

# Final Report

## Developing a 'design of space' intervention using Lean thinking



# Contents

1.0 Abstract .....	4
1.1 The project team .....	4
1.2 Please provide a brief overview of your project .....	5
1.3 What was the problem that you were seeking to address? .....	6
1.4 What were the original aims of your project at the point of your proposal? .....	7
2.0 Journey .....	10
2.1 What changes have you made along the way? .....	10
2.2 What has happened throughout the lifetime of your project? .....	11
2.3 Who was involved in the project and how have you managed those relationships? .....	12
3.0 Impact .....	16
3.1 What has your project delivered, what difference has it made, and in what ways? .....	16
3.2 What outcomes have you seen and what impact has the project had? .....	17
3.3 How did you measure the impact and outcomes of your project? .....	18
3.4 What has your project added to the discussion or evidence base for corporate and clinical teams working together in improvement? .....	20
4.0 Learning and challenges .....	22
4.1 What have you learned throughout your project? .....	22
4.2 What were the unintended consequences and side effects of your project? .....	23
4.3 Advice for others attempting to replicate our work in another organisation or setting .....	24
4.4 Reflections on how change happens, new models of care and evaluating complex change .....	25
5.0 Embed and Spread .....	27
5.1 In what ways has your intervention been sustained? .....	27
5.2 What success have you had to date in spreading and publicising your work, and what are your future plans in this area? .....	28
5.3 Resources .....	30

# Section 1

## Abstract



“I’ve taken part in a Lean event before, but this far outweighed anything I’d expected. Building it to full size. It just gave us a much better idea of what we were dealing with.”

Charge Nurse



“Getting the right people in the room at the same time is magnificent. It really delivers a much better brief from which to develop a workable scheme.”

Architect



“I thought it was great that you could flip from having an idea to actually helping just build something...”

Consultant

# 1.0 Abstract

## 1.1 The project team

**Title:** Developing a 'design of space' intervention using Lean thinking

**Lead organisation:**

North East Transformation System hosted by Gateshead Health NHS Foundation Trust

**Partner organisations:**

- North East Transformation System (NETS) Team
- Gateshead Health NHS Foundation Trust (GHNT)
- City Hospitals Sunderland NHS Foundation Trust (CHS)
- Newcastle University Business School (NUBS)

**Core team members:**

- **Iain Smith**, Head of the North East Transformation System, **Programme Lead**, GHNT
- **Gary Prior**, NETS Programme Implementation Manager, **Project Manager**, GHNT
- **Richard Johnston**, Capital Development Manager, **Project Architect**, GHNT
- **Geoff Hogg**, Service Improvement Facilitator, **Spread Link Manager**, CHS
- **Chris Hicks**, Professor of Operations Management, **Evaluator**, NUBS
- **Tom McGovern**, Director of Business Strategy Research Group, **Evaluator**, NUBS

**Abstract:**

Lean is a philosophy that aims to reduce waste and improve processes. Processes however, can be constrained by the space they operate in. Redesigning space offers unique opportunities for step change improvements using Lean thinking.

Despite cuts NHS capital budgets total circa £4 billion per year, a significant proportion is spent on improvements to premises or development of new premises. Though guidance is available to support estates projects, it does not incorporate information on how to design in Lean concepts and flow. We believe this represents a significant gap.

The Lean Design of Space (LDoS) project set out with an aim to design a structured improvement event to 'design in' Lean principles into new spaces/premises. The project's journey, impact, learning and challenges are summarised in this report. Detailed descriptions of pilot cases will be presented in the project's evaluation report which is being prepared based on work carried out by the programme lead towards the completion of a PhD and supplemented with additional external evaluation from academic partners.

**Date:** 15 January 2016

**Authors:** Gary Prior and Iain Smith

## 1.2 Please provide a brief overview of your project

Despite recent cuts, NHS capital budgets total around £4 billion per year, a significant proportion of this is spent on improvements to premises or development of new premises. Although guidance is available to support estates projects – including building notes, health technical memoranda and health facilities notes – this does not incorporate information on how to design in Lean concepts and flow.

Our project sought to help Trusts reduce waste and improve processes, by redesigning space more effectively using Lean methodology. We recognised that processes are constrained by the space within which they operate, and believed that by applying Lean methodology to the design of spaces, it would be possible to reduce waste and improve processes.

Our project focussed on learning with estates staff, clinicians and quality improvement staff about how to work together to produce better designs and create less wasteful processes, using Lean methodology. The project was led and coordinated by our North East Transformation System team and drew on the expertise they have developed through working with the Virginia Mason Medical Centre (VMMC) – a Lean healthcare early adopter. In our project we created an intervention structure for a workshop based approach to improvement and change through facilities design inspired by the Lean 3P method (an approach to product and process design for Lean manufacturing). We tested and refined the approach iteratively through application of the intervention in three facilities design schemes.

By prioritising service flow, improving processes and reducing waste, we believe that our project has helped staff to create facilities designs that will improve patient experience, safety and effectiveness of care.

