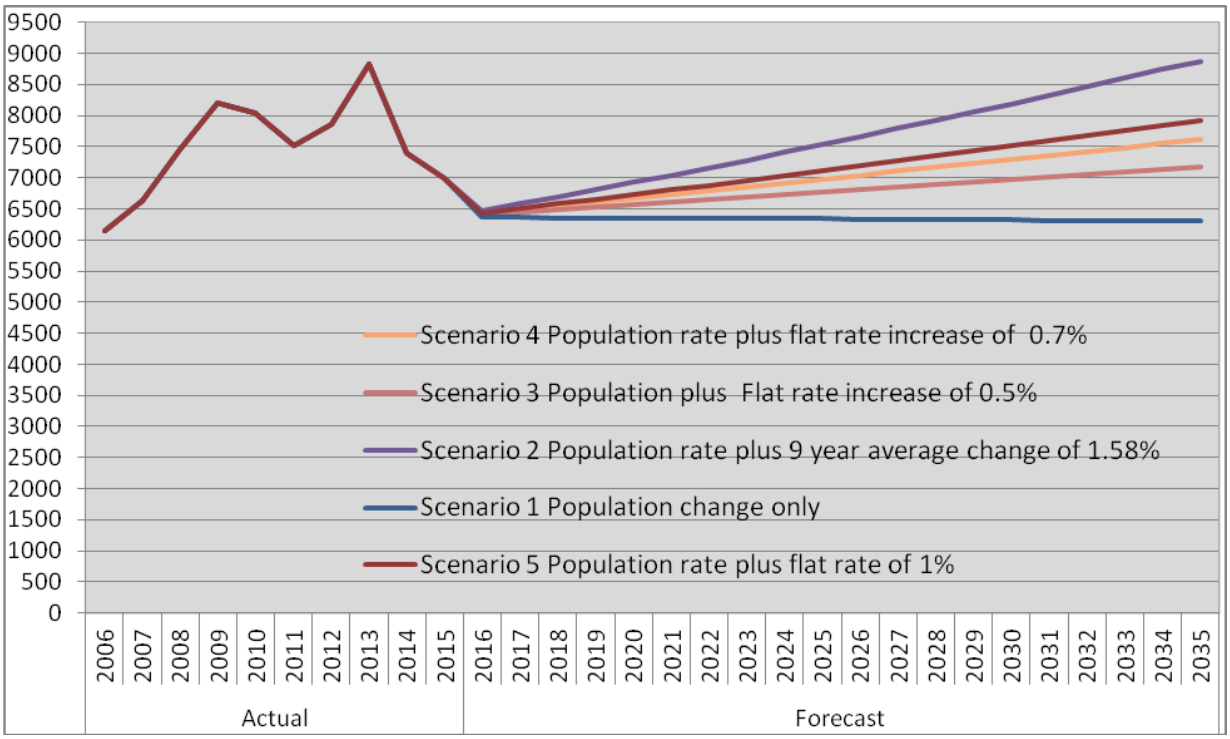


Figure 40: Outputs from the Modelled Demand Scenarios for F&A

Year	Scenario				
	Scenario 1 Population change only	Scenario 2 Population rate plus 9 year average change of 1.58%	Scenario 3 Population plus Flat rate increase of 0.5%	Scenario 4 Population rate plus flat rate increase of 0.7%	Scenario 5 Population rate plus flat rate of 1%
2020	-46	530	170	-325	335
Additional Theatres	0.0	0.3	0.1	-0.2	0.2
2025	-54	1142	378	583	723
Additional Theatres	0.0	0.6	0.2	0.3	0.4
2030	-75	1799	586	905	1125
Additional Theatres	0.0	1.0	0.3	0.5	0.6
2035	-95	2486	777	1217	1525
Additional Theatres	-0.1	1.4	0.4	0.7	0.9

Note: the 'Additional Theatre' requirements above have been identified using the performance assumptions set out in Appendix A11

In summary given the recent decline in lower leg minor procedures of 20% and given the age of intervention and a forecast decline in the number of people aged under 60 between now and 2035 it is difficult to envisage anything other than a small increase in lower leg procedures, which leads us to support scenario 3 population change plus 0.5% increase in intervention rate.

The modelling exercise has identified the need for a small amount of additional capacity 777 - additional procedures by 2035, almost all of this activity could be provided through clinical productivity improvements.

Hand and Wrist Procedures

Detailed modelling has been completed for all hand and wrist procedures using population forecast data and H&W procedures by age band in the WoS for the calendar year of 2016 (see Figure 41 and Figure 44). 54% of hand and wrist procedures are carried out between the age of 16 to and 59, with 41.69% of procedures performed on those aged 60 or above.

Figure 41: Hand and Wrist Procedures – age at time of intervention

0-15	16-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
4.17%	5.59%	7.88%	15.88%	24.79%	22.45%	14.25%	4.65%	0.34%

Between 2006 and 2015, the volume of H&W procedures rose from 4,692 to 6,445 procedures per annum a 37% increase in activity over a 10 year period. Over the last 10 years the primary activity trend has been upwards (apart from one small dip in activity in 2013) as shown in Figure 42.

A review of the elective emergency activity split over the last 10 years in hand and wrist surgery has identified a 20% decrease in emergency activity between 2010 and 2011, whilst this accounts for some of the increase in demand for elective surgery the chosen scenario is fairly conservative allowing for population change plus 1% growth in activity and does not reflect the significantly higher increase in activity experienced between 2005 and 2009.

Figure 42: Hand and Wrist Elective and Emergency Split and Change in Hand and Wrist activity 2006 to 2015

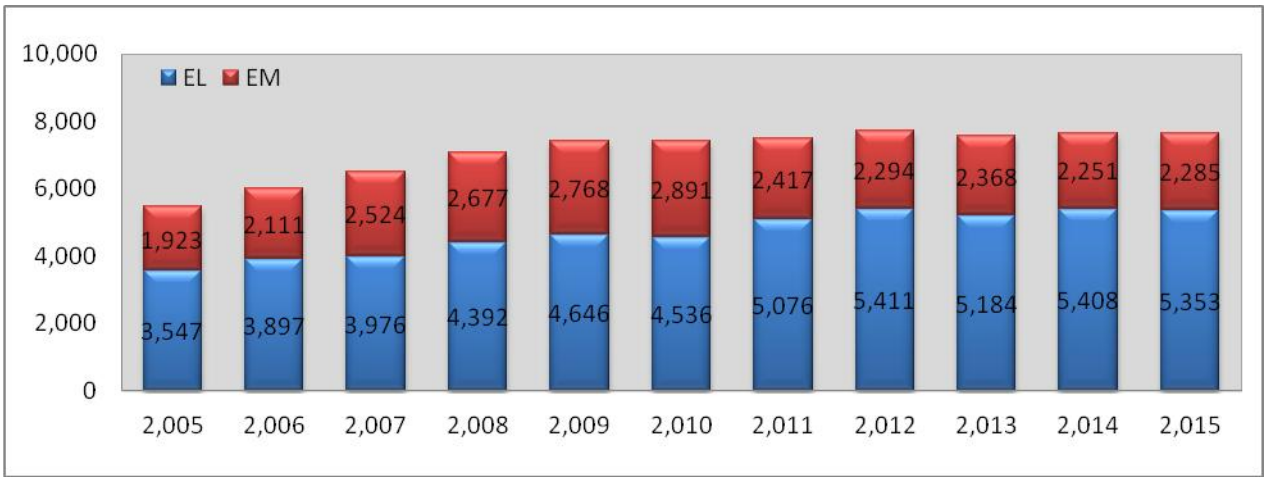
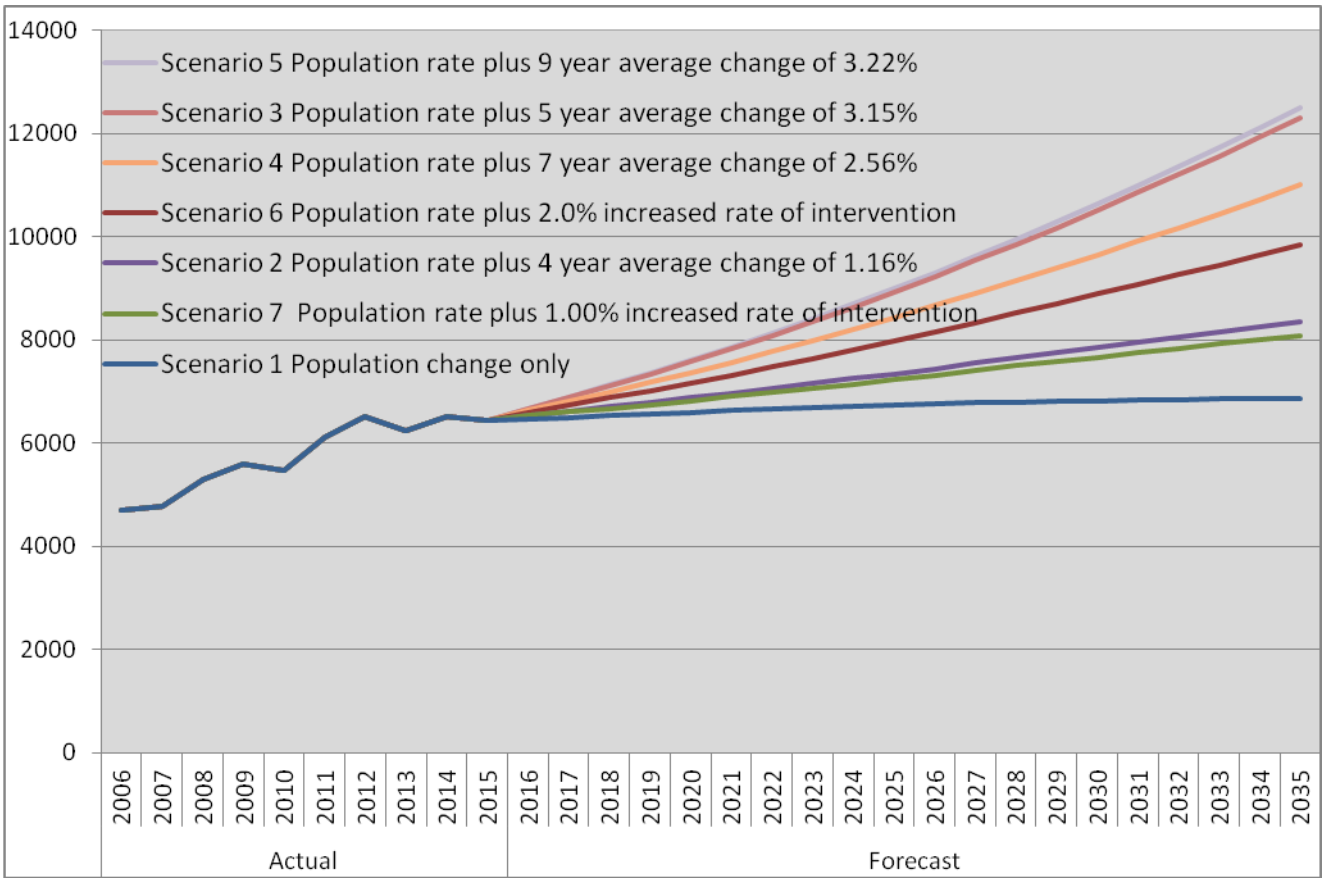


Figure 43: Increase in rate of intervention per 100,000 population

Year	No of 100,000 popn	Rate of Intervention	Actual Activity
2006	20.86	225.0	**4692**
2007	21.00	228.0	**4787**
2008	21.14	250.2	**5288**
2009	21.26	263.1	**5594**
2010	21.39	255.3	**5461**
2011	21.54	283.7	**6111**
2012	21.58	301.8	**6515**
2013	21.61	288.8	**6241**
2014	21.68	300.4	**6511**
2015	21.77	296.0	**6445**

Figure 43 illustrates the increase in the rate of intervention per 100,000 population. In 2006 there were 225 procedures carried out per 100,000 population, by 2015 this figure had risen to 296 procedures per 100,000 population. In summary the rate of increase in intervention has not been solely driven by changes in demography, there has been a shift towards higher rates of hand and wrist surgeries being performed.

Figure 44: Demand Modelling Scenarios – Hand and Wrist Procedures



When considering potential theatre throughput a breakdown of the top 20 procedures (see appendix A12) has identified that a minimum of 38% of procedures are carpal tunnel release procedures, the number of procedures per list has been reduced to an average of 8 recognising the overall case mix.

Figure 45: Outputs from the Modelled Demand Scenarios for Hand and Wrist

Year	Scenario						
	Scenario 1 Population change only	Scenario 2 Population rate plus 4 year average change of 1.16%	Scenario 3 Population rate plus 5 year average change of 3.15%	Scenario 4 Population rate plus 7 year average change of 2.56%	Scenario 5 Population rate plus 9 year average change of 3.22%	Scenario 6 Population rate plus 2.0% increased rate of intervention	Scenario 7 Population rate plus 1.00% increased rate of intervention
2020	154	432	1135	924	1164	724	379
Additional Theatres	0.1	0.2	0.6	0.5	0.7	0.4	0.2
2025	303	902	2480	1990	2549	1538	789
Additional Theatres	0.2	0.5	1.4	1.1	1.4	0.9	0.4
2030	372	1404	4066	3212	4187	2445	1224
Additional Theatres	0.2	0.8	2.3	1.8	2.4	1.4	0.7
2035	410	1899	5871	4555	6060	3406	1644
Additional Theatres	0.2	1.1	3.3	2.6	3.4	1.9	0.9

Note: the 'Additional Theatre' requirements above have been identified using the performance assumptions set out in Appendix A12

In summary the modelling exercise has identified the need for additional capacity for between 1644 and 1899 additional hand and wrist procedures by 2035.

Assuming Scenario 7 is correct and there is a 10% productivity improvement (based on 2015 baseline of 6445 H&W procedures) within the other WoS hospitals and an additional 644 procedures are delivered using existing resources, there will be a need for the GJF to expand and deliver a further 1000 H&W procedures by 2035. There will therefore be a requirement for 0.6 additional theatres.

Shoulder, Elbow and Upper Arm Procedures

Detailed modelling has been completed for all upper limb procedures using population forecast data and upper limb procedures by age band in the WoS for the calendar year of 2016 (see figure 12) . 61% of procedures are carried out between the age of 16 to and 59, with only 37% of procedures performed on those aged 60 or above.

Figure 46: Shoulder, Elbow and upper limb procedures – age at time of intervention

0-15	16-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
2.37%	13.70%	8.22%	19.05%	20.05%	19.30%	13.95%	3.24%	0.12%

Between 2006 and 2015, the volume of upper limb procedures rose from 1053 to 1402 procedures per annum a 33% increase in activity over a 10 year period. Over the last 10 years the primary activity trend has been upwards, further discussion is needed to understand the trend which although overall has risen, activity decreased in 2010 and 2011, and in 2014 and 2015.

Figure 47: Change in Shoulder Elbow and upper arm activity 2006 to 2015

Year	No of 100,000 popn	Population Change only - Rate of Intervention	Actual Activity
2006	20.86	50.5	**1053**
2007	21.00	58.8	**1236**
2008	21.14	58.2	**1230**
2009	21.26	71.2	**1515**
2010	21.39	65.2	**1395**
2011	21.54	59.4	**1279**
2012	21.58	69.6	**1502**
2013	21.61	72.2	**1561**
2014	21.68	67.3	**1459**

2015	21.77	64.4	**1402**

Figure 47 illustrates the increase in the rate of intervention per 100,000 population. In 2006 there were 50 procedures carried out per 100,000 population, by 2015 this figure had risen to 64 procedures per 100,000 population.

Figure 48: Demand Modelling Scenarios – Upper limb Procedures

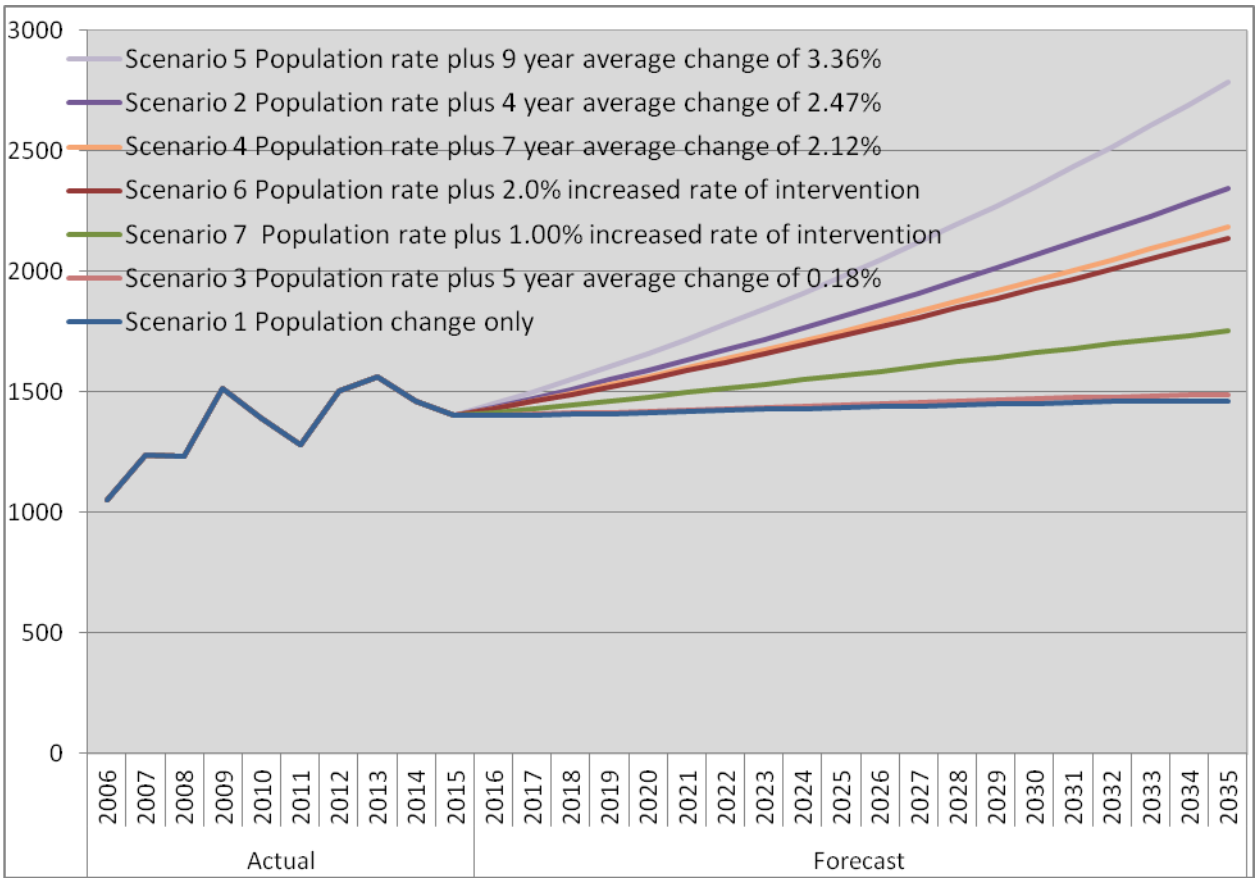


Figure 49: Outputs from the Modelled Demand Scenarios for upper limb

Year	Scenario						
	Scenario 1 Population change only	Scenario 2 Population rate plus 4 year average change of 2.47%	Scenario 3 Population rate plus 5 year average change of 0.18%	Scenario 4 Population rate plus 7 year average change of 2.12%	Scenario 5 Population rate plus 9 year average change of 3.36%	Scenario 6 Population rate plus 2.0% increased rate of intervention	Scenario 7 Population rate plus 1.00% increased rate of intervention
2020	12	188	18	161	258	152	77
Additional Theatres	0.0	0.2	0.0	0.2	0.3	0.2	0.1
2025	35	410	43	349	574	328	166
Additional Theatres	0.0	0.4	0.0	0.4	0.6	0.3	0.2
2030	50	664	69	559	949	525	260
Additional Theatres	0.1	0.7	0.1	0.6	1.0	0.5	0.3
2035	60	940	88	784	1382	733	351
Additional Theatres	0.1	0.9	0.1	0.8	1.4	0.7	0.4

Note: the 'Additional Theatre' requirements above have been identified using the performance assumptions set out in Appendix A12

In summary given recent activity trends it is difficult to predict the future activity trend. However over the last 10 year activity has risen by 33%.