Figure 1 - Clickable Video Dashboard

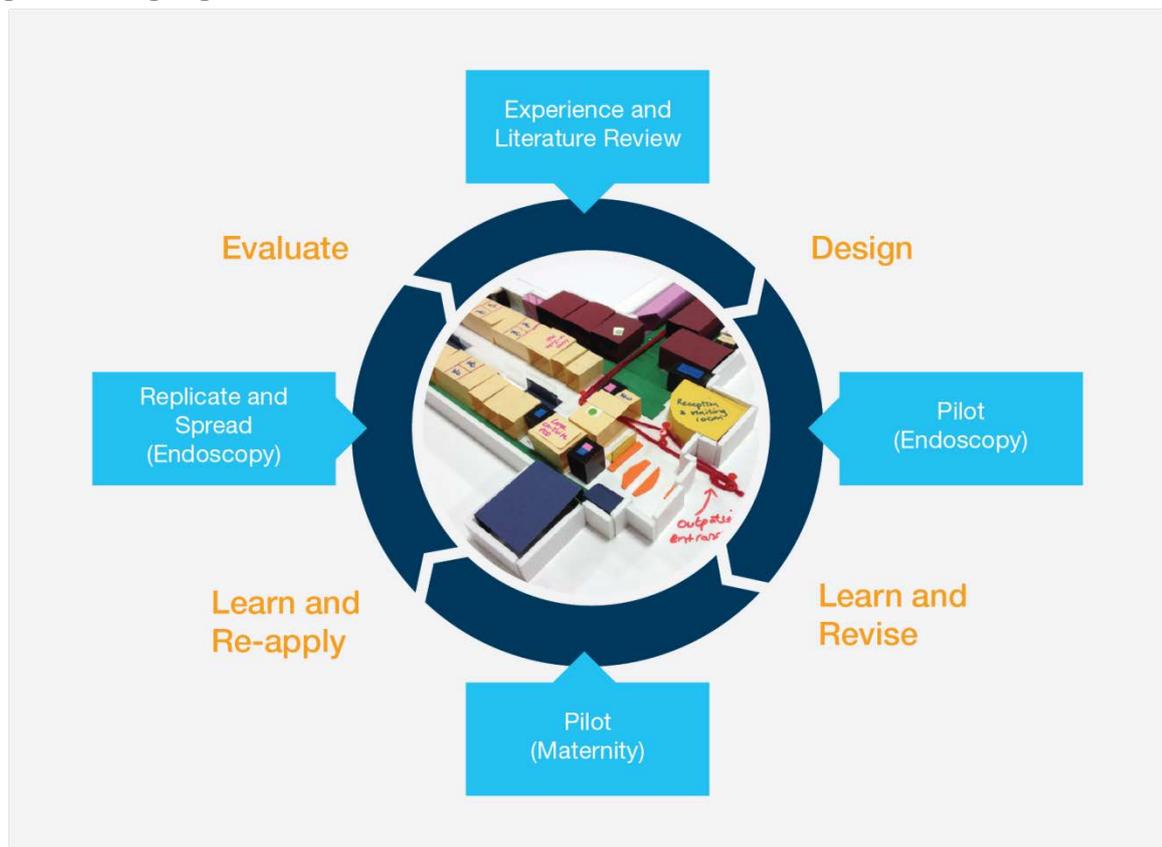


### 1.3 What was the problem that you were seeking to address?

Our project recognises that the physical environment in which healthcare is delivered is an important dimension of quality. Unfortunately processes can be constrained by the space they operate in and whilst many NHS organisations have continuous improvement programmes in place, they are generally used to improve existing services and not typically applied to the design of buildings. This became evident from the literature searches we carried out before and during our setup phase. Though there are cases examples (mainly from North America) of using Lean techniques in facilities design, we found very little published empirical research detailing how to use such processes to help stakeholders design in Lean principles.

Furthermore, from our experiences of using Lean to make continuous, incremental changes, we have learned that good layout of work areas can release time through reduced motion and searching for needed items. Achieving such improvements to working environments often requires the help of estates and facilities colleagues. We had noticed however, that estates and facilities corporate functions are not routinely involved in continuous improvement.

Figure 2 - Designing the intervention



We believed there was a gap in terms of theory and application and that we could fill it with our proposed intervention. With the support of The Health Foundation, we established the Lean Design of Space (LDoS) project in which we set out to create a structured approach to

designing new spaces/premises. Our project set out to address the gaps by bringing together the estates and quality improvement corporate functions with clinicians to design and test a Lean facilities design intervention that could be applied to new or refurbished spaces/premises. In line with the aspirations of the Health Foundation's Shared Purpose programme we set out to:

- raise awareness of the importance that the physical infrastructure has in providing quality care and the role corporate support services, such as estates, can play;
- create examples of estates professionals and clinical teams working together to improve quality of care through facilities design;
- describe an approach rooted in Lean methodology that facilitates cross-functional design and develop the evidence base of how and why it works.

Our project worked with two acute foundation trusts, first piloting a Lean design approach in two different settings in one trust (endoscopy and maternity) and then replicating, or 'spreading' the approach to a similar setting (endoscopy) in the second trust. This allowed us to both iteratively improve the intervention as well as observe the responses of different stakeholders, facing different design challenges and constraints in different contexts.

#### 1.4 What were the original aims of your project at the point of your proposal?

The original aims of the project can be split into intervention process aims and intervention outcome aims.

Our process aim was focused on designing, testing and documenting an approach to the Lean design of space. This would fill a gap that previously existed in both the theory and practice of how Lean processes work to design healthcare facilities. Consequently the process aim could be summarised as "the creation of a process to help stakeholders to design in Lean principles when developing new, or refurbishing existing, healthcare facilities".