Probably the most accurate scenario is scenario 7 – assuming an increase of a further 351 procedures by 2035.

Assuming Scenario 7 is correct and there is a 10% productivity improvement (based on 2015 baseline of 1053 upper limb procedures) within the other WoS hospitals and an additional 105 procedures are delivered using existing resources, there will be a need for a further 246 procedures procedures by 2035. There will therefore be a requirement for 0.3 additional theatres.

It is important to note that as the GJF do not currently provide Should er and elbow surgery, it is assumed that the GJF will offer additional primary Hip and Knee arthroplasty capacity to enable the predicted additional shoulder and elbow activity to be carried out within the WoS Hospitals.

Summary of Predicted Orthopaedic Theatre Requirements

Figure 50 provides a summary overview of the forecast demand within orthopaedics and the proposed capacity that would be provided either through productivity improvement at existign WoS hospitals where orthopaedic surgery is carried out or thorugh the expansion of orthopaedic facilities at the GJF.

Figure 50: Summary of the Theatre and outpatient / pre operative assessment requirements for orthopaedic elective care between now and 2035

Maximum	Max Additional Procedures by 2035	GJF Additional Capacity	Minimum No of additional GJF Theatres required by 2035	Other WoS Hospital - Productivity Improvement to be delivered within West Hospitals	
Primary Knee Replacement	2211	1796	2.1	10% of 2015 Activity base - 415 joints	Approx 10,314 additional new outpatient consultations and Approx 5,500 additional pre operative asessment appointments– (assuming average of 50% conversion)
Primary Hip replacement	1530	1171	1.4	10% of 2015 Activity base - 359 joints	
Revision Arthroplasty (Hip and Knee)	405	405	0.9	n/a	
Foot and Ankle Procedures	980	680	0.7	10% of 2015 Activity base – 300 procedures	
Lower Leg Minor Procedures	777	-	-	12% of 2015 Activity base- 777 procedures	
Hand and Wrist Procedures	1644	1000	0.6	10% of 2015 activity base 644 procedures	
Shoulder and Elbow Procedures	351	246	0.3	10% of 2015 activity base 105 procedures	
All Procedures	**7,898**	**5,298**	**6.0**	**2,600**	

4.1.5 Demand Modelling - Diagnostic and Therapeutic Endoscopy

A detailed demand modelling exercise for upper and lower GI endoscopy is outlined within this section of the IA. In light of the current significant waiting time pressures within NHS GGC there is potential for the West Elective expansion at the GJF to provide additional endoscopy capacity, to support the delivery of improved diagnostic endoscopy waiting times, which in turn will help support the delivery of the 62 day cancer pathway.

Within the West region in 2015 approx 19% of endoscopies were therapeutic and 81% were diagnostic.

Current WoS Activity

Across the West of Scotland there has been a 28% increase in all (diagnostic and therapeutic) endoscopy activity in the last 9 years with the total number of endoscopies rising from 53,980 to 69,154 procedures per annum. Overall the trend is upwards, with a very slight reduction in activity in 2012/ 2013, however in 2014 activity returned to the same level as in 2011 and increased again in 2015.

The split of upper and lower GI activity is fairly even at approx 50%. For modelling purposes it is assumed that each scope list are restricted to a maximum of 24 points per day / 12 points per session (as defined by the Golbal Rating Scale) and that each Upper GI patient is equivalent of 1 point and lower GI scope is equivalent of 2 points.

It is important to note that within the data - 90% of patients have only one procedure on admission however 10% will have more than one procedure this has been adjusted within the demand modelling.

Figure 51: WoS Upper and Lower Endoscopy – Diagnostic and Therapeutic Activity

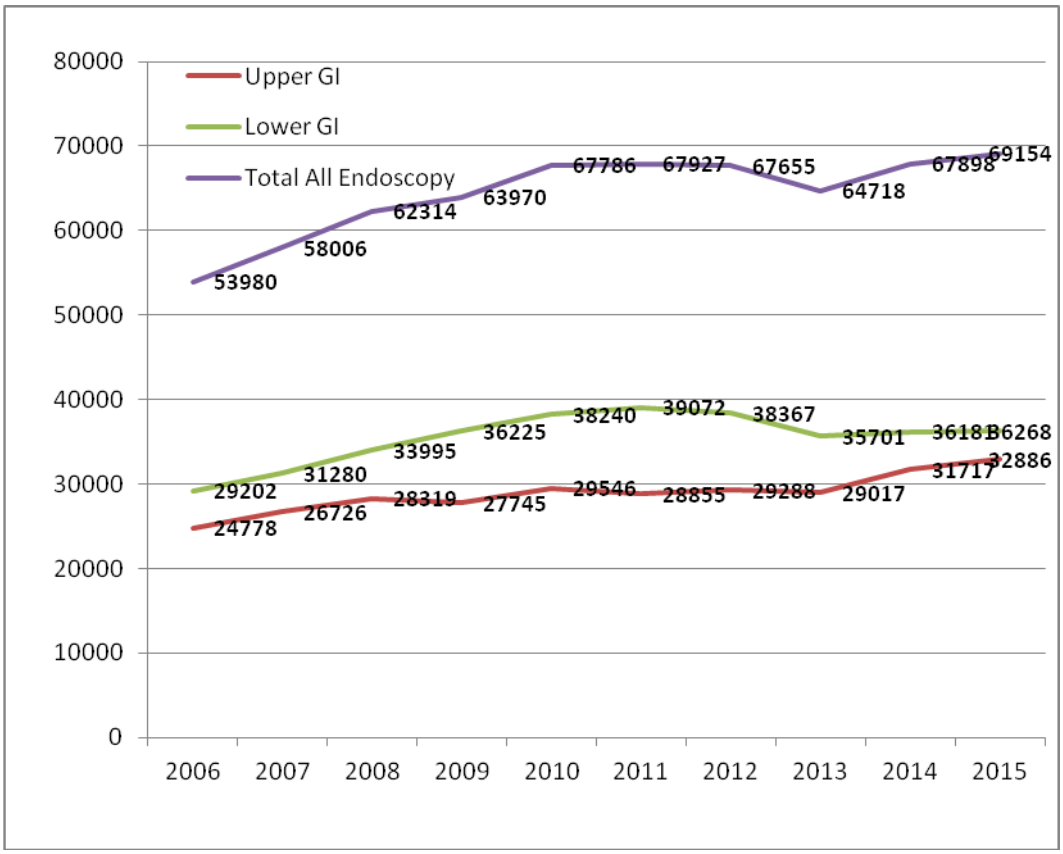


Figure 52: Summary of WOS endoscopy activity in 2015

Procedure	Diagnostic	Therapeutic	Total
Upper GI	29,713	3,173	32,886
Lower GI	28,440	7,828	36,268
Total	**58,153**	**11,001**	**69,154**

Figure 53: WoS Upper and Lower GI – Diagnostic Activity

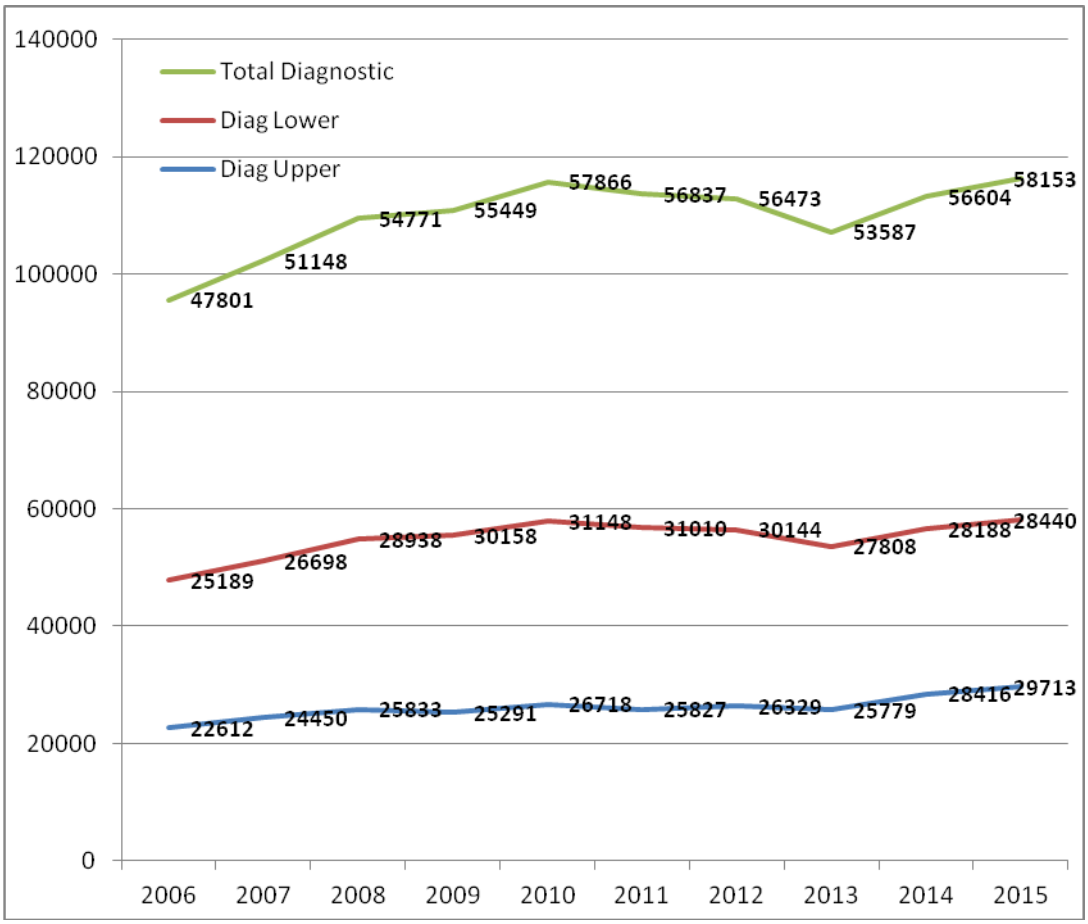
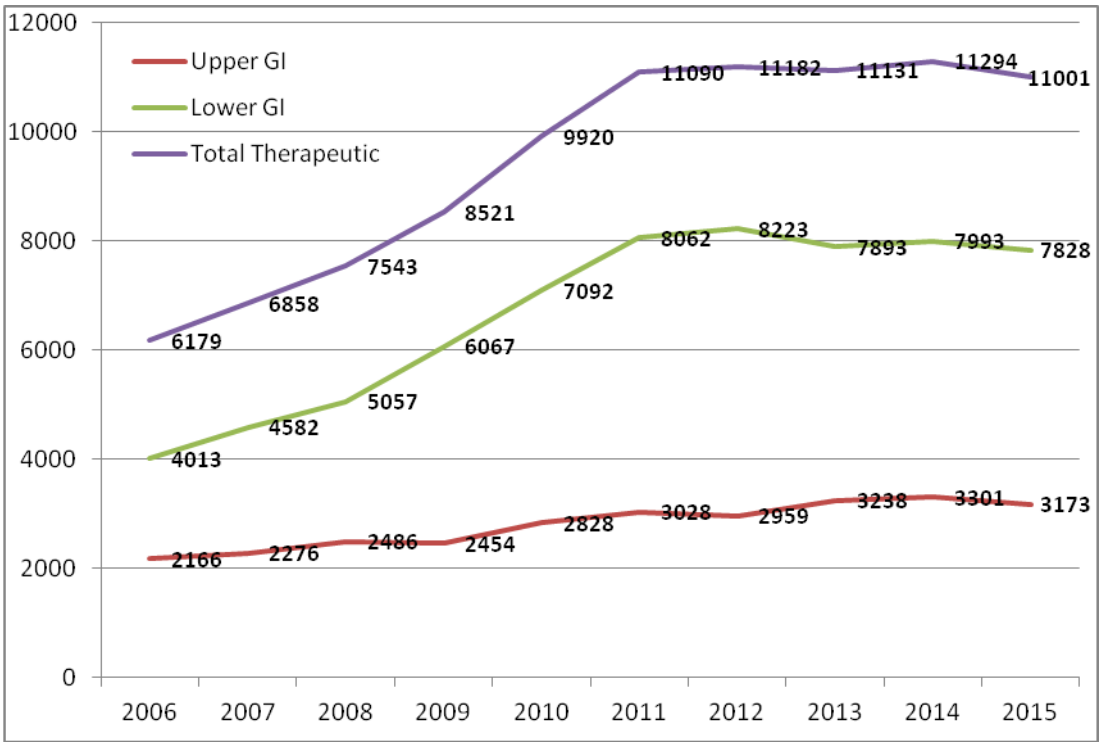


Figure 54: WoS Upper and Lower GI – Therapeutic Activity



Current GJH Activity

At present the GJH provide a relatively small endoscopy service providing capacity for approx 1950 endoscopies per year – at present this capacity supports NHS A&A (70) NHS FV (350) NHS L (1530), the majority of the referrals are diagnostic lower GI / colonoscopy referrals. However, currently there are long waiting times that we are unable to support due to our lack of theatre capacity.

Forecasting Future demand for Endoscopy

In line with other demand modelling undertaken to date the WOS Health Board age at time of intervention was analysed for each endoscopic procedure and applied to the population forecast data. Figure 55 provides a summary of the proportion of patients in each age range category at the time of intervention.

Figure 55: WoS HB of Residence Patients - Intervention Rate by Age and procedure - Calendar Year

Age Range	0-15	16-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
Diagnostic Upper GI	1.59%	5.74%	6.96%	14.17%	21.71%	23.43%	18.66%	7.37%	0.37%
Diagnostic Lower GI	0.17%	6.50%	8.41%	14.69%	22.86%	24.93%	16.82%	5.42%	0.19%
Therapeutic Upper GI	0.35%	2.73%	4.71%	8.07%	18.03%	23.05%	26.76%	14.73%	1.57%
Therapeutic Lower GI	0.01%	0.60%	2.17%	7.45%	23.14%	34.64%	25.35%	6.41%	0.22%

Over 66% of all therapeutic procedures are carried out on patients aged over 60, whilst approx 50% of diagnostic endoscopies are carried out on patients over 60. Given the increase in the forecast population aged over 60 it is likely that there will be significant increased demand for endoscopy between now and 2035.

Diagnostic Upper GI Demand Modelling

Detailed demand modelling has been completed for Diagnostic upper GI endoscopy using population forecast data and age at time of intervention in the calendar year of 2015. The graph below provides an overview of the scenarios modelled ranging from population growth to the 4 year average rate of change of 3.38%.

Figure 56: Demand modelling scenarios – Diagnostic Upper GI Endoscopy

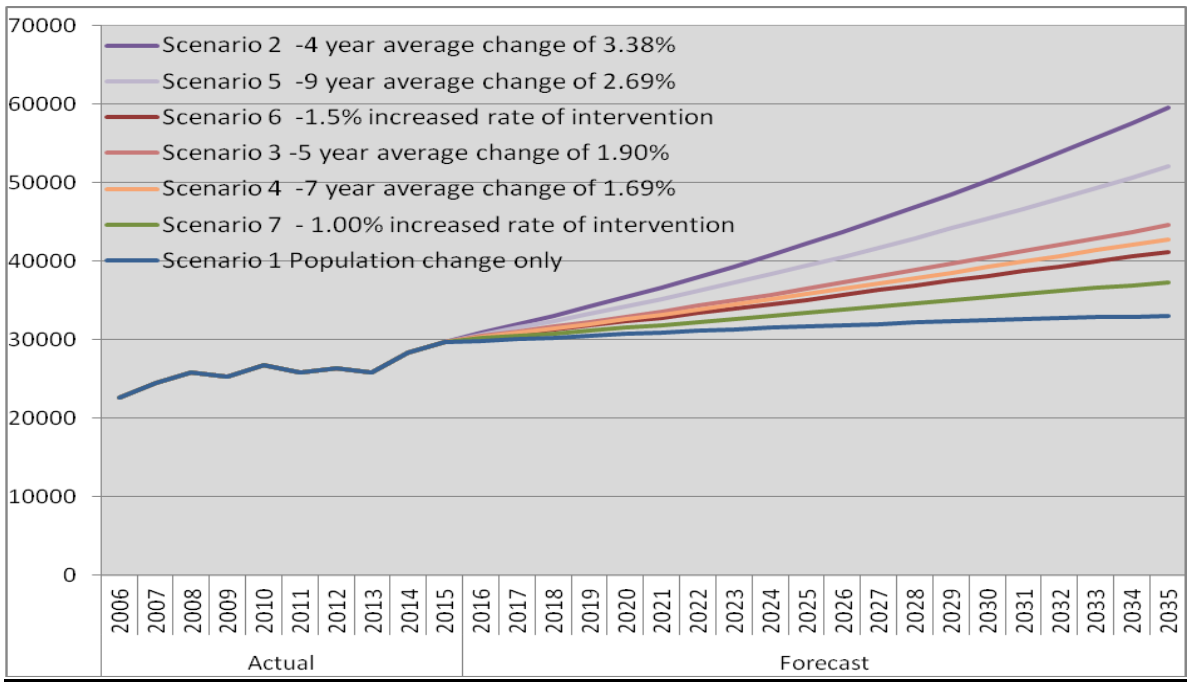


Figure 57: Output from the modelled demand scenarios for Diagnostic upper GI

Year	Scenario						
	Scenario 1 Population change only	Scenario 2 -4 year average change of 3.38%	Scenario 3 -5 year average change of 1.90%	Scenario 4 -7 year average change of 1.69%	Scenario 5 -9 year average change of 2.69%	Scenario 6 -1.5% increased rate of intervention	Scenario 7 - 1.00% increased rate of intervention
2020	1004	5686	3219	2886	4514	2578	1790
Additional Procedure Rm	0.2	1.1	0.6	0.6	0.9	0.5	0.3
2025	2007	12449	6777	6043	9703	5370	3680
Additional Procedure Rm	0.4	2.4	1.3	1.2	1.9	1.0	0.7
2030	2736	20512	10727	9513	15687	8411	5689
Additional Procedure Rm	0.5	4.0	2.1	1.9	3.1	1.6	1.1
2035	3266	29817	14879	13103	22316	11506	7630
Additional Procedure Rm	0.6	5.8	2.9	2.6	4.4	2.2	1.5

Note: the 'Additional Theatre' requirements above have been identified using the performance assumptions set out in Appendix A12.