Our original intervention outcome aims were focused on aspects of healthcare which can be easily measured. The biggest challenge here however, was that in order for us to truly measure and verify the outcomes of the interventions, the facilities designs created in the events would subsequently have to be built. This can be a lengthy process in the NHS requiring multiple iterations of business cases before final decisions are made and finances are committed plus there is also the lead time for construction to take place. To overcome this measurement problem, we encouraged staff to make extensive use of simulation using scale and full scale models of their designs.

To date, one of our three design interventions (an endoscopy unit) has proceeded to full business case approval and construction started in July of 2015. The design, which was created by the clinicians and corporate support staff, has built in features which we believe will impact positively on the following three categories:

**Safety of care process** – the model created has enhanced levels of infection control built into the design. For example transport routes for sterile and used scope have been separated and admit/recovery PODs have been designed so that used linen is removed via a chute to ensure that it doesn't come back into contact with the room.

**Patient experience** – the design eliminates much of the travel that a traditional unit imposes on the patient, this is in direct contrast to units found throughout England, Scotland and Wales and which are still being built. The design also heightens the levels of dignity and respect the patient experiences - a key aspect of patient centred care.

**Effectiveness of care** – we have had examples of nurses walking 7.1km per day. That is about an hour and a half of time that can never be taken back. Reducing this time through features such as decentralised stations and well thought out storage areas, which is essentially reducing the non-value adding activities, will create significant opportunity to increase the effectiveness of care.

We believe that we have met these aims. None of it would have been possible if we didn't break down those silos which so often exist between clinicians and corporate support staff. Thus much of our "success" was down to the synergies that can occur when clinical and corporate support staff work effectively together. This was also one of the things we knew would hinder the work from succeeding and so we had many meetings with different organisations at the beginning before deciding if we would work with them or not.

**Figure 3 - The Lean Facilities Design Cycle**



## Section 2

# Journey



“When you’re looking at plans, it never looks the same. This process for me meant that I could actually physically see it. It was very visual for us.”

Directorate Manager



“It’s a brilliant idea to get the patients involved. We’ve been able to put forward our views on what will give the best experience.”

Patient Participant



“I had never seen mock rooms built in that way and I thought it was an absolutely fantastic way of doing it.”

Consultant

## 2.0 Journey

### 2.1 What changes have you made along the way?

During the setup phase of our project, there was a significant amount of 'churn' in the project team. Identifying facilities design projects at the right stage where the design can be influenced was not straightforward. Moreover, this is probably one of the most important factors to consider when choosing to initiate a piece of work or not. Although it was clearly highlighted, at the application stage we did not know definitively where, or on what service, we would be carrying out our facilities design pilots. Therefore, in the early stages of shaping the project, significant time was invested in engaging various stakeholders and communicating a consistent message regarding what the project was about and what it hoped to achieve. We found that some organisations were very interested in what was being proposed but had recently completed large capital developments and so had no pilots to offer. We found others with pockets of strong interest in the service improvement corporate services but with less enthusiasm in the estates departments. However, the time spent in this setup period proved invaluable in identifying and building a core team that had the enthusiasm and potential design schemes to make our project a success.

Throughout our project the aims have remained consistent but we have adjusted course as circumstances dictated to ensure we reached our planned destination. For example, at the time of pilot site selection only one option existed that met our selection criteria. However, moving forward with this option led to subsequent pilots, including spread work in a neighbouring trust. Also, in the implementation phase we had initially planned one intervention in the first year followed by a second one in year two. However, shortly after the initial pilot, unanticipated opportunities arose to run two further events a year ahead of schedule. With our new found knowledge from the first workshop, we decided to pursue these opportunities to conduct further fieldwork rather than stick rigidly to this plan. Ultimately this pragmatic approach gave us greater opportunity to learn in the field through action research which provided a richer experience and dataset. Consequently, group reflection and after action reviews shaped the planned training output to be more of a taster session as opposed to a belts and braces course which would turn delegates into Lean design experts. This feeling was shared by many of the practitioners in the group be they from estates, quality improvement or a clinical background.

From a practitioners point of view the biggest learning came from reducing the total number of days the design workshops ran for. This highlighted an unintended consequence around the complexity of different clinical systems. For example, we found endoscopy pathways to be relatively straightforward. It was quite achievable to reduce the number of days from five to four and still achieve the required outcome. However, working on a maternity design highlighted additional system complexity. Here, the pathway must be reactive to the acuity level of the birth (e.g. this may involve theatres and SCBU which are separate subsystems within it). On reflection we feel it may be better to take a different approach when looking at more complex systems. This might involve starting with macro level system design and then subsequent mini interventions for the relevant microsystems.

## 2.2 What has happened throughout the lifetime of your project?

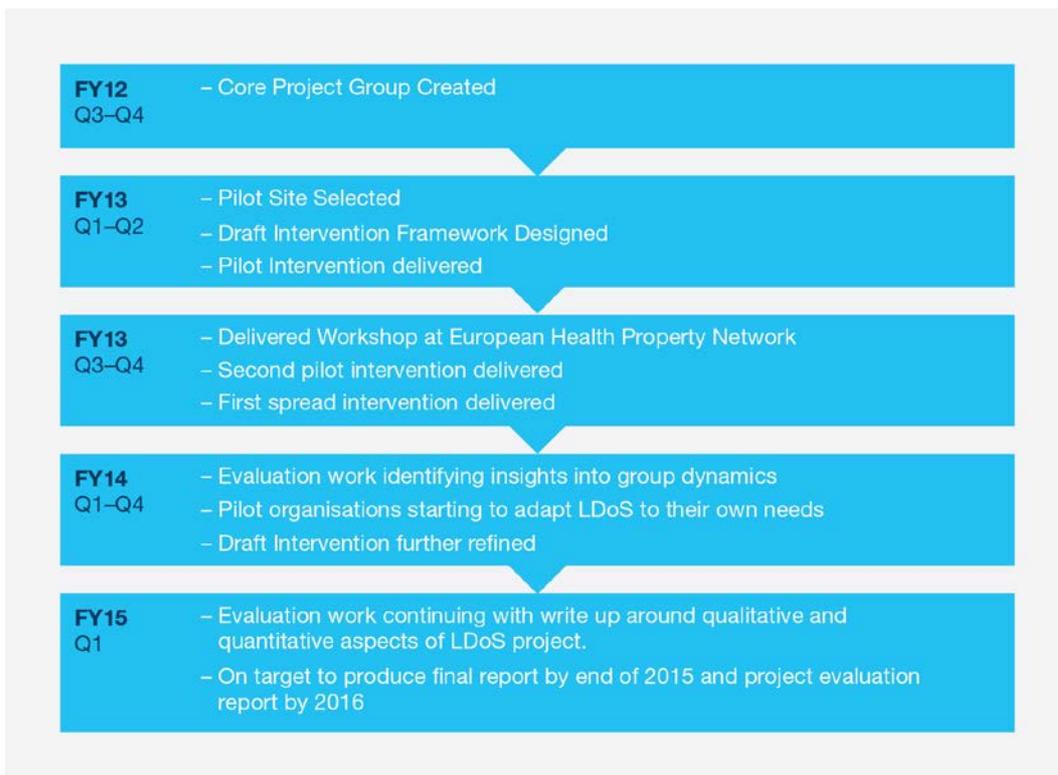
Looking back on our project we agree that there were certain milestones in our journey which shaped our overall direction of travel. By July 2013 we felt that we were progressing well. We had set up the project team, we had recruited a pilot site and we had spent some time designing a draft intervention framework which we would be testing with clinical staff from the pilot unit, patients and corporate support staff from the host hospital.

Most importantly by this time we had also delivered and in so doing tested the pilot intervention on a real life project. This resulted in the creation of a cutting edge design for an endoscopy unit. We also were in a fortunate position by this time to have carried out a number of after action reviews to explore what had happened, why it had happened and what worked so well and less well. We had also touched on things we would not include or test in future events.

To understand what the intervention was you have to think about a cross functional team. There has been a lot written about these teams but very few have used this approach for designing a healthcare unit. What we did was work with a group of people from both clinical and corporate backgrounds in the lead up to the intervention. This group got progressively larger, as we had planned, as we drew closer to an event. We then had people who would not normally work together do so for an intense period of five days.

This resulted in many interesting things such as team creation, disagreements, breakthroughs and even the perceived collapsing of hierarchies to a certain degree. As this happened, the teams worked together towards an ultimate aim - the creation of a conceptual architectural blueprint which could be worked up into the relevant working drawings.

Figure 4 - Major LDoS Milestones



By December 2013 we had really started to pick up speed in terms of testing interventions. We had delivered the second pilot intervention, this time for a maternity unit. We had also secured a spread pilot, outside of the traditional NETS network. This was for another endoscopy unit and can be traced back to conversations between local clinical networks outside of the NETS group altogether. About this time following an impromptu talk about some of the work we completed we were asked to attend and deliver a workshop in Hungary for the European Health Property Network. This was unexpected and unplanned but proved a great experience to network with likeminded people as well as share news about the project to other nations.

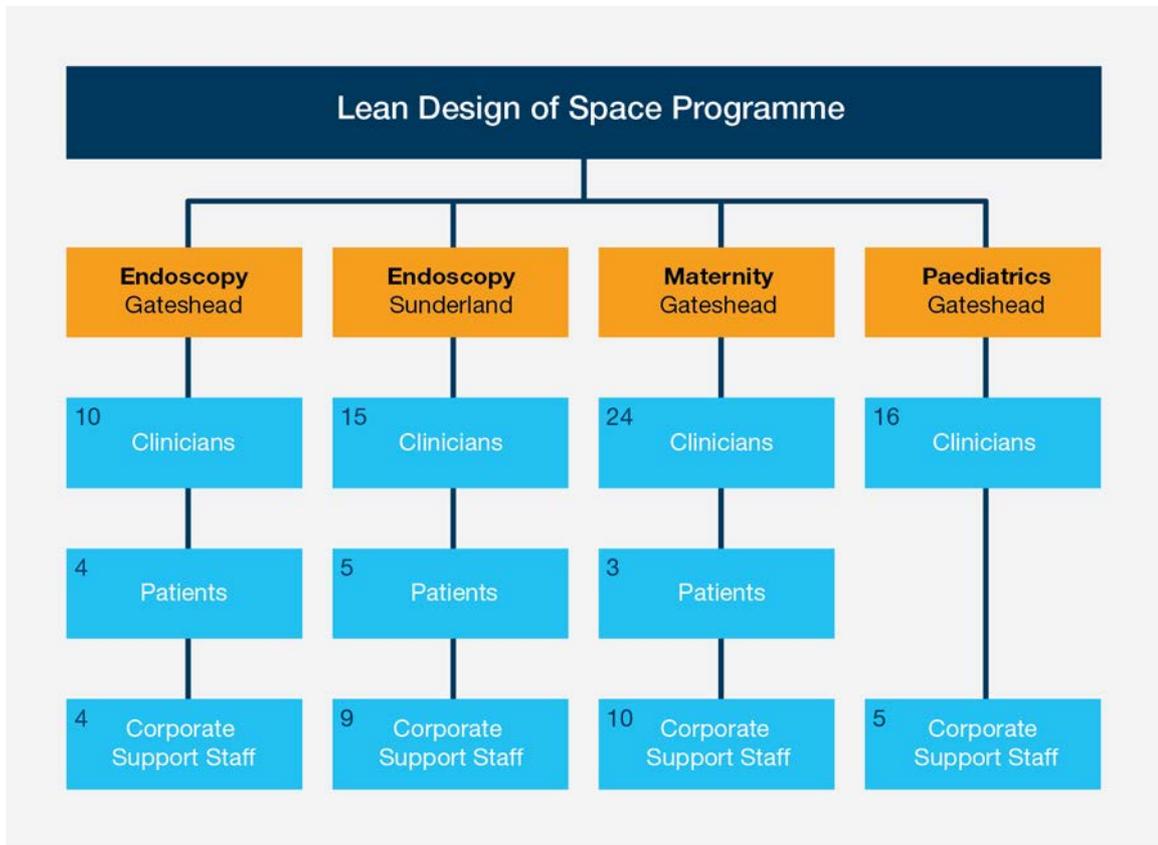
By July 2014 we had started to make some serious inroads into the evaluation work. This was made possible by ample numbers of interventions in year one of implementation. We had also tested out the training materials on three sites spread across two organisations. By December 2014 we started to notice a change in one of the organisations we worked closely with. They ran a version of our intervention, with some help from us, on a paediatric unit relocation project. There was also further data collection carried out and numerous interviews with patients, clinicians and corporate support staff in order to build an in-depth library of evaluation material.