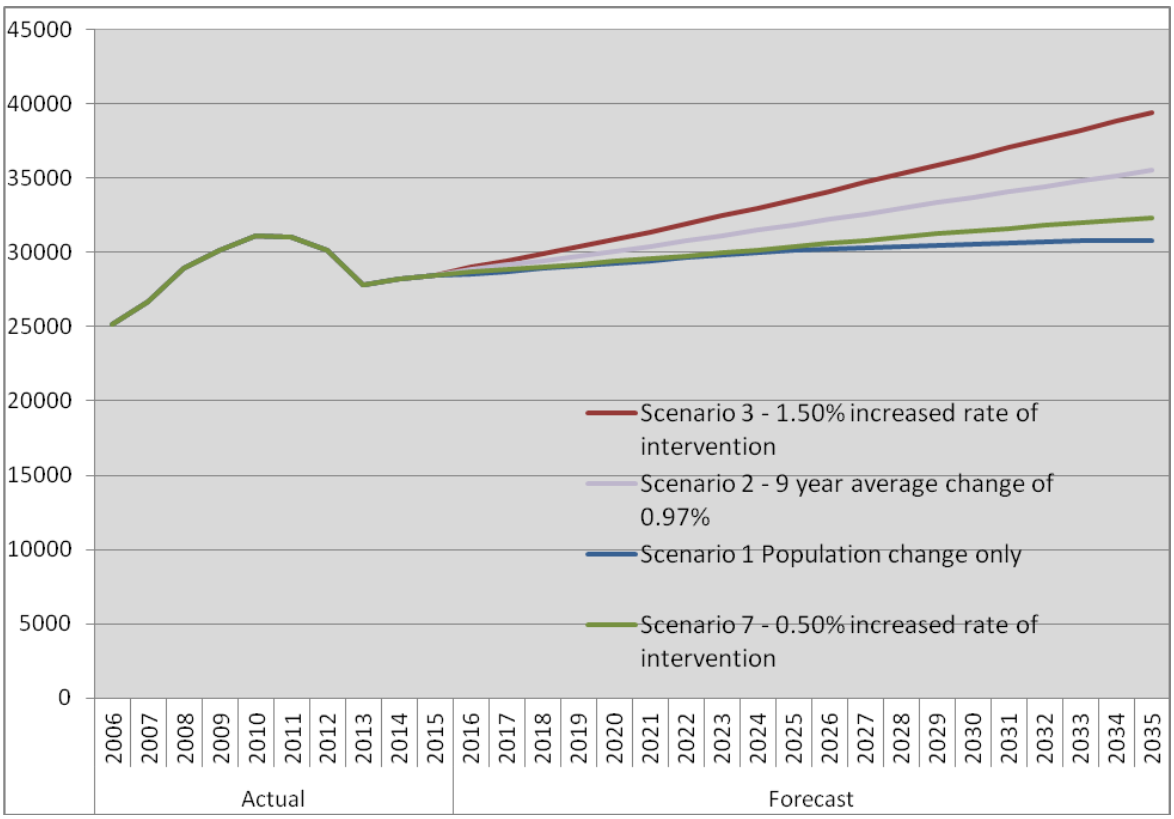
The above is based on a 48.8 week year, with a 5% cancellation / DNA rate and equivalent of 24 points per day and assumes each procedure equivalent of 1 point. Looking at previous trends scenario 6 (1.5% increase in rate of intervention) and 7 (1% increase in rate of intervention) appear to follow previous activity

trends and would require between 1.5 and 2.2 additional procedure rooms by 2035, population change alone would drive the need for 0.6 of an additional procedure room.

Diagnostic Lower GI Demand Modelling

Detailed demand modelling has been completed for diagnostic lower GI endoscopy using population forecast data and age at time of intervention in the calendar year of 2015. The graph below provides an overview of the scenarios modelled ranging from population growth to a flat average rate of change of 1.5%. After many years of continual increases in lower GI endoscopies, most likely as a result of the national bowel screening programme (commenced in June 2007 and fully implemented by Dec 2009) in 2012 and 2013,there was a reduction in the number of endoscopies performed and activity has started to rise again and is currently at the same level as it was in 2008. The National Bowel Screening programme report in May 2015 identified a slight reduction in both the overall patient uptake and a significant reduction in the number of patients who have self referred in one cycle – this combined with a probable reduction in public awareness following a high profile campaign at the programme launch may partially explain the reduction in activity in 2012 and 2013.

Figure 58: Demand modelling scenarios – Diagnostic Lower GI Endoscopy



After discussion with the West of Scotland Engagement Group, the forecast figures were adjusted to reflect the potential impact of the new QFit test that is likely to be rolled out across every Health Board in the coming months. In the early pilot of the QFit test there was an indication that the roll out of the test could reduce demand for lower GI endoscopy by up to 40%, however anecdotally where the test has been

rolled out given the increased public awareness and publicity take up of National Bowel screening appears to be on the rise and to date Health Boards are reporting slight increase in bowel screening uptake which is driving an increase in demand for endoscopy.

However given we are forecasting over a much longer timeframe a 40% reduction in demand for lower GI endoscopy has been applied to each scenario. Outputs for each scenario are outlined in the table below which indicates the number of additional endoscopies required and the potential procedure room requirements.

Figure 59: Output from the modelled demand scenarios for Diagnostic Lower GI – incorporating 40% reduction in demand due to QFIT testing

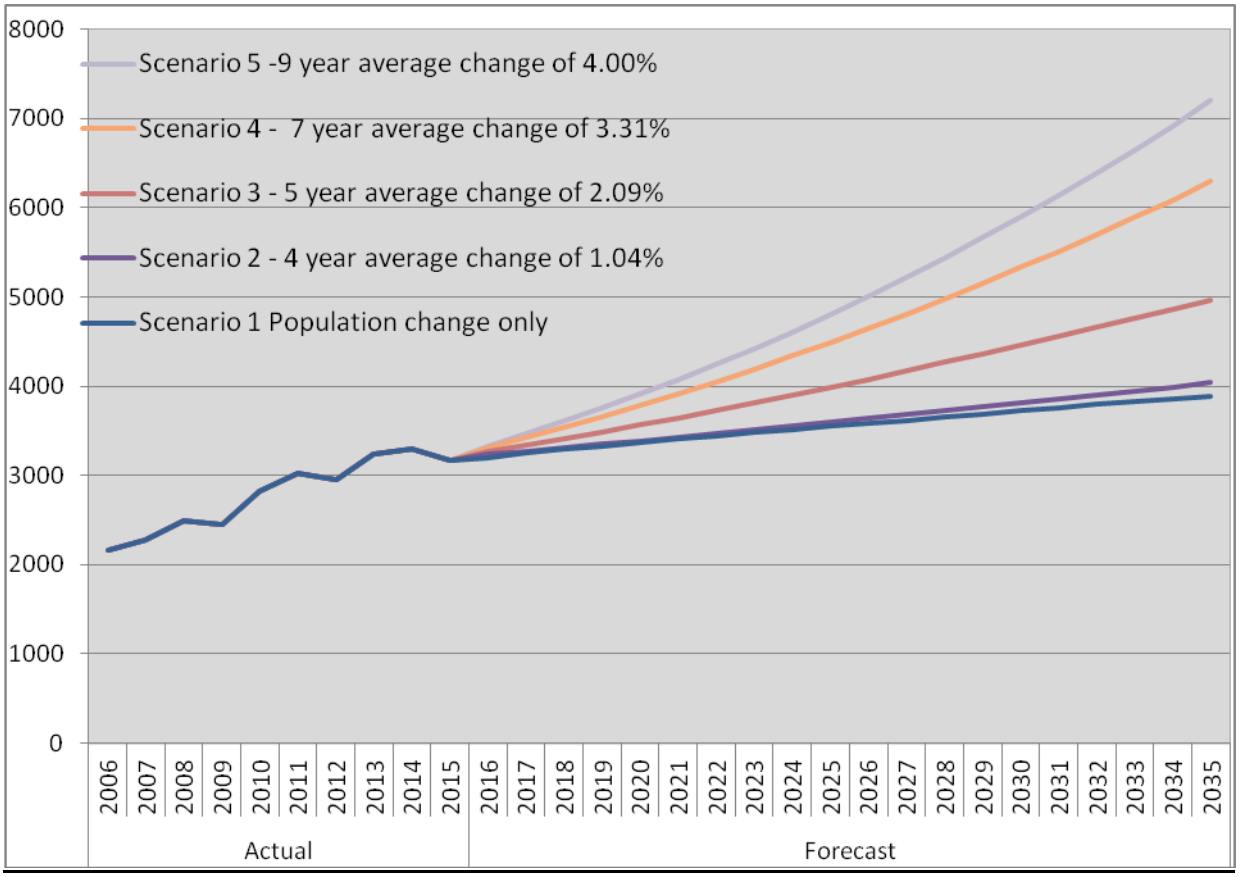
Year	Scenario		
	Scenario 1 Population change only	Scenario 2 - 9 year average change of 0.97%	Scenario 7 - 0.50% increased rate of intervention
2020	542	1087	630
Additional Procedure Rm	0.2	0.4	0.2
2025	1102	2247	1290
Additional Procedure Rm	0.4	0.9	0.3
2030	1408	3477	1975
Additional Procedure Rm	0.5	1.4	0.8
2035	1554	4661	2577
Additional Procedure Rm	0.6	1.8	1.0

The above is based on a 45 week year, with a 5% cancellation / DNA rate and equivalent of 24 points per day and assumes each procedure equivalent of 2 points. Looking at previous trends scenario 7 (average rate of change of 0.50%) appears to follow previous activity trends seems sensible and would require approx 1.0 additional procedure rooms by 2035, population change alone would drive the need for 0.6 of an additional procedure room.

Therapeutic Upper GI

Detailed demand modelling has been completed for Therapeutic Upper GI endoscopy using population forecast data and age at time of intervention in the calendar year of 2015. Figure 60 below provides an overview of the scenarios modelled ranging from population growth to a 9 year average rate of change of 4.0%. Demand for upper GI Therapeutic endoscopy activity has incrementally increased year on year from a base of 2,166 to 3,163 procedures per annum, this is a 46.5% increase in activity over the last 9 years.

Figure 60: Demand modelling scenarios – Therapeutic Upper GI Endoscopy



The initial draft outputs from the model are outlined in the table below which indicates the number of additional endoscopies required and the potential procedure room requirements.

Figure 61: Output from the modelled demand scenarios for Therapeutic upper GI

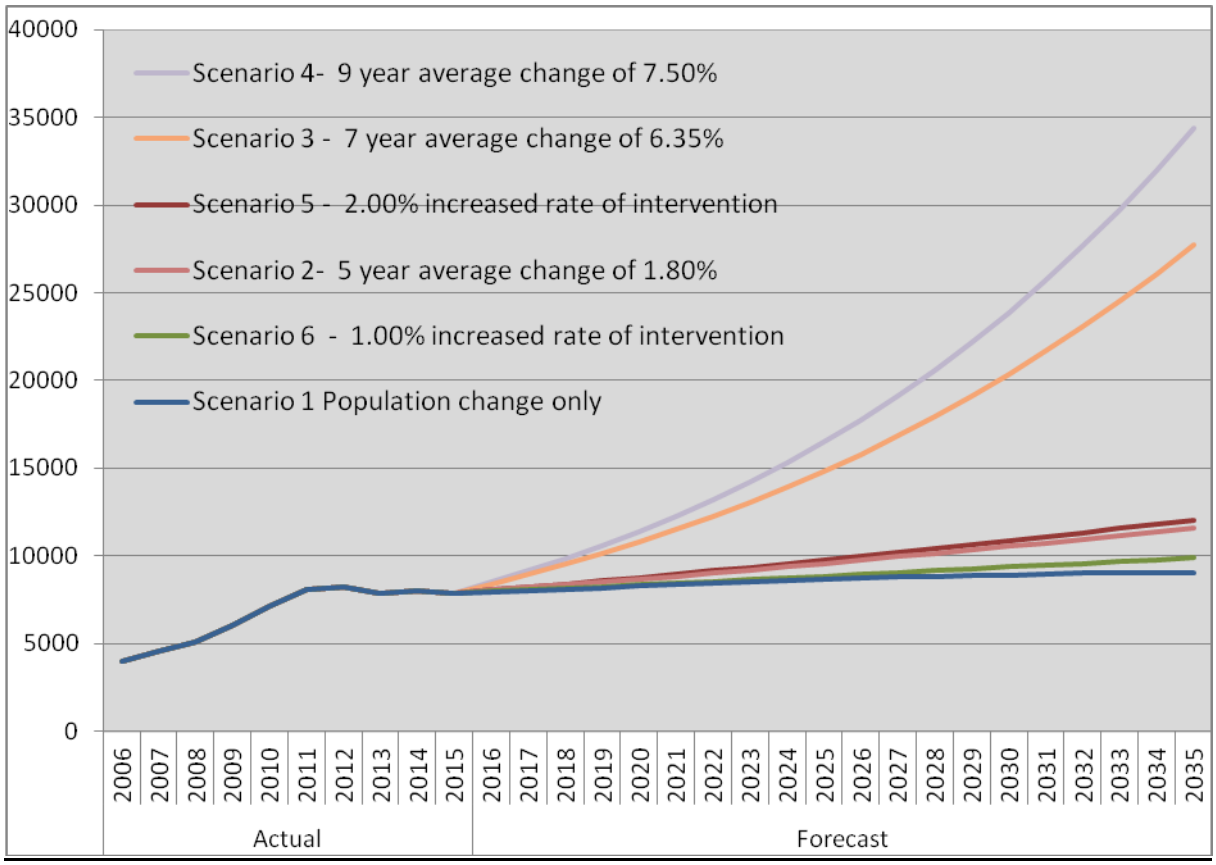
Year	Scenario						
	Scenario 1 Population change only	Scenario 2 - 4 year average change of 1.04%	Scenario 3 - 5 year average change of 2.09%	Scenario 4 - 7 year average change of 3.31%	Scenario 5 -9 year average change of 4.00%	Scenario 6 - 2.00% increase	Scenario 7 - 1.50% increase
2020	197	213	393	611	740	377	291
Additional Procedure Rm	0.1	0.1	0.2	0.2	0.3	0.1	0.1
2025	377	423	816	1318	1629	780	591
Additional Procedure Rm	0.1	0.2	0.3	0.5	0.6	0.3	0.2
2030	552	647	1289	2157	2721	1230	917
Additional Procedure Rm	0.2	0.3	0.5	0.8	1.1	0.5	0.4
2035	707	864	1794	3122	4024	1706	1249
Additional Procedure Rm	0.3	0.3	0.7	1.2	1.6	0.7	0.5

The above is based on a 45 week year, with a 5% cancellation / DNA rate and equivalent of 24 points per day and assumes each procedure equivalent of 1 point. Looking at previous trends scenario 3 (5 year average rate of change of 2.09%) appears to follow previous activity trends and would require approx 0.7 additional procedure rooms by 2035, population change alone would drive the need for 0.3 of an additional procedure room.

Therapeutic Lower GI

Detailed demand modelling has been completed for Therapeutic Lower GI endoscopy using population forecast data and age at time of intervention in the calendar year of 2015. The graph below provides an overview of the scenarios modelled ranging from population growth to a 9 year average rate of change of 7.5%. Demand for lower GI Therapeutic endoscopy activity has incrementally increased year on year from a base of 4,013 to 7,828 procedures per annum, this is a 95% increase in activity over the last 9 years.

Figure 62: Demand modelling scenarios – Therapeutic Lower GI Endoscopy



The initial draft outputs from the model are outlined in the table below which indicates the number of additional endoscopies required and the potential procedure room requirements. These will be reviewed further as the modelling is developed and the target operating model is further refined.

Figure 63: Output from the modelled demand scenarios for Therapeutic Lower GI

Year	Scenario					
	Scenario 1 Population change only	Scenario 2- 5 year average change of 1.80%	Scenario 3 - 7 year average change of 6.35%	Scenario 4- 9 year average change of 7.50%	Scenario 5 - 2.00% increased rate of intervention	Scenario 6 - 1.00% increased rate of intervention
2020	440	844	2966	3561	931	510
Additional Procedure Rm	0.1	0.2	0.6	0.7	0.2	0.1
2025	854	1733	6983	8662	1925	1010
Additional Procedure Rm	0.2	0.3	1.4	1.7	0.4	0.2
2030	1084	2714	12500	16052	3034	1541
Additional Procedure Rm	0.2	0.5	2.4	3.1	0.6	0.3
2035	1222	3738	19930	26580	4208	2055
Additional Procedure Rm	0.2	0.7	3.9	5.2	0.8	0.4

The above is based on a 45 week year, with a 5% cancellation / DNA rate and equivalent of 24 points per day and assumes each procedure equivalent of 1 point. Looking at previous trends scenario 2 (5 year average rate of change of 1.80%) and scenario 5 (2% average rate of change) both appear to follow

previous activity trends and would require approx 0.7 – 0.8 additional procedure rooms by 2035, population change alone would drive the need for 0.2 of an additional procedure room.

Summary of Demand Forecast for Endoscopy

In summary, even with the introduction of QFIT testing that is hoped will significantly reduce demand for lower GI diagnostic endoscopy, there is a requirement for additional endoscopy capacity across the region – for both diagnostic and therapeutic endoscopy. GJF currently provide approx 1,850 diagnostic endoscopies per annum, given lower GI patients cannot be expected to travel significant distance for their procedure, the vast majority of patients treated at the GJF are from NHS Lanarkshire. Figure x provides a summary of the demand forecast based on population change only and the demand forecast based on population change plus small increase in intervention rates year on year.

Figure 64: Summary of Potential Endoscopy Requirements for WoS

Procedure	Additional Procedure Rooms Required	
	Population only	Demand Forecast – Potential Scenario
Diagnostic Upper GI	0.6	1.5
Diagnostic Lower GI	0.9	1.0
Sub Total Diagnostic Endoscopy	**1.5**	**2.5**
Therapeutic Upper GI	0.3	0.7
Therapeutic Lower GI	0.2	0.7
Sub Total Therapeutic Endoscopy	**0.5**	**1.4**

In summary, there is likely to be a requirement for a minimum of 4 endoscopy rooms within the region, given it is not practical to expect patients to travel significant distance for lower GI endoscopy, it is proposed that this activity is delivered through a combination of expansion of the GJF endoscopy capacity with the remaining capacity provided at local hospitals, potentially through extending the hours of existing endoscopy facilities. Given the current significant waiting time pressures within diagnostic endoscopy and the NHS GJF experience is that patients are much more willing to travel for diagnostic endoscopy, it is proposed that the GJF provide additional capacity for diagnostic endoscopy.

In undertaking the demand modelling no assumptions have been made with regards improved clinical productivity – in line with JAG accreditation modelling has assumed each upper scope is 1 point and each lower scope is 2 points with each list being constrained to a maximum of 24 points in one day.