As for 2015, evaluation and write up will continue with the aim of producing the final report by the end of the year and the evaluation report in 2016.

### 2.3 Who was involved in the project and how have you managed those relationships?

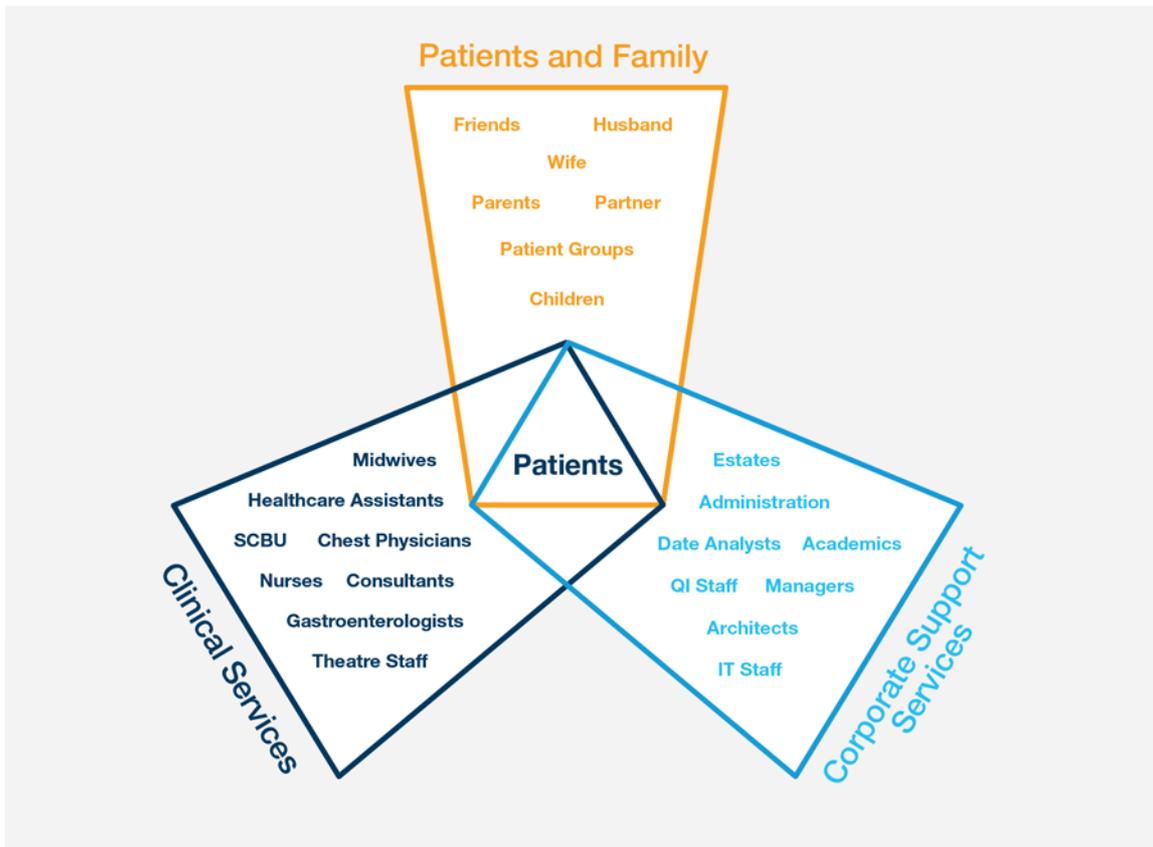
We have had over 114 people actively involved in our programme across three full intervention projects and one adapted method project. The key stakeholders varied per project. Initially it was heavily dependent on sponsorship from Estates and Facilities, however as time went on and news of the project spread certain clinicians became a key player in their specific project. The best example of this is the first spread site, an endoscopy unit at Sunderland, where a clinical lead did a lot of work in the background to make it happen. This is interesting on a number of levels. Firstly it shows the power of informal networks as this is how she learned about our work and secondly it shows how exceptional leaders can make things happen within a tight timescale. The graphic below shows an overview of the four interventions carried out during the implementation phase.