4.1.6 Demand Modelling - General Surgery and Urology

Detailed demand modelling has been undertaken for general surgery and urology using population forecast data and looking at previous year's activity trends.

The age profile of patients' at time of intervention for general surgery and urology is very different to that of patients undergoing TKR or THR, with approx 30 – 40% of general surgery patients being aged over 60 at the time of intervention and 50 – 60% of urology patients aged over 60 at time of intervention, (whereas 80% THR and 84% of TKR patients are over 60 years old at time of intervention). Therefore, given the main demographic change between now and 2035 is the significant increase in the number of people aged over 60 , it is assumed that any forecast increase in demand for general surgery or urology will not be as significant as the demand in orthopaedics.

It is important to note that GJF does not currently provide a Urology service, given the sub specialist nature of the service and the significant work that has already been undertaken to develop a regional model for urology services, it may not be considered appropriate for the GJF to also provide elective urology services. However in order to ensure a full assessment is made of the forecast future elective demand for the West region, both general surgery and urology demand modelling has been undertaken. It is therefore assumed that the predicted future urology demand will be considered as the regional model is developed and it is likely to be provided within the existing hospitals providing urology services.

Figure 65 illustrates the change in general surgery activity between 2005 and 2015 Overall general surgery activity has risen by 17.7%. This shift is most likely due to:

- The gradual increase in elderly acute admissions as the elderly population has grown has led to increase emergency general surgical procedures
- a change of practice, a key change being the move to undertaking more 'hot' or 'acute' gall bladder operations , where previously patients would have been discharged home and brought back in to hospital as an elective patient.

In addition to the increasing emergency pressures, elective pressures have also grown. Over the last 5 years within colorectal surgery there has been a move towards laprascopic surgery as opposed to undertaking 'open' procedures. Where once there would be four major colorectal procedures undertaken on an all day theatre list there are now 2 major cases and 1 or 2 minor cases undertaken.
Overall, the pressures within general surgery are likely to continue to gradually increase in the future as the population gets older.

There is a need to consider how elective general surgery activity can be maintained to ensure access to elective care can be delivered within both the appropriate clinical timescale and within the 12 week TTG.

Figure 65: General Surgery Emergency and Elective Activity 2006 to 2015.

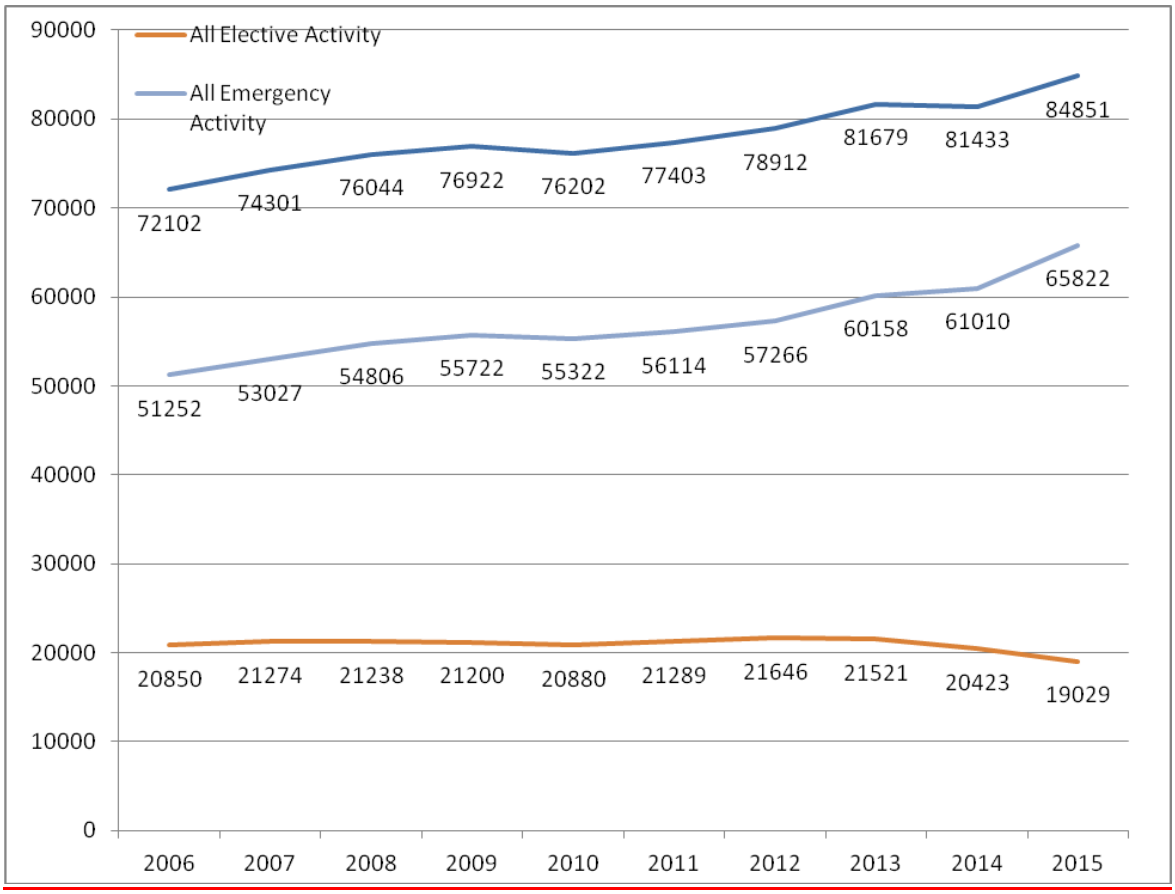


Figure 66 applies forecast population change alone to general surgery and urology activity data . In addition the chart illustrates a snap shot as at January each year of the number of patients waiting longer than 12 weeks for their treatment. Although elective activity fell between 2012 and 2015, Figure 66 illustrates that overall activity increased as a result of the shift from elective to emergency care.

The demand modelling undertaken as illustrated in Figure 66 and Figure 67, predicts that demand for elective urology and general surgery procedures will rise by approx 8.5% between now and 2035. This is an increase of approx 2,580 procedures – (moving from 30,301 procedures in 2015 to 32, 881 procedures in 2035).

Figure 66: Actual and Forecast Elective Urology and General surgery Activity - impact of population change only and TTG breaches

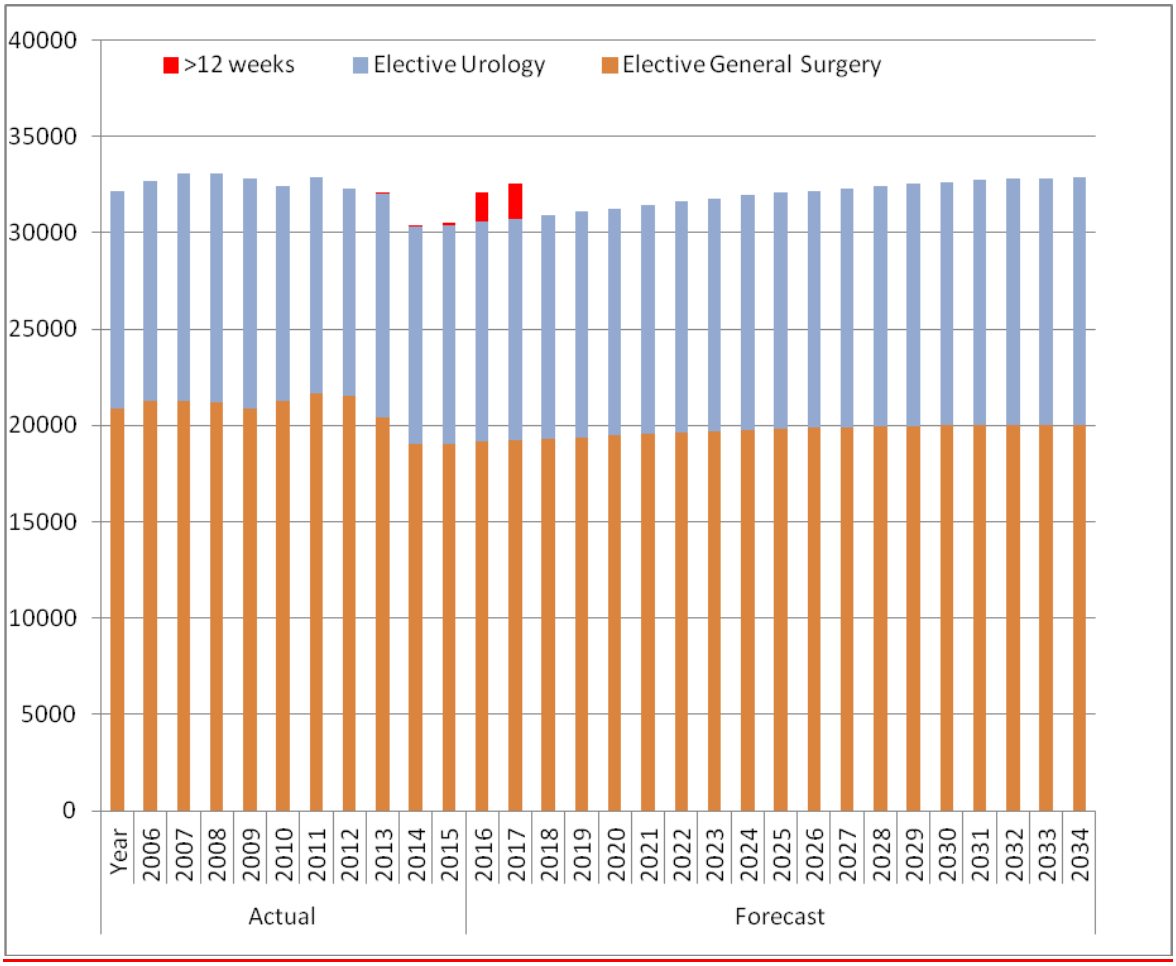
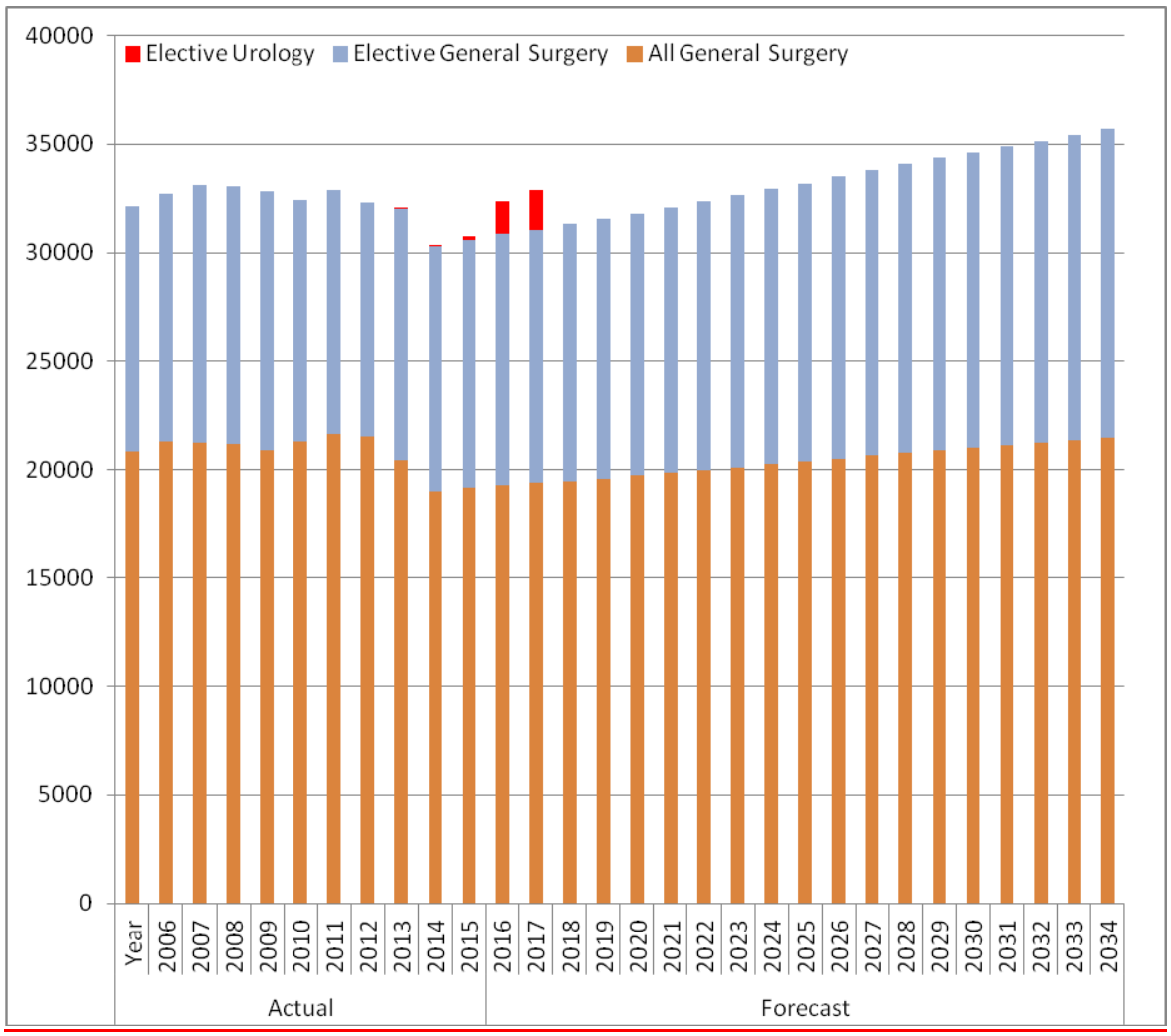


Figure 67 shows the impact of minimal change in rates of intervention applied to the population forecasts as follows:

- 0.5% increase All General Surgery
- 1% increase All Urology

Under this scenario the forecast number of procedures is predicted to rise by 5,365 additional procedures or a 17.70% increase in activity by 2035. As well as forecast demographic change – the move towards creating a small number of major trauma centres, and increasing sub specialisation is likely to further drive the need for capacity for elective general surgery and endoscopy.

Figure 67: Actual and Forecast Elective Urology and General surgery Activity - impact of population change plus a 0.5% increase in general surgery intervention rates & a 1% increase in urology intervention rates Plus TTG breaches



The above demand modelling was reviewed by the WoS Engagement group, the need for protected elective capacity for day case and 23 hour stay within general surgery is evident from both the demand modelling and the day to day pressures seen within the WoS. At this early IA stage, the West of Scotland Engagement Group agreed that the IA planning should assume provision of a flexible facility providing 2 additional inpatient / day case general theatres, it is most likely that these theatres will be used for day case or <23 hour stay general surgery procedures, but further work will be undertaken at OBC stage to ensure the appropriate fit with the needs of the West regional delivery plan.

The current GJF endoscopy and general surgery service is provided by a group of visiting consultant general surgeons, through the development of the additional elective capacity there is an opportunity to revisit the current arrangements. The expansion of general surgery activity and endoscopy would support the ability to review the current arrangements and potentially partner with other local Health Boards to

create more attractive job plans and build a more sustainable efficient medical workforce. In addition if there was an increased presence of general surgical cover on the GJF site there are also opportunities to look at extended nursing roles to support the delivery of the service – particularly within the endoscopy service.

4.1.7 Summary of Predicted Elective Requirements for the West Region

Not all of the forecast additional elective activity required to support the West region population will be provided through the expansion of the GJF. It has been assumed that:

- WoS Health Boards will manage the current waiting time backlog position – no allowance has been made to support the current (Jan 2018) waiting time backlog position within Orthopaedics, General surgery or endoscopy.
- A 10% improvement in clinical productivity will be delivered within orthopaedics in the existing WoS Hospitals, this will be achieved through existing orthopaedic improvement programmes, (e.g. through increasing theatre utilisation, reducing length of stay etc).
- The forecast additional urology activity will be provided through the implementation of the regionalisation of the urology service within the West . Significant work has already been undertaken within the regional planning forum to move towards a regionalised urology service.
- The forecast additional therapeutic endoscopy activity will be provided locally through the expansion of existing local endoscopy services.

The GJF will be expanded to support a significant increase in orthopaedic services and expansion of both general surgery and endoscopy services, delivering the following additional activity for the West region population:

- Orthopaedic Surgery – approximately 6,770 procedures and Approx 10,314 additional new outpatient consultations and circa 5,500 additional pre operative asessment appointments– (assuming average of 50% conversion).
    - 2,211 Primary Knee Replacements
    - 1530 Primary Hip Replacements
    - 405 Revision Arthroplasty Procedures
    - 980 Foot and Ankle Procedures
    - 1644 Hand and Wrist Procedures
- Approx 2,000 additional General Surgery day case procedures and 4,000 new Outpatients with provision for circa 2,000 pre operative assessments at the GJF
- Approx 7,600—Upper GI Diagnostic Endoscopies
- Approx 2,500 – Lower GI Diagnostic Endoscopies

The options section (section 5.3) of this IA sets out the long list of options as to how this forecast additional demand for activity might be delivered at the GJF.

4.2 Impact of doing nothing

Impact on timeliness of access - If there was no change to provision of orthopaedic surgery, General Surgery or Endoscopy, the WoS Health Boards would continue to face increasing demand for surgery. At present there is increasing service pressure as a result of increasing demand which has meant that the Treatment Time Guarantee cannot be met for all patients. There are also significant and growing pressures that have meant that there are now significant numbers of patients within the WoS waiting over 12 or even 16 weeks for a new outpatient appointment (see section 4.1.2).

Financial Impact - In the short term (subject to financial resources being made available) there may be some additional use of the more high cost private sector capacity – however this is not affordable or sustainable for Health Boards. If the private sector capacity was not or could not be accessed, year on year as demand rises, a much larger proportion of patients will wait significantly longer to be seen and assessed as an outpatient and their surgery wait will be significantly longer than it is currently.

Impact for Patients - day to day life - The impact for patients of further delays in accessing surgery is enormous. A significant proportion of patients waiting for surgery are still of working age and there is therefore a wider economic impact when patients are unable to continue to work.

In particular Primary Hip and Knee replacements are cost effective, life changing procedures that significantly improves a person's quality of life, enabling patients to lead an active life and remain working.

4.3 Stakeholder Feedback

Significant patient feedback has been sought for the orthopaedic service. Two patient studies have been completed to understand the impact of using video conferencing for new outpatient consultations. In addition a patient survey has been undertaken to seek general patient feedback about the service currently provided.

As part of the feedback process patients were asked if they would be willing to be involved in shaping the future expansion of services at the GJF, the response has been overwhelmingly positive with lots of patients volunteering to get involved in the expansion project.

4.3.1 Telemedicine Patient Studies

Following the introduction of Video Conferencing clinics within orthopaedics, two studies were undertaken to seek patient feedback. The results of the studies are outlined in Figure 68.