Figure 5 - Direct Impact: Number of participants in each intervention workshop



The approach to engagement was somewhat different for all projects. There was a slow and gentle introduction with the initial pilot site. This involved off site meetings and knowledge capture activities to ensure that they knew what was going to happen. However by the time the spread site came around there was a much bigger pull to make it happen so things were able to move forward at a quicker pace. This was true for the third site also where a compromise was made; this involved reducing the time frame but increasing the level of clinical input which we believe was a fair trade off. The fourth site was again different. In this case both the corporate and clinical services were having trouble aligning their expectations. For this reason it was deemed useful to adapt the method we had used previously in order to facilitate agreement. The adapted method focussed mainly on full scale mock-ups of the proposed design and simulated walk-throughs to help staff to both visualise and feel the space available. The diagram below is a representative picture of all the teams we worked with as part of this project.

Figure 6 - Stakeholders Map



In addition to our own project group meetings, we found timeout events with the Health Foundation to be one of the best ways to build and maintain relationships with our internal stakeholders. As a project group we found these events gave us time and space to reflect on our project’s progress and use our learning to plan next steps. More importantly, however, it helped us to develop stronger relationships and trust between project group members which has helped us to hold more open conversations and uncover assumptions about the project to enhance our learning and knowledge capture.

# Section 3

## Impact



“The change will be fantastic. They’ve sorted out the patient pathway so there’s much less travel and you can be seen as quickly as possible.”

Patient Participant



“I think it is fair to say that everybody who was there at that 3P event, from whatever background, part of them is in this design.”

Consultant

## 3.0 Impact

### 3.1 What has your project delivered, what difference has it made, and in what ways?

Our project has delivered a method that integrates seamlessly the collective wisdom of corporate support and clinical services to inform new facility and refurbishment design. We have been blown away by the extraordinary capacities for innovation demonstrated by the teams we have worked with. Who would have imagined that 30 people, 27 of whom had little to no building experience, working passionately together would come up with a fully worked up design in four days? Better still is the fact that the design they came up with is currently being built into what has been described as a flagship model for Endoscopy units within the UK. A summary of the project's key deliverables is shown below.

#### 1. Impact on QI Methodology

- Adaptation of a participative facilities design method for application within the NHS.
- Validation of the approach through pilot application and replication in the field.

#### 2. Impact on Patient and Clinical Experience

- A flagship endoscopy unit designed using our method.
- A workable solution for a second endoscopy unit which had to double capacity over the coming five years with only 17% more space; essentially moving staff from a feeling of it's impossible to it's possible.
- A wrap around maternity unit which meets the needs of small to medium sized hospitals at a lower cost by bringing care to the patient.

#### 3. Impact on Estates and Corporate Services

- Architects report improved project brief from applying our participative design approach.
- Troubleshooting a paediatric department design and finding a solution in one day for what was a protracted process running well over nine months.
- There is anecdotal evidence from architects involved in our pilots that our approach can reduce lead times for project briefs and may impact positively on project costs.

The fact that our method allows groups to work more cohesively together helps engage both corporate support services and clinical services in Lean led design. This was our main aim and we believe that the above points demonstrate we have been successful in achieving it.

We believe our project will impact positively on the local health economy. Our project has involved two local NHS Foundation Trusts in three facilities design interventions. Upon successful completion of the designed buildings, these interventions have the potential to reach the following patient populations:

- Pilot endoscopy unit – projected 8,000 to 10,000 patients per year
- Spread endoscopy unit – projected 8,000 to 10,000 patients per year
- Pilot maternity unit - up to 3,000 births per year

This is due to the successful application of Lean 3P to facilities design.

### 3.2 What outcomes have you seen and what impact has the project had?

Our project has demonstrated that corporate support services can help improve quality of care. We have worked with teams to create an intervention that they have used to develop designs which will significantly increase the levels of safety, privacy and dignity for their patients. We have also helped minimise the opportunities for infection control breakdowns to occur through innovative separation of clean/used supply routes being physically built into designs.

The following three perspectives provide some illustration of how our method has been a really good model of engagement for the stakeholders involved.

1. **Management perspective** - Management found that the main benefit was "...certainly the patient participation. And the mixed discipline participation". This was different to the typical design process which would usually involve a far smaller amount of people, primarily made up of management and one or two representatives from estates. Management further went on to say that it was energising to "get everybody's opinion. Anything from a patient, to a clinician, the admin staff and the nursing staff of all different disciplines which meant that it wasn't just one person's or two people's design. There was twenty six of us there". From this feedback it would appear that management can appreciate the benefits of participatory design.
2. **Clinician perspective** - Clinicians also recognised the benefits of looking outside their area of expertise. One clinician told us that "I work principally in endoscopy rooms and I can see how the rooms work. I can visualise what I want the final product to be like. But I have less understanding about how the admin area works, how the reception works and what's involved there. What happens in the decontamination area, what happens in terms of stock control and the linen cupboards? And how patients are best recovered by the nursing staff". This indicates the limitations of functional thinking but more importantly provides evidence on how participatory design can be used to alleviate this.
3. **Corporate Support Services** - Architects liked the interaction and rapid feedback from users which helped define a far more detailed brief than is typically the case under traditional healthcare facilities design approaches. They have also reported that the interaction between participants in constructing full scale mock-ups for simulation and testing is beneficial. Some have reported changes in their own practice to adopt aspects such as rapid, full scale mock-ups to help staff groups visualise and understand proposed designs and available space.