Figure 68: Telemedicine in Orthopaedics – Outcome of Recent Patient Studies

Study one (Prospective pilot study of 51 new patients):
Were you satisfied with today's assessment? *100% (*"Interesting method for consultation"; "Video Link is a good idea and could save a long journey") - *51 patients* *Did it meet your needs as a patient?* *100% (*"It was just like having the consultant in the room"*) - 51 patients* *Was there anything that could have been done differently?* *46/51 no; 5/51 yes (* "a little strange, but can see the benefits"; "camera position and the mobility of the camera, as it was unable to rotate which made the physical assessment awkward at times.")
Study two (A retrospective analysis over a twelve month period - 109 patients in total, feedback collected from 50 at random):
Were you satisfied with today's assessment? *100% - 50 patients* *Did it meet your needs as a patient?* *100% (*"useful, as the cost of travel to the GJH from Shetland is high"; "useful to have a physiotherapist in the room"*) - 50 patients* *Was there anything that could have been done differently?* *48/50 no; 2/50 yes* ("let the patient know beforehand that it is a VC rather than a face to face consultation"; "improve the internet connection")

4.3.2 Orthopaedic Patient Questionnaire

The orthopaedic service is in the process of completing a much wider far reaching patient feedback questionnaire, to date there has been a 61% response rate with 367/600 patients feeding back their views on the service provided. **The feedback has been overwhelmingly positive - with 97% of patients agreeing or strongly agreeing that they would recommend the service to their friends and family and 97% agreeing or strongly agreeing it was worth travelling to the Golden Jubilee for their treatment.**

Responses were received from patients from fourteen different health boards as follows:

Ayrshire & Arran	**12.35%**
Dumfries & Galloway	**5.45%**
Fife	**2.72%**
Forth Valley	**15.80%**
Grampian	**3.00%**
Greater Glasgow & Clyde	**9.26%**
Highland	**1.91%**
Lanarkshire	**11.44%**
Lothian	**25.07%**
Orkney	**0.54%**
Scottish Borders	**1.91%**
Shetland	**3.27%**
Tayside	**5.72%**
Western Isles	**0.27%**
Health Board not indicated	**1.09%**

A summary of the feedback is provided in Figure 69.

Figure 69: Summary of Orthopaedic Patient Feedback

Question Posed	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not indicated
Q1. I was given enough time to discuss treatment options with the surgeon during my out patient appointment	0.27%	0.27%	1.36%	25.34%	71.93%	0.82%
	1	1	5	93	264	3
Q2. I was given sufficient time to ask questions during my outpatient appointment		0.54%	0.82%	25.61%	72.75%	0.27%
		2	3	94	267	1
Q3. I was satisfied I was given appropriate information before my surgery		0.82%	1.36%	23.43%	74.11%	0.27%
		3	5	86	272	1
Q4. The staff were pleasant and helpful	0.27%	0.27%	0.27%	13.35%	85.83%	
	1	1	1	49	315	
Q5. It was worth travelling to the Golden Jubilee National Hospital in order to be treated quickly	0.54%	0.82%	1.63%	11.72%	85.29	
	2	3	6	43	313	
Q6. I would recommend the service to my family and friends	0.27%	0.27%	2.18%	11.99%	84.74%	0.54%
	1	1	8	44	311	2

4.3.3 Stakeholder Workshop and Engagement

As part of the Initial Agreement process for our phase two expansion (orthopaedics, General surgery and endoscopy), we held two stakeholder events to receive feedback on our document and early plans for expansion.

Those participating were a mix of patients who had experienced orthopaedic surgery at the Golden Jubilee, volunteers, third sector representatives and a broad range of staff who currently work in orthopaedics, general surgery and endoscopy. The Scottish Health Council was in attendance at both events. A total of 33 people took part and the full participant list is available in appendix A5.

All participants received the full initial agreement document before the event. The event presentation highlighted the key areas that we wanted feedback and comment on. Questions asked were:

- Are the challenges we face in future for Orthopaedic Surgery, General Surgery and Endoscopy clearly described within our initial document?
- What works well in our current service?
- What does not work so well?
- Views on our proposed solution within the initial agreement

Figure 70: Summary of stakeholder feedback on draft IA

Question: Are the challenges we face in future for Orthopaedic Surgery, General Surgery and Endoscopy clearly described within our Initial Agreement document?

What stakeholders told us...

The stakeholder group felt the future challenges were well described within the IA, particularly the changing demographics of the population and the current and growing waiting times pressures and all supported the objective of reducing / eliminating private sector capacity.

Key points raised included:

- the concern that the facility may not be big enough given the current waiting time backlog isn't included within the forecast demand, they felt this would mean some patients would continue to wait longer for their procedure or surgery if additional capacity isn't provided to meet the current waiting time backlog as well as the forecast increase in demand
- In addition stakeholders feedback that as the business case process evolves, they would be keen to be involved in identifying the differing needs and accommodation / service requirements of patients with a longer length of stay – e.g. the forecast increase in revision arthroplasty patients.
- Stakeholders also highlighted the need for sufficient and well planned admission and recovery space for day case patients to ensure patient privacy and dignity is maintained at all times.
- Ensuring sufficient resources to train staff ahead of expansion was highlighted as key to the success of the proposal

Question: What works well in our current service? **What stakeholders told us...** Stakeholders felt the elective services provided at the GJF were well organised, 'slick' and had very low on the day cancellation rates Catering, cleanliness of the hospital and very low infection rates were also noted by the stakeholders Short length of stay for patients and the enhanced recovery programmes were both highlighted as areas of good practice
Question: What in our current service does not work so well? **What stakeholders told us...** Some of the stakeholders felt there was a long wait for theatre especially if you are admitted in the morning fasting and have surgery in the afternoon Cancellations in general surgery were highlighted by stakeholders as something that could be improved Length of time taken to pre operatively assess patients was highlighted as something that could be improved upon, a review of the pre operative information was suggested as was a suggestion that more pre operative assessment could be undertaken by telephone or using other technologies.
Question: what are your views on our proposed solution within the initial agreement? **What stakeholders told us...** Stakeholders were very supportive of the proposal to expand orthopaedic general surgery and endoscopy capacity to improve access to treatment for patients living within the WoS region Stakeholders highlighted the need to ensure travel planning and access to both improved public transport and additional car parking were considered within the planning of the expanded facilities. Stakeholders felt the use of video conferencing technology was advantageous for patients and where possible / feasible the use of this should be considered further as part of the further development of the model of care for orthopaedics and general surgery.

4.4 What opportunities for improvement are there?

Introduction of an Electronic Patient Record

The GJF are committed to develop an EPR and becoming paper lite, there are many advantages of EPR, improving legibility, ensuring standardisation of processes and improving audit processes.

Electronic Prescribing

GJF are in the process of developing a business case for electronic prescribing. Patient safety can be improved through e-prescribing by increasing prescription legibility, decreasing the time required to prescribe medications and dispense them to patients, and decreasing medication errors and adverse drug events.

Voice recognition

The use of voice recognition technology has been implemented successfully within radiology, and more recently has been piloted within the arthroplasty practitioner service. It is anticipated that the rollout of this technology into other services during the next 12 months will deliver productivity efficiencies.

Theatre- Surgical First Assistants – as part of the workforce modelling a review of the current arrangement for surgical first assistants will be completed, given the current shortages we will be looking at innovative ways to support this gap.

Specific General Surgery and Endoscopy Improvements

- **Theatre utilisation-** Theatre utilisation remains low when compared to the other clinical specialties at the GJF.

- **Further reduction in on the day cancellation rates -** cancellation rates remain relatively high, work is ongoing to review existing processes, consideration is being given to the provision of on site outpatient and pre operative assessment clinics, in tandem a review of the current consultant medical workforce arrangements is underway, there is a need to work with the other WoS Health Boards to create attractive and flexible joint job plans.

Specific Orthopaedic Improvements

- **Use of Robotics -** the impact of robotics within knee surgery is not yet fully understood, the surgical divisional management team are scoping a proposal to introduce a robot to improve the patient experience, improve surgical accuracy and potentially reduce length of stay. Use of robotic technology may also ultimately reduce revision rates, a further improvement for patients and reduce costs.
- **Day of Surgery Admission –** the day of surgery admission rate over that last 5 months is approx 63%, work continues to increase the DoSA rate to over 75% this will be reviewed as part of the OBC model of care
- **Patient level costing exercises -** the GJF finance team are working with the surgical divisional management team to develop and implement patient level costing work to support planning quality improvement and service efficiency.

- **Further reduction in on the day cancellation rates -** cancellation rates remain relatively low at under 4% - it is hoped that this can be reduced further to less than 2%.
- **Further reduction in Length of Stay –** over the last 10 years with the introduction of enhanced recovery LOS has reduced significantly. At IA stage detailed modelling of length of stay has not yet completed, a high level assumption of a small percentage of incremental improvement has been assumed year on year. This would mean under option 3, there is a requirement for approximately 50 orthopaedic inpatient beds. More detailed modelling and research on likely length of stay trends over the next 17 years will be completed at OBC stage to fully inform the bed requirements.
- **Improvement to post operative follow up processes-** all GJF routine post operative follow up is carried out by arthroplasty practitioners, either face to face or via video conferencing, with all patients seen at either 12 weeks (Hips) or 6 weeks (Knee), 1 year, 7 year and 10 years. At present we are aware of two consultants within NHS Scotland who have ceased all post operative follow up. GJF are currently exploring the options to consider how post operative follow up should be provided in the future, both in terms of process and frequency for follow up.
- **Use of Video conferencing for new and review patients -** the roll out of VC for all NHS Shetland new outpatients has been extremely successful (see section 4.3.1). This is also currently being piloted with Highland and Western Isles. As part of the OBC consideration will be given to rolling this out to other distant health boards.
- **Occupational Therapy**– a review of the scope of the band 3 OT assistant role has been successfully piloted within orthopaedic pre assessment and will be further reviewed as part of the workforce plan within the OBC.
- **Patient videos** – significant work has already been completed to provide on line patient videos. In the coming months the Joint School will be filmed and new bite sized film clips developed to support patients exercise post joint replacement.
- **Extended Scope Practitioner roles –** we currently have one ESP practitioner within orthopaedics, a further piece of work will be undertaken to review the role of ESPs as we continue to expand.

4.5 What are the problems with the current arrangements?

Year on year the GJH has increased capacity to support Boards in the delivery of waiting time guarantees. However, for the past year, theatres at the GJH have been operating at full capacity and GJH is no longer in a position to offer any further support or meet the demands of referring Boards. The existing capacity within the WoS Heath Boards and the GJH will be unable to cope with the predicted further increase in demand for orthopaedic surgery, general Surgery and Endoscopy as set out in section 4.1.6.

Current waiting time targets cannot currently be met without significant use of the private sector and high cost waiting list initiative sessions. With no definite plans in place to deliver additional capacity, pressure continues to grow and there are a number of issues facing the service across Scotland including:

- Growing demand and challenges in terms of capacity to meet the demand, partly as a result of the significant increase in the elderly population
- Delivery of waiting times
- Maintaining quality standards and providing high quality services
- Technology changing what is possible in terms of treatment
- Workforce challenges to support the current and future service requirement

In the past the GJH has supported the delivery of waiting time targets by creating additional capacity through service expansion, the hospital is now operating at full capacity.

4.6 What other drivers for change are there?

Addressing the existing facility constraints

Over the period 2003/4 – 2017/18 the number of orthopaedic procedures carried out at GJNH has increased by 340%. However our current facilities are now working at maximised capacity.

Addressing the current workforce pressures

Every NHS Board in Scotland has workforce pressures within their theatre nursing workforce, as part of this proposal the existing GJF theatre training academy will be enhanced and enlarged to support the training of newly qualified nurses to avoid the GJF trying to recruit from the same pool of experienced theatre nurses.

4.7 Summarising the need for change

A full list of the main drivers for change is outlined below. The table below also describes the cause and effect of the need for change and investment.

Figure 71: Summarising the need for change and investment

What is the cause of the need for change?	What effect is it having, or likely to have, on the organisation?	Why action now:
Significant increase in the current and predicted future service demand - Existing capacity within in the WoS is unable to cope with future projections of demand for orthopaedic surgery, General Surgery and Endoscopy between now and 2035	Existing capacity is unable to cope with current activity and will be unable to cope with the significant future projections of demand	The service will not be able to sustain the current position – if the plan to provide additional capacity isn't implemented now patients will face a much longer wait for surgery and waiting time guarantees will not be met for majority of patients
The current clinic and theatre accommodation is fully utilised at GJF – there is now further ability to expand surgical services	Until 2017 the GJF was able to support NHS Scotland by increasing surgical capacity year on year – this is no longer an option and patients are having to wait much longer for their elective surgical treatment.	Expansion of the existing facilities at the GJF will enable the existing highly efficient and effective services to be expanded year on year to meet the growing needs of the WoS population

4.8 What is the organisation seeking to achieve?

4.8.1 Investment Objectives

Figure 72 provides a summary of the investment objectives associated with this proposal

Figure 72: Investment Objectives

	Effect of the need for change on the organisation:	What has to be achieved to deliver the necessary change? (Investment Objectives)
Capacity Related Objectives	Existing capacity within in the WoS is unable to cope with future projections of demand for orthopaedic surgery between now and 2035.	1. There is a requirement to improve current service capacity to meet the significantly increased predicted demand between now and 2035
	More patients treated in the high cost private sector - existing capacity pressures mean NHS Board have to access high cost surgery within the private sector	2. Improve capacity to facilitate the reduction or elimination of routine use of the private sector
	More patients do not access services within the current waiting time guarantees - existing capacity pressures mean that often NHS Boards are unable to meet Scottish Government waiting time guarantees	3. Improve capacity and performance to ensure the delivery of current and future Scottish Government guarantees for inpatient / day case waiting times on a sustainable basis
	Sometimes elective surgery is cancelled as a result of existing service and or capacity pressures	4. Provide sufficient dedicated elective capacity to reduce the likelihood of cancelling patients
Quality and Performance Related Objectives	Service performance is variable - there is a need to improve existing service performance and improve current efficiency and productivity by providing more innovative models of care and adopting the principles of Better Care, Better Health and Better Value as set out in the Scottish Government "Health	5. Reduce variability and introduce innovative models of care – to improve overall service performance within orthopaedic surgery. This will deliver increased service efficiency and productivity

	and Social Care Delivery Plan" published in December 2016	
	Existing facilities are functionally ineffective and are unable to support more innovative models of care and efficient patient flow	6. A new improved environment and facility will be integral to supporting the more innovative models of care and also essential to support improved clinical productivity
	The GJF service model and patient pathways have been redesigned and are evolving , however the service could be more person centred and delivered in a more innovative and sustainable way. GJF is aspiring to be 'best in class' and provide 'world class model of care' for patients whilst also supporting the recruitment, retention and well being of staff - supporting and encouraging staff development	7. To implement new, innovative models of care is a state of the art environment adopting best practice principles (nationally and internationally) 8. To develop a workforce model that supports recruitment retention and supports staff wellbeing and development whilst also ensuring the workforce model is efficient and sustainable

4.8.2 What are the benefits and risks to success?

Within GJF we are currently developing our Enterprise Risk Management approach. As outlined in the Boards Risk Appetite Statement:

"The acceptance of any risk is subject to ensuring the impact in benefits and risks of any decision are understood and managed through appropriate measures to mitigate risk. The Board recognises that any appetite for risk will vary according to the issue and therefore different appetites and tolerances to risks will apply".

Generally the Boards appetite for risk is greater in areas of innovation where this can lead to positive gains such as the innovative design and service model. As noted this is with appropriate mitigation measures in place and a clear understanding of the benefits with supporting plans to realise and measure these.

4.8.3 What benefits are gained from this proposal?

At this stage only the key benefits of this proposal are outlined in the table below. Indicative targets have been identified in order that the benefits can be measured as the business case process progresses. The benefits register will be reviewed and a benefits realisation plan will be developed during the OBC stage as the project progresses.

Figure 73: Benefits Register

Benefits Register						
1. Identification						Prioritisation- RAG
Ref No	Benefit	Assessment	As Measured By:	Baseline Value	Indicative Target Value	
1	Person centred - nests	Ensure that people who use the service have positive experiences and their dignity is respected	Patient feedback through patient survey – percentage of patients who rate the service and excellent or good	See Section 4 for a full summary of the patient feedback received to date	Patient questionnaire is ongoing - maintain current very positive patient feedback scores	5
			Patient feedback	In 2017 there were 9 written compliments, 2 informal concerns raised, and 31 formal complaints. Combining concerns raised and formal complaints they accounted for less than 0.30% of patients seen by the service	Maintain current very low levels of complaints/ concerns	5
2	LDP	Improving access to orthopaedic surgery, general surgery and endoscopy - Ensure that people who require to access the service can do so in a timely manner	Proportion of patients who are seen and treated within 12 weeks of being placed on a waiting list for surgery	As at Jan 2018 there were 10,413 patients WoS patients waiting over 12 weeks for an orthopaedic, general surgery procedure or an endoscopy (>6weeks)	Zero patients waiting more than 12 weeks for Orthopaedic surgery, General surgery or endoscopy	**5**
			Reduction in elective cancellations	Cancellations vary by specialty orthopaedic cancelation rate is approx 4% whilst general surgery rate is between 7 and 15%	Reduce Elective cancellations to under 25 for orthopaedic surgery and under 5% for general surgery	**5**
4	Project Specific	Reduces reliance on high cost private sector elective	A reduction in the number of procedures performed in the private	901 procedures (WoS Boards only) were performed in private	100% reduction saving circa £4.2m per annum (based	**5**

Benefits Register						
1. Identification						Prioritisation- RAG
Ref No	Benefit	Assessment	As Measured By:	Baseline Value	Indicative Target Value	
		surgical capacity	sector	sector in 2014/15	on 2014/15 spend	
5	Project Specific	Improvement in clinical productivity within orthopaedics	Minimum of 10% productivity gain in both clinic and theatres – across all WoS hospitals	Deliver more procedures within existing resources, baseline figure in 2015 is circa 26,000 orthopaedic procedures per annum	Deliver a minimum of 10% increase in productivity in Orthopaedic services within WoS Hospitals within existing resources – circa 2,600 additional procedures per annum	**5**
6	Project specific	Improvement in recruitment retention of staff and availability of staff with the right skills and competencies	Improved ability to recruit and retain the hard to fill positions e.g. theatre nursing posts	As the service expands monitor the ability to recruit roles and monitor the success of the GJF Theatre training academy approach, thereby training own theatre staff as the service expands Monitor the retention rates of staff – orthopaedic ward nursing retention rates ranger between 7 and 15% turnover within our Orthopaedic ward areas	Measure the success of the theatre training academy – aiming for 100% success rate i.e. trainee secures post at the end of training within the GJF theatres. Lower existing turnover rates to under 7%	**5**
		Improvement in staff wellbeing and engagement	Measure through annual imatter survey response	2016 employee engagement score for the Orthopaedics theatre team was 76% the EES for the	Either maintain or improve employee engagement scores	**5**

Benefits Register						
1. Identification						Prioritisation- RAG
Ref No	Benefit	Assessment	As Measured By:	Baseline Value	Indicative Target Value	
				orthopaedic outpatient team was 83% Within General theatre nursing team 100%, SDU nursing team 100%ortho Physio team 82%, PACU nursing team 46%		
7	Project Specific	Delivery of wider Economic Benefits - Community Benefits e.g. New Entrants, Apprenticeships, SME and 3rd Sector benefits (see appendix A9)	Measure using the community benefits plan (see appendix A9)	Community benefits will be generated and delivery monitored when the PSCP is selected and commences work	Targets are set out in the agreed community benefits plan (see appendix A9)	5

4.8.4 What Risks could undermine the proposals success?

At this stage we have undertaken an initial risk assessment via the Project Team and in consultation with key internal stakeholders. In line with the recommendations we have considered the risks at a high level and acknowledge that the detail of these will develop as the process progresses.

We have included an IA Stage Risk register which presents the risks considered at this stage. The risk register presents the risk score which is based on having no mitigation in place though in some cases controls are already in place and this has been noted. It must be noted that given the current stage much of the mitigation included is what has been confirmed within plans; not all of it is yet in operation. In line with our standard approach there are 6 clusters across which the potential impact is assessed; this is a prompt to ensure all aspects are considered. A risk is also assigned an overall cluster from the 6.

Currently there are 19 identified risks on the IA Stage register, the HEAT map below provides an overview of the distribution of the risk ratings:

Figure 74: Risk Register HEAT Map

Likelihood	Consequence/ Impact				
	1	2	3	4	5
5					
4	**(3) (10)**	**(19)**	**(7) (11) (12)**	**(15) (1)**	
3	**(14)**	**(17)**	**(4) (6) (9) (18)**	**(8)**	
2		**(2)**	**(13) (16)**		
1			**(5)**		

As shown above there are 5 high risks identified:

- The project disrupts the day to day business operations
- Critical programme dates are unrealistic
- The need for clinical change and expected outcomes isn't clearly defined – relates to change within GJH and expectations across the region.
- The design fails to meet the design assessment expectations
- The project becomes unaffordable

Further work will be undertaken in reassessing the risk ratings and agreeing targets and tolerances for all risks on the register.

4.8.5 Are there any constraints or dependencies?

Constraints

A specific constraint unique to the GJF site is the co-location of the Scottish National Advanced Heart Failure Service (SNAHFS), patients within this group include patients who are awaiting or have undergone heart transplantation and are particularly vulnerable as they are immunocompromised. As the only centre undertaking Heart transplantation within Scotland it is essential the service is safeguarded during site investigations, ground works or periods of construction.

Numerous fungal outbreaks have occurred in healthcare settings and have been a serious threat to immunocompromised patients. Construction and renovation activities can cause serious dust contamination and disperse fungal spores and construction activity has been reported as an independent risk factor for invasive fungal infection. In published reports invasive aspergillosis has an overall case fatality rate of 58%.

To mitigate the risk to this patient group and other immunocompromised patients within the GJF, the HAI SCRIBE process is integral to the design and construction elements of the expansion. During the construction phase, agreement, application and compliance monitoring of robust control measures is essential. To date when the site investigations were carried out patients were advised to access the hospital from the hotel entrance and avoid using the main hospital entrance which is adjacent to the development site for project1 of the hospital expansion.

In addition to the construction of the new facility, to ensure connectivity with the existing theatre suite the phase 2 expansion will involve breaking through into the main theatre suite on level 3. This will involve losing an existing theatre, therefore there is a requirement to build one additional theatre over and above the total number required to replace the one lost as a result of the building works. Works will therefore have to be very carefully planned and considered during construction of the facility and during break through into the existing building into a live outpatient environment. This work will be carried out by the PSCP but will involve input from the GJF clinical teams including the lead infection control nurse, lead consultant microbiologist, Orthopaedic and SNAHFS medical teams

Dependencies

In addition to the provision of additional new build capacity the delivery of sufficient capacity is dependent on a minimum 10% improvement in clinical productivity in all hospitals currently undertaking orthopaedic surgery within the WoS.

5 What is the preferred strategic / service solution?

	Question	Response
Economic Case	**What is the preferred strategic / service solution?**	**Confirm:** • The Do Nothing option • Service change proposals • Indicative costs • Assessment of proposed solutions • Preferred strategic / service solution(s) • Design Quality objectives

5.1 The Do Nothing Option

The overall impact of doing nothing is outlined in section 4.2, Figure 75 provides a summary of the do nothing option.

Figure 75: Summary of the 'Do Nothing' Option

Strategic Scope of Option:	Do Nothing
Service provision:	The do nothing options does not meet the immediate imperative for additional service capacity nor does it avoid the imminent adverse impacts on the service as a result of lack of service provision. Waiting time pressures are continually rising within orthopaedics, general surgery and endoscopy, without investment in additional elective capacity the number of patient waiting longer than 12 weeks (or 6 weeks for endoscopy) will continue to rise.
Service arrangements:	As outlined in section 4.1.3 and 4.1.6 there is significant additional predicted demand for Orthopaedic surgery, General surgery and endoscopy in the next 18 years. **Within the WoS:** • the number of people aged 60 plus is predicted to increase by 34.8%, an increase of 218,670 people aged over 60 by 2035 • the number of people aged 70 plus is predicted to increase by 56%, an increase of 183,959 people aged over 70 by

	2035 Further modelling has identified that as a result of increased demand, in the WoS there will be a requirement for significant additional theatre capacity (estimated at approximately 8,770 additional surgical procedures, approx 10,100 diagnostic endoscopies, 14,314 new outpatient appointments and 7,500 pre operative assessment appointments).
Service provider and workforce arrangements:	There are growing waiting time pressures within the WoS, in Jan 2018 there were over 10,413 patients waiting over 12 weeks (6 weeks in the case of endoscopy) for an orthopaedic/ general surgery / endoscopy procedure and in all specialties there were 16,377 patients waiting over 12 weeks to be seen in a new orthopaedic or general surgery outpatient clinic. In addition, during 2015/2015 there was increased usage of high cost private sector capacity for orthopaedics, general surgery and endoscopy - with over 5,000 procedures carried out in the private sector at a cost of £19.2m (of which 941 patients were referred by WoS Health Boards to the private sector, at an estimated cost of £4.2m). Overall doing nothing will result in increasing financial pressures due to the need to access more high cost private sector and also the opportunity cost of not being able to implement innovative 'best in class' / 'world class' service model that delivers improved productivity and efficiency.
Supporting assets:	The current accommodation has been creatively used to support all redesign and improvements in patient flow to date. However in order to support the delivery of additional orthopaedic / general surgery and endoscopy activity and ensure the continued delivery of efficient and effective services there is a requirement to expand the facilities.
Public & service user expectations:	If no action is taken, there will be a huge shortfall in capacity which will have an enormous impact for patients. Year on year as demand rises, a much larger proportion of patients will wait significantly longer to be seen and assessed as an outpatient and also once on a waiting list for surgery their wait will be significantly longer than it is currently. In particular THR and TKR surgery are cost effective, life changing

	procedures that significantly improves a persons quality of life, enabling patients to lead an active life and remain working contributing to the economy.

5.2 Engagement with Stakeholders

In developing this IA, there was early engagement with the Scottish Health Council. Following advice from Scottish Government and after discussion with SHC, as this proposal is about delivering an expansion of an existing service over a number of years, proportionate engagement was considered appropriate to capture patients', carers' and the public's views and experiences

Figure 76: Summary of Engagement with Stakeholders

Stakeholder Group:	Engagement that has taken place	Confirmed support for the proposal
Patients / service users	Patients and service users affected by this proposal include patients from each WoS Health Boards. Their involvement in its development includes: • Providing feedback on our current service model via a patient questionnaire – this is ongoing • Participating in two design statement workshops and feeding back on the 2 Design statement drafts • Involvement in the AEDET assessment - specifically the Use, Access and Patient and Staff Environment factors – these were assessed during the 3rd May workshop • Orthopaedic and general surgery patients participated in a stakeholder workshop to provide feedback on the draft IA, the stakeholders were very	Section 4.3 of this IA outlines the hugely positive feedback we have received to date from patients – in summary 97% of patients agreed or strongly agreed that they would recommend the service to their friends and family, and 97% agreed or strongly agreed it was worth travelling to the Golden Jubilee for their treatment. Patient representatives have been involved in the Development of the design statement, the Initial agreement stakeholder workshop, Those who participated in the design statement workshops feedback that they found the event useful and were supportive of the proposals for expansion. Many wish to continue to be involved in the project going forwards. Patient / service user groups were consulted on the final version of this Initial Agreement at a

	supportive of the proposal figure 70 for the specific feedback	stakeholder workshop on 26th April 2018 At this Initial Agreement stage, attendees were supportive of the proposal. The specific feedback is outlined in Figure 70 much of which will help shape and improve our current service provision.
General public	As this proposal involves expanding an existing service there have been no large scale consultation exercises, however there has been significant patient involvement to date which will continue throughout the life of the project.	
Staff / Resources	Staff affected by this proposal include all those staff currently working with our orthopaedic department and staff working in clinical and non clinical support services – a wide range of staff from across the orthopaedic MDT and other non clinical departments participated in a stakeholder workshop to gather their views as to the proposal outline within this IA. In addition a wide range of staff from across the hospital were integral to the development of the design statement and the AEDET workshop.	Staff representatives were consulted on the final version of this Initial Agreement by workshop on 17th April 2018. Their feedback was very supportive of this proposal in particular staff felt the case for change was very clear and thought there were significant benefits to the training academy approach already in place to support the expansion of the existing nursing workforce.
Other key stakeholders and partners	Other key stakeholders identified for this proposal include: Third sector partners (see list of organisations who participated in the IA Stakeholder workshop are set out in (appendix A5) . WoS Health Boards – 7 West of Scotland Engagement meetings	Confirmed support for this proposal has been gained at the stakeholder workshop – feedback from third sector representatives is outlined in Figure 70 of this IA. Formal Regional support was sought via the West of Scotland Directors of Finance, West of

	have been held between Jan 2017 and November 2017, in addition individual meetings were held in March and April 2018 with the nominated director level leads of each WoS Health Board. All were comfortable with the proposed modelling assumptions and were supportive of the creation of additional elective capacity for orthopaedics, general surgery and endoscopy.	Scotland Health and Social Care Delivery Plan Programme Board and through each Health Board's senior planning lead. The IA was presented at the WoS DoFs meeting on 20th April and at the WoS Health and Social Care Delivery Plan Programme Board on 27th April 2018, Following this the IA document was circulated to both groups and the National Board Collaborative Programme Board to seek feedback. A letter of support from the Chief Executive Implementation lead for the West region is contained within Appendix A10.

5.3 Developing a list of proposed solutions

In the development of the options the following has been assumed:

- The WoS Health Boards will continue to improve their orthopaedic services model of care. Through reducing length of stay and increasing theatre utilisation, a minimum of 10% could be delivered within all WoS hospitals that currently providing orthopaedic surgery. This would thereby create additional capacity using existing resources – this would be utilised to address the current and growing waiting time pressures and provide capacity for a further 2,600 procedures per annum
- WoS Health Boards will manage the current waiting time backlog position – no allowance has been made to support current (Jan 2018) waiting time backlog position
- WoS Health Boards will manage the impact of increased demand for therapeutic endoscopy and urology

The above assumptions will be reviewed in conjunction with the WoS Engagement Group as part of the OBC development.

A list of potential solutions were developed as set out in Figure 77.

The demand modelling described in section 4.1.7 describes the requirements to provide a solution that provides additional capacity to meet this demand. Only option references E, F and G (short listed as options 2, 3, and 4) can deliver this additional capacity. All other options deliver either status quo or a small amount of additional capacity. In order to meet treatment time guarantees there would be a need to

rely far more heavily on access to the more high cost private sector. The activity therefore quoted below in each of the options is the additional activity that can delivered within each option.

The options described take into account the impact of the East and North Boards repatriating their activity.

Performance Assumptions:

At this early IA stage the performance assumptions used to identify the facility requirements are based on the current GJF service model (see appendix A1). Further refinement and improvement to the performance assumptions will be discussed and agreed as the model of care is further developed as part of the OBC (see section 4.4 opportunities for improvement).

Figure 77: Phase 2 - Long List of Potential Options

(Note1: In the expansion options – One existing theatre will be lost to enable connection to the existing theatre suite)

Option Ref	Option Description	Activity Delivered	Key Addtional Facilities provided	Option Implications: Repatriation	Shortlist? Y/N
A	Do nothing Retain Status Quo	No additional Capacity provided	No change to existing facilities	No repatriation of existing activity	No
B	Do Minimum: A small amount of additional orthopaedic capacity will be provided through the repatriation of NHS Highland activity	Additional Capacity for: 150 additional procedures per annum (75 major and 75 minor)	No new additional facilities provided	This option is supported by the confirmed repatriation of NHS Highland activity over a 3 year period from 2021/22 onwards at rate of 50 cases per annum	Yes – Baseline Comparator Option 1
C	ISD - Population Growth Minus 5%	Additional Capacity for: 691 THR 525 TKR Plus 56 additional arthroplasty revisions No capacity for other surgical specialties	2 orthopaedic theatres (Note 1: build 3) Day of surgery admissions facility Additional Inpatient Beds (Refurbishment & Commissioning of existing ward within GJF) Additional outpatient and pre operative assessment facilities	This option is supported by the confirmed repatriation of NHS Highland activity over a 3 year period from 2021/22 onwards at rate of 50 cases per annum	No
D	ISD Population Growth *Also meets the* ISD Population Growth Plus 5% Scenario	Additional Capacity for: 891 THR 915 TKR 385 revision arthroplasty's	3 orthopaedic theatres (Note 1: build 4) Day of surgery admissions facility Additional Inpatient Beds (Refurbishment & Commissioning of existing ward within GJF) Additional outpatient and pre operative assessment facilities	This option is supported by the confirmed repatriation of NHS Highland activity over a 3 year period from 2021/22 onwards at rate of 50 cases per annum	No

Option Ref	Option Description	Activity Delivered	Key Additional Facilities provided	Option Implications: Repatriation	Shortlist? Y/N
E	Population growth plus GJF modelled anticipated allowance for increasing intervention rates.	Additional Capacity For: 2,211 TKR 1530 THR 405 revision arthroplasty's 980 F&A 1644 H&W Circa 2,000 additional General Surgery day case procedures Approx 7,600—Upper GI Diagnostic Endoscopies & Approx 2,500 – Lower GI Diagnostic Endoscopies	4 ortho theatres (Note 1: build 5) Endoscopy Suite - 2 additional Endoscopy rooms admission and recovery space (build 3 – need to co-locate existing scope room at GJF) Additional 2 general IPDC theatre - could be use flexibly general surgery/ minor ortho Day of surgery admissions facility Day Case Admission and recovery facility (likely 23 hour stay unit) Additional Inpatient Beds (Refurbishment & Commissioning of existing wards x 2 within GJF) Additional outpatient and pre operative assessment facilities	This option is supported by the confirmed repatriation of NHS Highland activity over a 3 year period from 2021/22 onwards at rate of 50 cases per annum And the potential (not yet formally confirmed) repatriation of the following orthopaedic activity to East and North Health Boards over a 5 year period from 2023/24onwards as follows: NHS Lothian (1,355 new ortho outpatients, 786 joints, 40 Foot and ankle procedures and 77 ortho minor procedures) • NHS Grampian (214 new Ortho outpatients, 100 joints and 50 ortho minor procedures) • NHS Tayside (650 new Ortho outpatients, 75 joints and 260 foot and ankle procedures) NHS Ayrshire and Arran (1,162 new Ortho outpatients, 345 joints, 144 ortho minor procedures and 65 foot and ankle procedures) .	**Yes** **Option 2**

Option Ref	Option Description	Activity Delivered	Key Additional Facilities provided	Option Implications: Repatriation	Shortlist? Y/N
F	Population growth plus GJF modelled anticipated allowance for increasing intervention rates	Additional Capacity For: 2,211 TKR 1530 THR 405 revision arthroplasty's 980 F&A 1644 H&W Circa 2,000 additional Genera Surgery day case procedures Approx 7,600—Upper GI Diagnostic Endoscopies & Approx 2,500 – Lower GI Diagnostic Endoscopies	5 ortho theatres (Note 1: build 6) Endoscopy Suite - 2 additional Endoscopy rooms admission and recovery space (build 3 – need to co-locate existing scope room at GJF) Additional 2 general IPDC theatre - could be use flexibly general surgery/ minor ortho Day of surgery admissions facility Day Case Admission and recovery facility (likely 23 hour stay unit) Additional Inpatient Beds (Refurbishment & Commissioning of existing wards x 2 within GJF) Additional outpatient and pre operative assessment facilities	This option is supported by the confirmed repatriation of NHS Highland activity over a 3 year period from 2021/22 onwards at rate of 50 cases per annum And the potential (not yet formally confirmed) repatriation of the following orthopaedic activity over a 5 year period from 2023/24 onwards : NHS Lothian (1,355 new ortho outpatients, 786 joints, 40 Foot and ankle procedures and 77 ortho minor procedures) NHS Grampian (214 new Ortho outpatients, 100 joints and 50 ortho minor procedures)	**Yes** **Option 3**

Option Ref	Option Description	Activity Delivered	Key Additional Facilities provided	Option Implications: Repatriation	Shortlist? Y/N
G	Population growth plus GJF modelled anticipated allowance for increasing intervention rates - assumes only NHS Highland repatriate orthopaedic activity.	Additional Capacity For: 2,211 TKR 1530 THR 405 revision arthroplasty's 980 F&A 1644 H&W Circa 2,000 additional General Surgery day case procedures Approx 7,600—Upper GI Diagnostic Endoscopies & Approx 2,500 – Lower GI Diagnostic Endoscopies	6 ortho theatres (Note1: build 7) Endoscopy Suite - 2 additional Endoscopy rooms admission and recovery space (build 3 – need to co-locate existing scope room at GJF) Additional 2 general IPDC theatre - could be use flexibly general surgery/ minor ortho Day of surgery admissions facility Day Case Admission and recovery facility (likely 23 hour stay unit) Additional Inpatient Beds (Refurbishment & Commissioning of existing wards x 2 within GJF) Additional outpatient and pre operative assessment facilities	This option is supported by the confirmed repatriation of NHS Highland activity over a 3 year period from 2021/22 onwards at rate of 50 cases per annum	No – May not be feasible to build a facility of this size on the GJF identified site (this would require further testing)

Figure 78: Advantages and Disadvantages of the Short listed Options

Option Ref A	**Advantages**	• This option offers no advantages
	Dis-advantages	• Provides no additional capacity to enable good patient access to timely surgery within waiting time guarantees • Offers a poor patient experience – impact of waiting longer for surgery will have significant impact on quality of life • Will result in increasing waiting time pressures – WoS Health Board will increasingly be unable to meet waiting time target for most patients • Does not reduce likelihood of reliance on private sector capacity (subject to finance being available) • Will result in increasing financial pressures
Option Ref B	**Advantages**	• Offers a very small amount of additional orthopaedic capacity
	Dis-advantages	• Disadvantages of this option are identical to option reference A, in addition: • Offers no additional general surgery or endoscopy capacity
Option Ref C	**Advantages**	• Offers some additional orthopaedic capacity – but not sufficient to meet forecast demand
	Dis-advantages	• Provides some additional capacity to enable good patient access to timely surgery within waiting time guarantees, but likely to be insufficient to deal with demand • Patient experience – some patients will continue to experience the impact of waiting longer for surgery will have significant impact on quality of life • Will still result in increasing waiting time pressures – WoS Health Board will increasingly be unable to meet waiting time target for most patients • Does not significantly reduce likelihood of reliance on private sector capacity (subject to finance being available) • Will result in some increasing financial pressures • Offers no additional general surgery or endoscopy capacity