In conclusion from a quality improvement perspective it was obvious that all parties were working together for the greater good of the patient. As time went on it was nice to hear people talk about a move away from adversarial-like meetings to more productive and cooperative ones. This we believe is due to the intervention as a mechanism for building productive relationships.

### 3.3 How did you measure the impact and outcomes of your project?

We are acutely aware of the difficulties that can arise when trying to measure the impact of QI work. Nevertheless we decided to take a dual approach. It comprised both qualitative and quantitative measures.

Workshop intervention measurements have adopted a ‘before’ (a base-line) and ‘after’ approach to help staff identify rapidly what has worked, where it has worked, and why it has worked.

We proposed using metrics that help us to assess impact in four domains: quality and experience; lead time; productivity and efficiency; and costs. Using literature on measurement of Lean initiatives in healthcare, we developed the metrics framework shown below for use in our pilot workshops - though not all workshops had the same aims and so different subsets of metrics were used.

**Figure 7 - Workshop Metrics**

	Quality and experience	Lead time	Productivity and efficiency	Costs
Feedback from users	●		●	
Wait and treatment times for patients	●	●	●	
Patient travel distance	●	●		●
Floor space utilisation		●	●	●
Cost of workshop intervention			●	●
Cost of space / capital charge			●	●

● Primary impact  
 ● Secondary impact

We have been able to capture the following before and after measurement through the use of simulation in our workshops. As stated previously reducing patient travel distance for elderly and frail patients can only increase the patient experience. And reducing staff travel distance frees them up to do more value adding work.

Figure 8 - Quantitative Analysis: Intervention 1

Metric	Before	After	% Red'n
Travel distance (Patient)	90m	67m	25.9%
Number of process steps	17	11	35.3%
Numbers of value-added process steps	5	4	20.0%
% of Value-added process steps	29%	36%	—
Number of handoffs	4	3	25.0%
Number of queues	5	2	60.0%
Travel distance (staff)	170m	138m	18.6%

However the real measurement challenge will come as stated previously once the spread site build their endoscopy unit. This will create the opportunity to gather real data from a unit which will be used for considerable years into the future.

### 3.4 What has your project added to the discussion or evidence base for corporate and clinical teams working together in improvement?

Our project focused on the design of facilities. This is because we believe that design can have a significant impact on the efficiency and effectiveness of any healthcare system. A lack of clear communication and a narrow engagement focus can ultimately lead to unexceptional layouts. This is proving to be a particular problem as the demand for healthcare increases due to aging populations, poor lifestyle factors, and increasing complexity in the symptoms being presented.

**Our project has added the following points to consider when working with corporate and clinical teams:**

1. **Stakeholder engagement** - Larger stakeholder engagement events can help create richer design briefs, and this is important because decisions made at this stage impact on the final outcome. As a result we have demonstrated that 3P can be used in an NHS context to create an effective process for engaging with a wide range of stakeholders in order to improve the design brief.
2. **Systems thinking** - In order to create service configurations that facilitate efficient and effective operations it is important to stay true to the guiding Lean principles and analyse the system flows accordingly.
3. **Communication** - Working with both professional groups helps shed light on interactions between flows which may be overlooked in the traditional design process.
4. **Multi-functional teams** – It is possible to widen ones perspectives by participating in a multi-functional team. We had examples of clinicians gaining added awareness of the whole system in endoscopy.

Finally we believe that the replication of our process in another hospital trust, as well as in another unit within the host trust, demonstrates that the results have practical application when it comes to working with corporate and clinical teams.

## Section 4

# Learning and Challenges



“We all thought it couldn’t be done – a design from start to finish in five days. But it was amazing how quickly we were able to start creating prototypes and testing flows.”

Matron



“The 3P workshop helped the architects learn about what the hospital really needed. One commented to me that they got more done in one day than is typically the case in six months.”

Improvement Facilitator



presents typical responses reported by stakeholders starting with perspectives before the event towards the left of the figure moving towards changed perspectives on the right. Typically, before the event has taken place we see responses such as “uncertainty”, “anticipation” or even “cynical” and “suspicious”. As the event unfolds we start to see perspectives and feelings change towards, for example, “curiosity”, “different than imagined” and “get involved”. By the end of the event we see more positive response and a strong emphasis on “team working” towards achieving a practical outcome.

The knowledge captured shown here is from the endoscopy spread event held with CHS but responses are in line with observations and responses from the pilot workshops. We have also collected data via interview and focus group with workshop delegates as part of our evaluation work.

We learned that as a core project group we had experienced a similar journey to our Lean 3P design event delegates. There was a lot of uncertainty during the setup phase - would we get a partner organisation to offer a site to run the pilot intervention? Would the clinical team be “welcoming” or “blockers” due to previous experiences with service improvement? As we moved to the beginning of the implementation phase we began to get more curious about how it would really be - as there is often a huge difference between how things work theoretically and how they work in reality. There is also a difference in terms of facilitating, say, a one day workshop event and taking responsibility for leading an innovative, and largely untested, approach to designing a £7 million healthcare facility. Just as the participants in our 3P workshops began to feel “apprehension due to the size of the event” as to did we as a wider project group. However, as the implementation phase draws to a close, we are motivated to further test the process at a larger scale due to the positive feedback we have received from participants. However, in the future particular emphasis will be placed on data and its analysis relating to the functional content of the facilities to be designed. This is an area which we have observed can act as a barrier to both change and progress throughout the course of the project.