Option Ref D	**Advantages**	• Offers some additional capacity – but not sufficient to meet forecast demand
	Dis-advantages	• Disadvantages are similar to option C, however impact reduced slightly as there is some increased capacity when compared to option C, but still not sufficient to meet the forecast demand • Offers no additional general surgery or endoscopy capacity
Option Ref E	**Advantages**	• Provides sufficient capacity to meet forecast demand for orthopaedics, general surgery and endoscopy • Patient experience – improves timely access to treatment - no patient will experience the impact of waiting longer for surgery • Will still reduce waiting time pressures – WoS Health Board will be able to meet waiting time targets • eliminates reliance on private sector capacity • Reduces financial pressures • Facilitates significant repatriation of activity to North and East Regions (Lothian, Tayside, Grampian, plus Ayrshire and Arran)
	Dis-advantages	• Likely maximum level of repatriation is included within this option. The timing and impact of repatriation may impact availability of increased capacity for the WoS region patients – careful planning will be required to mitigate this

Option Ref F	**Advantages**	• Provides sufficient capacity to meet forecast demand for orthopaedics, general surgery and endoscopy • Patient experience – improves timely access to treatment - no patient will experience the impact of waiting longer for surgery • Will still reduce waiting time pressures – WoS Health Board will be able to meet waiting time targets • eliminates reliance on private sector capacity • Reduces financial pressures • Facilitates significant repatriation of activity to North and East Regions (Lothian, Tayside, Grampian, plus Ayrshire and Arran) • Repatriation is reduced under this option, this will potentially help smooth the impact of repatriation on the availability of increased capacity for the WoS region patients
	Dis-advantages	• There are no identified disadvantages of this option
Option Ref G	**Advantages**	• Provides sufficient capacity to meet forecast demand for orthopaedics, general surgery and endoscopy • Patient experience – improves timely access to treatment - no patient will experience the impact of waiting longer for surgery • Will still reduce waiting time pressures – WoS Health Board will be able to meet waiting time targets • eliminates reliance on private sector capacity • Reduces financial pressures • Facilitates repatriation of orthopaedic activity to NHS Highland
	Dis-advantages	• Does not facilitate larger scale repatriation of orthopaedic activity to North and East regions • May not be feasible to build a facility of this size on the GJF identified site (this would require further testing)

5.4 Initial Assessment of Proposed Options

An initial assessment of the proposed option is provided in figure 80

Figure 79: Potential Overview of Options

Strategic Scope of Option:	Option 1: Do Minimum	Option 2: Population growth plus GJF modelled anticipated allowance for increasing intervention rates with maximum repatriation (4 Additional Ortho Theatre option)	Option 3: Population growth plus GJF modelled anticipated allowance for increasing intervention rates with some repatriation (5 additional Ortho Theatre Option)
Service provision:	Does not meet immediate imperative for additional capacity	Meets predicted need / demand	Meets predicted need / demand
Service arrangements:	As current arrangements	Offers opportunity for enhanced service model and environment for staff and patients	Offers opportunity for enhanced service model and environment for staff and patients
Service provider and workforce arrangements:	Service pressures will increase significantly, will also impact ability to recruit and retain a highly skilled motivated workforce	Services designed to further improve existing model of care and meet the required patient demand while reducing patient waiting times Enhanced facilities will support recruitment and retention of highly skilled staff	Services designed to further improve existing model of care and meet the required patient demand while reducing patient waiting times Enhanced facilities will support recruitment and retention of highly skilled staff
Supporting assets:	As per current arrangements	New enhanced facilities to further support improvement in model of care and use of technology	New enhanced facilities to further support improvement in model of care and use of technology
Public & service user expectations:	Cannot meet key investment objectives	All key Investment objectives are met Opportunities for innovation and further service improvement can be realised	All key Investment objectives are met Opportunities for innovation and further service improvement can be realised

Figure 80: Initial assessment of proposed solutions

	Option 1: Do Minimum	Option 2: Population growth plus GJF modelled anticipated allowance for increasing intervention rates with maximum repatriation (4 Additional Ortho Theatre option)	Option 3: Population growth plus GJF modelled anticipated allowance for increasing intervention rates with some repatriation (5 additional Ortho Theatre Option)
Main Advantages (Strengths & Opportunities) See Figure 78 for full list	None	Provides sufficient capacity to meet forecast demand for orthopaedics, general surgery and endoscopy Purpose built facility supports further enhanced service model and environment for staff and patients	Provides sufficient capacity to meet forecast demand for orthopaedics, general surgery and endoscopy Purpose built facility supports further enhanced service model and environment for staff and patients
Main Disadvantages (Weaknesses & Threats) See Figure 78 for full list	Offers no additional general surgery or endoscopy capacity	Likely maximum level of repatriation is included within this option. The timing and impact of repatriation may impact availability of increased capacity for the WoS region patients – careful planning will be required to mitigate this	Repatriation is reduced under this option, this will potentially help smooth the impact of repatriation on the availability of increased capacity for the WoS region patients
Investment Objective 1	No	Fully	Fully
Investment Objective 2	Very Partially	Fully	Fully
Investment Objective 3	No	Fully	Fully
Investment Objective 4	No	Fully	Fully
Investment Objective 5	No	Fully	Fully
Investment Objective 6	No	Fully	Fully
Investment Objective 7	No	Fully	Fully
Investment Objective 8	No	Fully	Fully
Affordability	No	Yes	Yes
Preferred / Possible / Rejected	**No**	**Possible/preferred**	**Possible/ Preferred**

The preferred strategic service solutions are options 2 and 3. The identification of a preferred solution will require confirmation of repatriation volumes and timings to the North and East regions. It is anticipated this will be confirmed before this IA is submitted to CIG. The preferred solution will then be taken forward to the Outline Business Case stage where the implementation of the solution(s) shall be further developed and tested for value for money.

5.5 Design Quality Objectives

The programme team and wider stakeholders have had early engagement with Health Facilities Scotland (HFS) and Architectural Design Scotland (ADS), as part of the NHS Scotland Design Assessment Process (NDAP).

Two design statement workshops were held on 20th March and 18th April 2017, facilitated by ADS which enabled the design statement to be developed with a wide range of staff patients and public representatives. Appendix A3 includes the final design statement and incorporates the list of participants. The Design Statement will provide a constant benchmark for agreed design principles throughout the lifetime of the project.

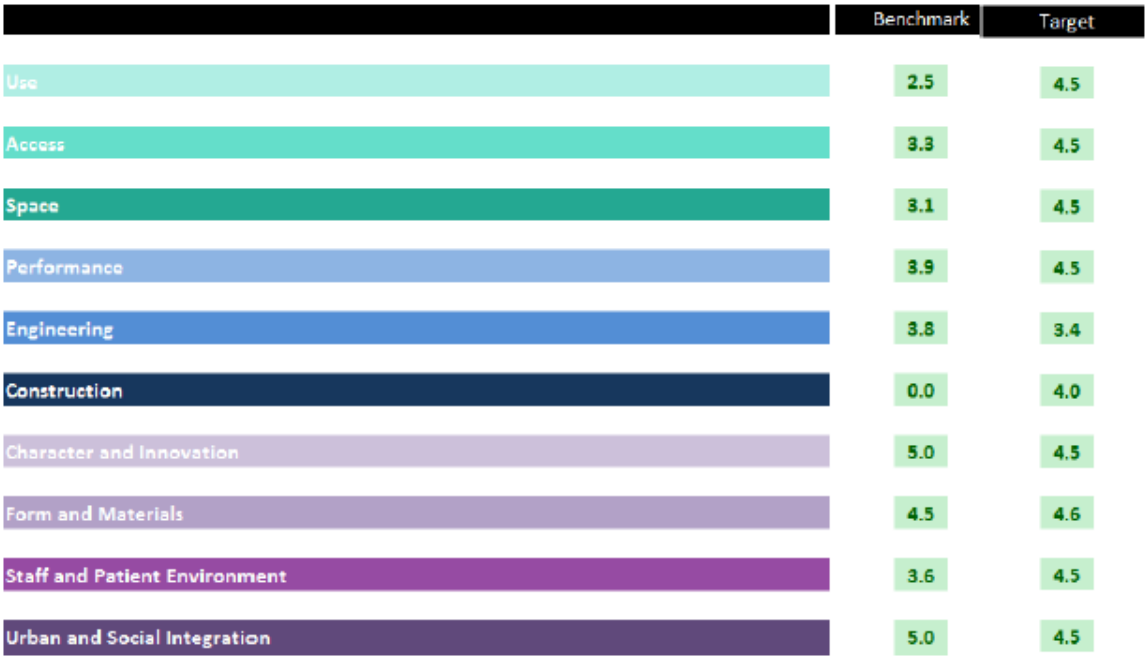
In addition the Achieving Excellence in Design Evaluation Toolkit (AEDET) process has begun a stakeholder workshop was held on 25th April 2017 to establish the AEDET scores for the existing facilities and arrangements. The summary results of the workshop which confirm the current benchmark scores are included in figure 38.

It is important to remember that this IA is being developed to provide additional capacity as the hospital is full, it is not a reprovision of an existing service as a result of significant need for refurbishment or backlog maintenance. The HFS AEDET refresh guidance would suggest that a score of at least 3 is achieved as a target in each category – as anticipated the AEDET process has identified a low 2.5 'Use' benchmark score for the existing facilities, whereas the agreed 'target' score for this service is 4.5 for use or functional appropriateness. The reason the 'Use' score was 2.5 is a result of two key factors:

- the existing facility is not capable of handling the projected activity throughput, and:
- the fact that as a result of multiple previous service expansions, the current facility is already being used as flexibly as possible to deliver services and cannot respond to further service change to enable expansion

Figure 81 outlines the Target AEDET scores for investment, AEDET targets are set at a minimum of 4.5, for 'Character and Innovation' and 'Urban and Social Integration' the existing facilities score 5.0 - the GJF aspiration is to continue to meet the current user satisfaction score of 5.0.

Figure 81: Existing Facilities Benchmarked against the 'Target' - AEDET scores



As part of the NDAP Design assessment process the IA, AEDET output and Design statement has been submitted to HFS for desktop assessment.

6 Is the organisation ready to proceed with the proposal?

	Question	Response
Commercial, Financial & Management Cases	**Is the organisation ready to proceed with the proposal?**	**Confirm:** • Procurement strategy & timetable • Affordability & financial consequences • Governance & project management arrangements

6.1 The Commercial Case

As set out in the Phase 1 IA**, 'FrameworksScotland2'** has been identified as the most appropriate procurement route. A full value for money and affordability assessment will be carried out at outline Business stage.

A summary of the indicative key project dates is provided in the table below, the timetable will be finalised once the IA is approved and the Principal Supply Chain Partner (PSCP) is instructed to commence work on Project 2.

Figure 82: High Level/ Indicative Project Timeline

Key Milestones Phase 2 Development:	Indicative Completion dates
Completion and GJF Board Approval of Initial Agreement for Phase 2	27th March 2018
Regional and National Engagement and Approvals Processes	April and May 2018
Submit IA to Capital Investment Group	31st May
Capital Investment Group meeting	28th June 2018
Design Development (RIBA Stage 2)	July 2018 – January 2019
OBC Completion & Approvals	January – March 2019
Design Development (RIBA Stage 3 & 4)	March – August 2019

FBC Completion & Approvals	August/September 2019
Phase 2 Construction Period	October 2019 – October 2021
Fit out, Commissioning & Assessment of Service Readiness	No later than Dec 2021
Facilities Open to Patients	

6.2 The Financial Case

The Board continues to achieve on its financial targets to remain within both its Capital Resource Limits (CRL), Revenue Resource Limits (RRL) and retain a financial break-even position. The GJF continues to deliver a very rigorous efficiency saving programme and over the last few years have successfully delivered in excess of our targets. The success of this has been the focus on redesign and innovation which supports the delivery of this expansion.

6.2.1 Indicative Capital Costs

Indicative costs for each of the proposed solutions are noted in Figure 83.

Figure 83: Indicative Capital Costs

Costs in £millions	Option 1	Option 2	Option 3
Capital cost (or equivalent value) - expansion	-	42,598,130	44,179,424
Capital cost (or equivalent value) - refurbishment		15,442,885	15,442,885
Total Capital Build cost		**58,041,014**	**59,622,308**
Equipment cost		12,600,000	15,000,000
Total Capital		**70,641,014**	**74,622,308**
Construction Optimism Bias (11.8%)		5,348,468	5,497,185
Total Capital (inc Optimism Bias)		**75,989,482**	**80,119,493**
Whole of life capital costs		108,441,414	119,622,308
Estimated Net Present Value of Costs		69,797,609	75,694,463

The capital costs for the build above have been provided by the cost advisor and are informed by the options described in the document.

The phasing of the capital spend has been prepared in partnership with the cost advisor, and is reflective of the stages of construction. It has been assumed for the purposes of the IA that all equipment will be purchased at the end of construction with all being purchased as new.

It has been assumed that the refurbishment costs will not be incurred until the completion of the building, however this is likely to be rephrased prior to submission of the OBC.

The other assumptions that have been made in the preparation of the capital costs are noted below:

- These are very high level indicative costs with the building costs provided inclusive of a prudent inflationary uplifts to reflective potential inflationary pressures.
- The costs provided are estimated on what will be included in the footprint for phase two expansion, the detail of this will be worked up over the coming months.
- The equipping costs are based on the likely cost of equipping theatres, wards, outpatients used in previous expansions.
- The refurb costs are based on a high level review of the Board wide masterplan – these will be subject to a detailed review of the plan prior to inclusion in the OBC.
- VAT has been assumed as non-recoverable. The recovery percentage will be agreed with HMRC prior to commencement of construction. In addition the project work that we have commenced with our VAT advisors will be concluded over the coming and a feasibility report produced

6.2.2 Capital Affordability

The costs are an estimate at this stage and would be required to be funded from the £200m elective centres earmarked funds
The likely value of impairment will be agreed with the valuer when construction has commenced and SGHSD will be informed of the value at that time.

6.2.3 Indicative Revenue Costs

The revenue costs of the project are required to support the increased demand from the analysis described in section 4. This describes the revenue (including staffing and consumables) required over the 15 years up until the year 2035. The additional indicative revenue costs over this period, for the 3 costed options are described in Figure 84.

Figure 84: Indicative Revenue Costs

	Option 1	Option 2				Option 3				
	Do Minimum	New Build	New Build	New Build	New Build	New Build	New Build	New Build	New Build	New Build
Options Revenue Category	NHS Highland repatriated capacity	2 Theatre by Dec 2021	3 Theatre by Jan 2023	4 Theatre by Jan 2032	Option 2 Total by 2035/36	2 Theatre by Dec 2021	3 Theatre by Jan 2023	4 Theatre by Jan 2031	5 Theatre by Jan 2034	Option 3 Total by 2035/36
	£'m	£'m	£'m	£'m	£'m	£'m	£'m	£'m	£'m	£'m
Forecast Costs										
Total Staffing Cost	0	2.08	7.13	11.91	**15.78**	2.12	7.34	14.25	14.84	**17.05**
Total Supplies Costs (incl. Overheads)	0	2.14	7.9	13.35	**16.95**	2.19	8.11	15.47	16.23	**18.25**
Managed Service - Theatre equipment	0	0	0	0	0	0	0	0	0	0
Depreciation	0									
Total Costs	**0**	**4.22**	**15.03**	**25.26**	**32.73**	**4.31**	**15.45**	**29.72**	**31.07**	**35.3**
Private Sector use on current capacity shortfall	48.37	48.37	40.71	27.21	**0**	40.71	27.21	8.16	7.174	0
Total Including Private Sector	**48.37**	**52.59**	**55.74**	**52.47**	**32.73**	**45.02**	**42.66**	**37.88**	**38.24**	**35.3**

Private Sector capacity shortfall is modelled on private tariff cost per case as included within recent Scottish Government expansion proposal and Elective centre transformational change section within the National Boards delivery plan. Annual forecast Demand for WoS Boards is based on the forecast capacity gap by specialty as detailed within section 4 of this Initial Agreement. This is a high level assumption at this stage but further benchmarking against confirmed WoS Health Board private sector usage will be completed for the Outline Business case stage. Figure 84 includes 100% of the demand will be provided in the private sector. The difference in revenue costs within Option 2 and Option 3 reflect both

a) Different size of the facility and staffing to support that and

b) Option 2 is based upon repatriation assumptions with NHS Lothian, NHS Grampian, NHS Tayside, NHS Ayrshire and Arran and NHS Highland with Option 3 assuming only NHS Lothian, NHS Highland and NHS Grampian repatriation.

The revenue consequences are based upon the existing Golden Jubilee financial model.

The additional revenue costs associated to the Golden Jubilee for the additional demand ranges from option 1 at an additional cost of £48m to Final Option 2 cost of £32.73m based on financial modelling for Orthopaedic, General Surgery and Endoscopy and final option 3 total cost of £35.3m.

This additional revenue would be phased over the next 15 years to 2035 in line with the demand projections shown.

As the service model position has not yet been agreed the ward and outpatient costs are high level at this stage particularly around General Surgery however these will be updated with more detail and model clarity by Outline business case.

The Do minimum option is cost prohibitive and not viable as this requires a high reliance on private sector use to meet the patient demands and allows for no additional capacity to provide this within the public sector. The additional revenue costs for Options 2 and 3 differ only due to repatriation assumptions and they are therefore reflective of the different activity plans within both options. In both Option 2 and 3 there is significant avoidance of private sector reliance which would offset the funding required to support this Phase of the elective centre expansion. This is shown in Figure 85.

Figure 85: revenue Expenditure and Income Summary

Expenditure & Income Summary	**Option 2 - £'m**	**Option 3 - £'m**
Total income needed	32.73	35.3
SG support by the year 2035	15.78	17.05
HB support by the year 2035	16.96	18.25
Offset by		
Private sector costs (100% capacity shortfall)	**48.37**	**48.37**

There is the opportunity for further innovation, service and costs review in progress for the following areas:

- Day of Surgery admittance (DOSA) programme – work continues to expand an accelerate the rate of achievement within Orthopaedic inpatients
- Development and implementation of Patient Level costing work within Orthopaedic to support planning, quality improvement and efficiency

- There is also a business case development group scoping out the option to procure a Robot for use within Orthopaedic Surgery which if approved would improve patient experience, Surgeon accuracy and both length of stay and other productivity and cost benefits
- Full implementation of innovative technologies such as Electronic Patient record and voice recognition

Figure 86 below reflects the Cost per case analysis across the Specialties and activities included within the financial analysis to provide additional background to the revenue costs.

Figure 86: Cost per Case Analysis

Specialty	Option 2 Additional Activity plan	Option 3 Additional Activity plan	Staff Cost per case - £	Marginal Cost per case - £	Total cost per case - £
Orthopaedic – Total hip replacement	1,397	1,520	3,398	2,898	6,296
Orthopaedic – Total knee replacement	573	778	3,398	3,458	6,856
Orthopaedic – revision Surgery	401	401	5,429	10,083	15,512
Foot & Ankle	93	458	494	869	1,363
Hand & Wrist	1,042	2,999	494	869	1,363
Endoscopy	10,301	10,301	318	356	674
General Surgery	2,000	2,000	1,534	882	2,416

6.2.4 Revenue Affordability

In considering option 2 and 3 these reflect additional revenue cost to the golden Jubilee of £32.73m and £35.3m respectively and will be incurred over the next 15 years to financial year 2035. This

directly reflects the increased activity which compared to the private sector this provides value for money, with the equivalent activity in the private sector incurring costs of £48m (based on private sector cost per case information at the time of completing the IA).

This is an unaffordable and unsustainable solution.

In terms of revenue affordability it is intended that funding will follow the Golden Jubilee funding model with the increase in revenue costs to meet the treatment time guarantees secured by Scottish Government funding for staffing costs and depreciation with supplies costs (marginal costs) provided by the West of Scotland Health Boards (as the referring Boards) to meet their increased patient demand.

6.3 The Management Case

A benefits register (see section 4.8.3) and the strategic risks have been identified and assessed as part of the development of this IA. To successfully manage and deliver this project and the overall hospital expansion programme. Clearly defined project management arrangements have been established and appropriately skilled and experienced staff have been recruited to lead and manage the delivery of the hospital expansion programme.

The project management approach is underpinned by the high level principles as outlined in SCIM 'Programme and Project Organisation Guide'.

6.3.1 Key Roles and Responsibilities

The **Senior Responsible Officer** is June Rogers, the Board Director of Operations. June leads on communication with the West of Scotland Health Boards and the West of Scotland Director of Planning. June has extensive experience of managing project and managing clinical services. June has direct experience of delivering many previous service expansions at the GJF and was also involved in the creation of the WoS Heart and Lung Centre in 2007. Through this experience June is able to provide expertise related to the projects development, governance and stakeholder management as well as having in depth knowledge of service models and performance.

The **Programme Director** is John Scott, John has been appointed specifically to manage the delivery of the hospital expansion programme. John has significant experience of delivering capital projects having previously worked as Head of Capital Planning within NHS Ayrshire and Arran. John has direct experience of delivering large scale capital projects having been Programme Director for a new £50m Mental Health & Community Hospital in Irvine which was completed in 2016.John will be responsible for directly managing the Kier Construction PSCP team and the Client Advisors.

The **Programme Manager** is Claire MacArthur, Claire has been seconded from her substantive role as operations manager within the surgical division at GJF to support the hospital expansion programme. Claire is an experienced senior manager with extensive experience of working with the acute hospital sector. Claire's key skills and experience include project management, stakeholder management, planning and managing clinical services, leading service reviews/ improvement projects and developing strategies, workforce plans and business cases. Claire directly manages the GJF operational programme team.

The **Clinical Lead** for the programme is Susan McLaughlin, Susan has been seconded from her clinical educator role and leads the ophthalmology work stream group developing the clinical model and supporting workforce training and education plans and with support from the wider team will lead on the commissioning process. Susan has significant senior nursing experience her key skills include stakeholder management and facilitation, leading quality improvement projects, developing, planning and facilitating national and local training and education for clinical and non clinical staff. Susan has recently completed the Scottish Improvement Leader Programme.

June, John, Claire and Susan have been involved with the project from the outset so have a detailed understanding of the project objectives and the process of delivery. All have confirmed capacity to continue within their roles ensuring continuity of knowledge and the required skill set.

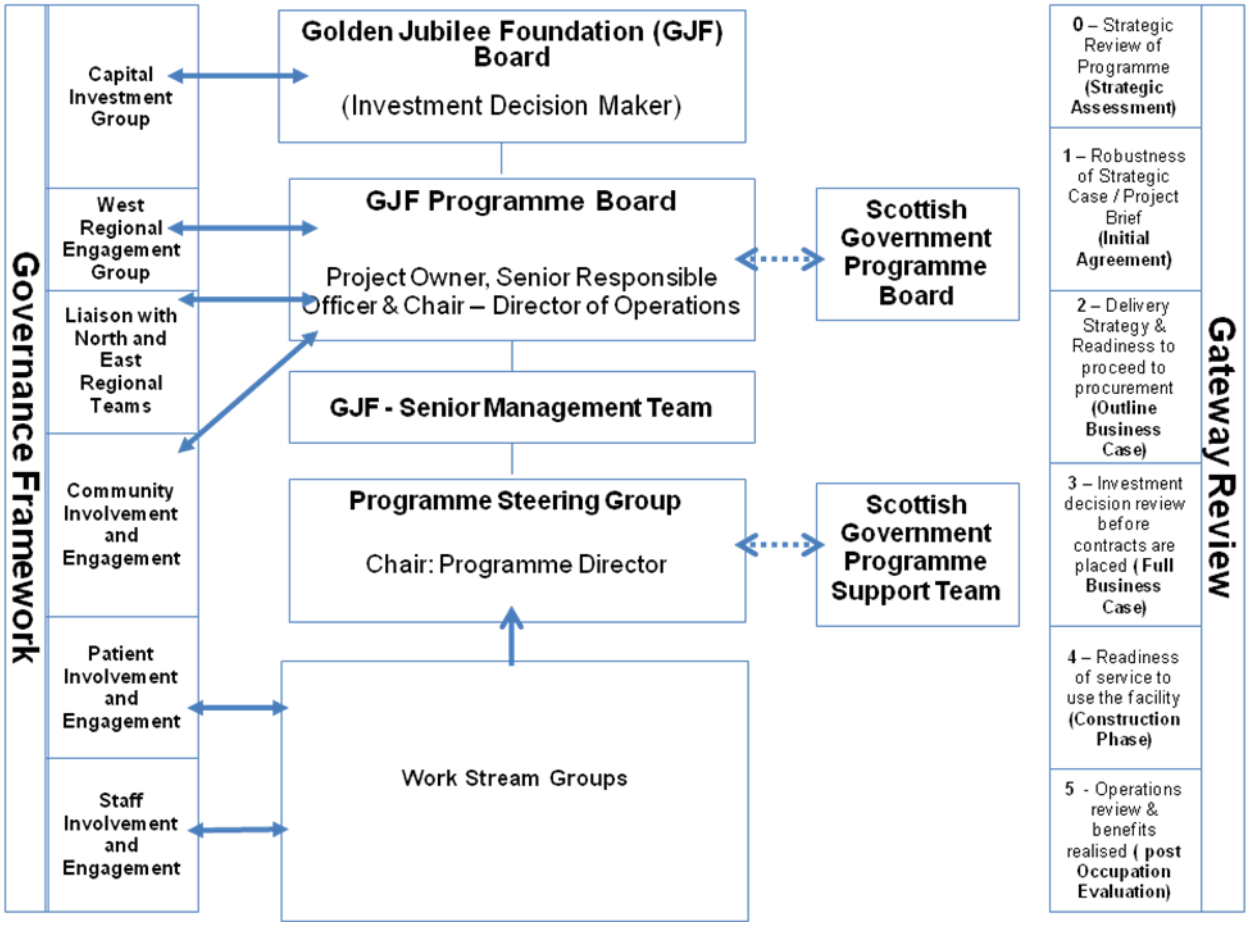
The GJF programme team will be supported both internally and by those appointed as Independent Client Advisors and the Principal Supple Chain Partner. Expertise of the key roles and key competencies is described further in figure 87 below, but in particular from Aecom through as Project Manager and Joint Cost Advisor. Further advice is available through NHS GJF's Head of Estates Gerry Cox, This experience together with the identified in Figure 88 (Programme Board membership) demonstrates that the project structure contains the required skill set to successfully deliver the project.

The programme team structure is outlined in Figure 89. A new role of a part time workforce planning manager will be recruited to shortly, it is envisaged this role can be recruited to from within NHSGJF. To date significant prevention and control of infection advice and support has been provided by Sandra McAuley, Clinical Nurse Manager- Prevention and Control of Infection who has been seconded to the programme team on a part time basis and provided regular and consistent input to the design development process. In addition NHS GGC have provided Consultant Microbiology support to the project, however going forwards it is unlikely they will have the capacity to continue to support the project. Therefore there is a need to recruit to a lead consultant microbiologist role as soon as possible and the process of identifying potential candidates is underway.

6.3.2 Programme Governance and Reporting Structure

The governance and reporting structure which has been put in place is set out in Figure 87.

Figure 87: Overarching Programme Governance Structure for Project 1 and Project 2

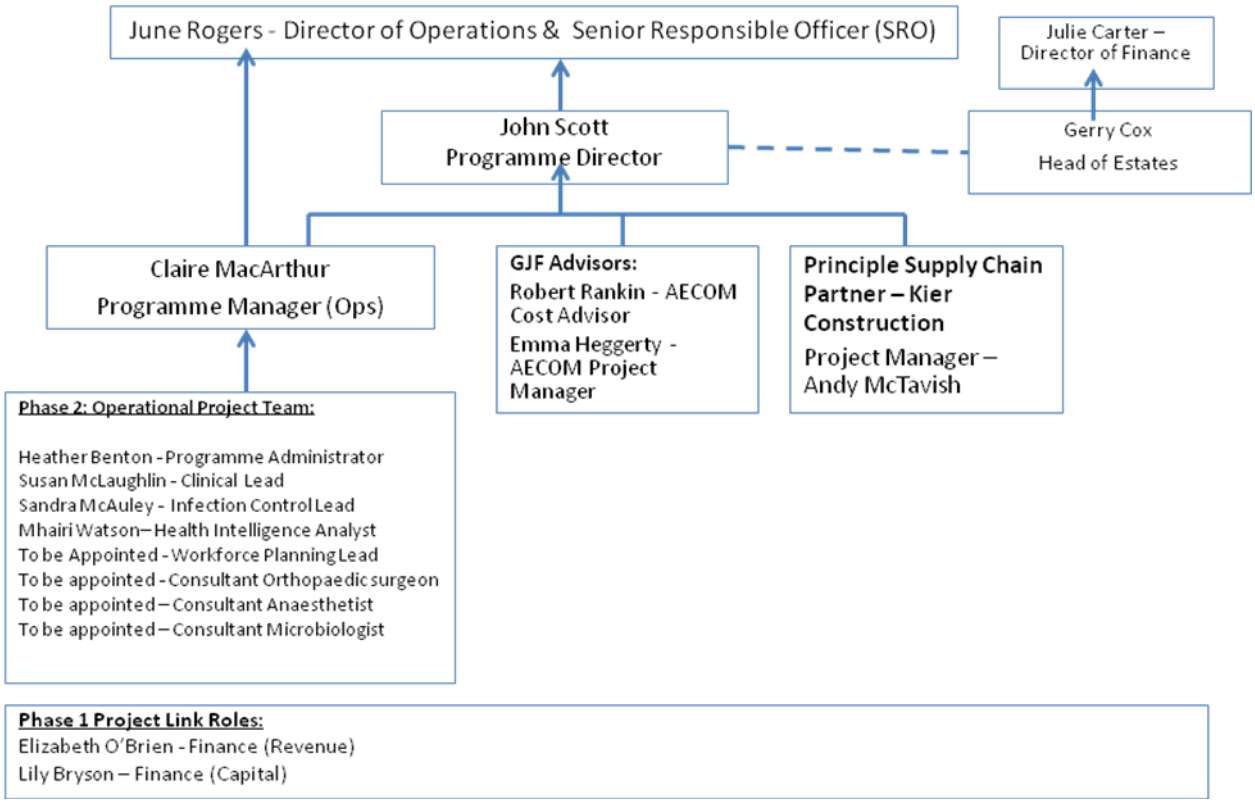


The Hospital expansion programme will be managed by a Programme Board Chaired by Jill Young, Chief Executive (NHS GJF), supported by June Rogers Director of Operations and Senior Responsible Officer. A West Regional Engagement Group has been established to ensure continual engagement with the West Region throughout the development of both Project 1 Ophthalmology and Project 2 Orthopaedics, and other surgical specialties. The Programme Board membership is set out within Figure 88 and includes representatives of the GJF senior management team, GJF Chairman, the director of regional planning, the Programme Director of the National Elective Centres Programme, Strategic Director, West Dunbartonshire Council, and Vice Principal Operations, West College Scotland.

Figure 88: Membership of the Programme Board

Role	Named Person
Chair of Programme Board and Chief Executive	Jill Young
Senior Responsible Officer & Director of Operations	June Rogers
Director of Finance	Julie Carter
Nurse Director	Anne Marie Cavanagh
Director of Global Development & Strategic Partnerships	Angela Harkness
Employee Director	Jane Christie-Flight
Medical Director	Mike Higgins
Interim Chair GJF Board	Stewart MacKinnon
Performance Manager, Scottish Government	Margaret Duncan
Head of Clinical Governance	Laura Langan Riach
Programme Director, National Elective Centres	Margaret Sherwood
GJF Programme Director	John Scott
Head of Corporate Affairs	Sandie Scott
Programme Manager, Ops	Claire MacArthur
West College Scotland Representative	
Head of Estates	Gerry Cox
Director of Regional Planning, West of Scotland	Sharon Adamson
Associate Operations Director, Surgical Division	Lynn Graham
Associate Operations Director, RNM	Lynne Ayton
Local Authority Representative	

Figure 89: Programme Team Structure and Reporting



6.3.3 Appointment of Independent Client Advisors

Those appointed to support the overall hospital expansion programme are detailed in Figure 90. Through the assessment and appointment process it has been demonstrated that those named have the required skills, experience, expertise and capacity to deliver this project.

Figure 90: Independent Client Advisors

Role and Organisation	Named Lead
Project Manager	AECOM
Joint Cost Advisor	AECOM
CDM Advisor	To be appointed
Supervisor	To be appointed

6.3.4 Regular Engagement with the West of Scotland Health Boards

A West of Scotland Engagement Group was established in January 2017 and has met regularly (8 meetings were held during the course of developing this IA). The group approved the demand modelling methodology used and is supportive of the forecast predicted need for orthopaedics, general surgery and endoscopy within the West Region. The need for significant additional elective orthopaedic capacity was unanimously agreed by all representatives. However as the West Regional Delivery Plan is being developed in tandem to this proposal, it was agreed that the Inpatient /day case general surgery requirements should be designed to be future proofed to potentially support another service should this be required within the region in the future.

The West of Scotland Engagement Group will continue to support the development of the OBC and ensure the solution supports the delivery of the West Regional Delivery Plan.

6.4 Summary of Governance Support for the Proposal

The table below provides an overview of the engagement that has taken place to date and the confirmed support for this proposal.

Figure 91: Governance Arrangements and Engagement to Date

Governance Group:	Engagement that has taken place	Confirmed support for the proposal
NHS Golden Jubilee Foundation	NHS GJF are fully supportive of this proposal, with Mrs June Rogers, Director of Operations taking the lead role in its development. Workshops attended by Board members included the benefits and risk workshop, the Design statement workshops and the AEDET workshop full details of director attendance is included within Appendix A3,A4 and A5. This proposal is also incorporated into the Board's LDP, and PAMs strategy documents. All of which have received NHS GJF approval. In addition this proposal is incorporated within the Scottish Government Health and Social care delivery plan Dec 2016.	This Initial Agreement was approved by the NHS GJF Board on XXXXX
Service or Department	The Director(s) involved in this project are Mrs Jill Young, Chief Executive Mrs Julie Carter, Director of Finance and Deputy Chief Executive Mrs June Rogers, Director of Operations & SRO	This Initial Agreement was approved by the service directors at the Senior Management Team meeting on Thursday 26th April 2018 and at the Hospital Expansion Programme Board meeting on 3rd May 2018.

	Their responsibility and involvement is set out in section 6.3 of this IA.	
Scottish Health Council	SHC participated in our stakeholder workshop and have indicated they are supportive of the approach proposed for continued stakeholder engagement throughout the duration of the project.	SHC participated in our stakeholde workshop and have indicated they are supportive of the approach proposed for continued stakeholde engagement throughout the duration of the project.

6.5 Readiness to proceed

Figure 92: Assessment of readiness to proceed

Project:	Golden Jubilee Hospital Expansion Programme – Phase 2 Orthopaedics
Is the reason made clear why this proposal needs to be done now?	See section 4
Is there a good strategic fit between this proposal, NHS Scotland's Strategic Priorities, national policies and the organisation's own strategies?	See section 2
Have the main stakeholders been identified and are they supportive of the proposal?	See section 4.3.3
Is it made clear what constitutes a successful outcome?	See section 4.8.3
Are realistic plans available for achieving and evaluating the desired outcomes and expected benefits to be gained, including how they are to be monitored?	See section 4.8.3

Have the main project risks been identified, including appropriate actions taken for mitigating against them?	See Section 4.8.4
Does the project delivery team have the right skills, experience, leadership and capability to achieve success?	See Section 6
Are appropriate management controls explained?	See Section 6.3
Has provision for the financial and other resources required been explained?	See Section 6.2

7 Is this proposal still a priority?

	Question	Response
Conclusion	**Is this proposal still important?**	**Confirm:** • Strategic Assessment template

To achieve NHS Scotland's quality ambitions of providing safe, person centred, effective care there is a real need for this proposal to proceed to the next stage, Outline Business Case.

Progressing this proposal will allow the following investment objectives to be met:

1. Improved current service capacity to meet the significantly increased predicted demand between now and 2035
2. Improved capacity to facilitate the reduction or elimination of routine use of the private sector
3. Improved capacity and performance to ensure the delivery of current and future Scottish Government guarantees for inpatient / day case waiting times on a sustainable basis
4. Provision of sufficient dedicated elective capacity to reduce the likelihood of cancelling patients. Reduce variability and introduce innovative models of care – to improve overall service performance within Orthopaedic surgery, General surgery and Endoscopy. This will deliver increased service efficiency and productivity
5. Provision of a new improved environment and facility - integral to supporting the more innovative models of care and also essential to support improved clinical productivity
6. Implementation of efficient models of care in a state of the art environment adopting best practice principles (nationally and internationally)
7. Development of a workforce model that supports recruitment retention and supports staff wellbeing and development whilst also ensuring the workforce model is efficient and sustainable

Glossary of Terms

IA	Initial Agreement
PID	Project Initiation Document
GJNH	Golden Jubilee National Hospital
GJF	Golden Jubilee Foundation
WoS	West of Scotland
NTIG	National Theatre Implementation Group
OBC	Outline Business Case
OECD	Organisation for Economic Co-operation and Development
VC	Video Conference
SHC	Scottish Health Council
HSF	Health Facilities Scotland
ADS	Architecture and Design Scotland
NDAP	NHSScotland Design Assessment Process
AEDET	Achieving Excellence in Design Evaluation Toolkit
PSCP	Principal and Supply Chain Partnership
SRO	Senior Responsible Officer
SNAHFS	Scottish National Advance Heart Failure Service
CRL	Capital Resource Limits
RRL	Revenue Resource Limits
ISD	Information Services Division
SA	Strategic Assessment
PAM	Property Asset Management
OPCS	Office of Population Censuses Survey
THR	Total Hip Replacement
TKR	Total Knee Replacement
BMI	Body Mass Index

F&A	Foot & Ankle
H&W	Hand & Wrist
GI	Gastrointestinal
JAG	Joint Advisory Group
EES	Employee Engagement Service
IPDC	Inpatient Day Case
DOSA	Day of Surgery Admission
ESP	Extended Scope Practitioner