#### 4.2 What were the unintended consequences and side effects of your project?

Our project plan intended originally that we would complete two pilot interventions during the implementation phase. The first one taking place late in 2013 and the subsequent one taking place much later in 2014. This was to ensure that a great deal of learning and refinement of the approach could take place between these two pilots. As we enacted our plan we responded to opportunities that arose and so four interventions took place. These comprised of two endoscopy units, a maternity unit and a paediatric clinic. A key driver of this was the informal communication networks that exist within a hospital but more interestingly between hospitals in the same region.

We have also heard back from an external architectural practice that they have altered their approach since participating in an event. Though this was unintended but it arguably could have been expected.

One of the primary goals of the Shared Purpose programme was to create a mechanism for clinical and corporate service teams to work together more effectively. Whilst we believed we would be able to achieve this when planning our programme, we have been surprised and

delighted by just how successful it has been. We've had people from different departments talk to us about how it has "made their lives easier" and they are no longer going into meetings "defensively". Working together in this way has created better interpersonal team dynamics from different departments.

Whilst we cannot recall any major negative unintended consequence, we have the concern our approach may be applied incorrectly and do it an injustice. Though this is something that may happen over time, we must accept that there is probably little that can be done about it.

From a facilitators point of view we were blown away by just how real the designs had become in the minds of the clinicians. They could easily reel off all the intricate details of their new unit before any architect had put pen to paper. This is a great result that we found very energising though may need to be experienced personally to fully appreciate it.

#### 4.3 Advice for others attempting to replicate our work in another organisation or setting

It is essential to ensure there is strategic alignment when it comes to project selection. It is very important that the quality improvement work is seen as part of the strategy and not simply something bolted on to the side. The board needs be clear on priorities and then target resources to help achieve whatever these priorities are.

The approach our project used is considered an advanced Lean practice and so we would not advise beginners to attempt it without support. When working with teams of thirty plus people for up to five days, it's important to keep the destination in mind whilst remaining flexible on how you get there. This can make people feel very uncomfortable. Also, the timelines for an estates or facilities project are probably much longer than we are used to. This is something which needs to be considered and planned for. Most importantly don't beat yourself up along the way just because things may take a little longer than expected.

In order to ensure that you are setting yourself up to successfully measure the effects of your intervention you should ensure that you gather adequate baseline data. This can be a big challenge particularly when it comes to getting corporate support services and clinicians to be open with each other. This goes back to the importance of building productive relationships between these two parties. Only then will you be able to really come together and impact on patient care. Otherwise it will simply be a barrier which will directly impact on your success or failure.

Finally the three most important things from a go/no go perspective are that you need to know the following going into the event:

1. The schedule of accommodation;
2. The available floor space;
3. And ensuring that you thoroughly consider the complexity of the system, which will drive the approach to planning intervention(s).

Without sufficient insight into these there is little point starting - which is something we have come to appreciate as the project evolved.

#### 4.4 Reflections on how change happens, new models of care and evaluating complex change

For us it was really interesting to work across a number of professional groups. It allowed us to form an idea on how we feel change happens, ideas for working with new models of care, and most interestingly it confirmed our belief that evaluating complex change requires something more than a simplistic copy and paste approach. Further thoughts and ideas are included below:

- 1. How change happens** – Our project used a highly participative approach. And one of our hypotheses is that this helped create a sense of belonging. This then allowed participants to fully take part and immerse themselves in what was happening. This was true across all design interventions. Based on this it is our belief that change happens more readily when people believe that they have a real chance to shape their way of working in the future.
- 2. New models of care** – With any change programme it is always important to gather baseline data, and this is even more through for a facilities design project. This should include a thorough understanding of the current model of care. It was this initial baselining activity that allowed us to explore the possibilities of introducing change, and new ways of delivering care within the teams we worked with.

For example, with both endoscopy teams we noticed that there was a significant number of hand-offs and patient travel where essentially no value added activity was being delivered. We made further discoveries by analysing the relationships between multiple flows in care procedures. This led to the creation of a point-of-delivery (POD) based system which not only reduced the waste in the process, but more importantly increased the privacy and dignity of the patients using the service by bringing care to them. In maternity the same process allowed us to facilitate the creation of a “wrap-around” model where care was pulled to expectant mothers as acuity needs changed. Again without looking at each step and asking “how can we do this differently in the future” a new model of care wouldn’t have been created.

- 3. Evaluating complex change** – Evaluation played an important part in our project, and looking back we are glad we took a dual approach to evaluating our work. When you combine the large number of people we engaged with, and the outputs they created (blueprints) it would have been easier to either focus mainly on the qualitative or quantitative aspects respectively. However we decided to use “strategy as practice” to evaluate the interpersonal and qualitative side to the work, whilst we used an adaptation of systematic layout planning to quantitatively evaluate the changes to healthcare flows. It is based on this experience that we believe complex change requires a multidisciplinary approach using both quantitative and qualitative methods (for more information on the evaluation please see: *NETS LDoS Final Evaluation Report*).

## Section 5

# Embed and Spread



“Lean design has been talked about in architects’ offices for years. But there’s not been enough emphasis placed on it. Through being involved in this project, we’re now using Lean thinking much more than we have done before.”

Architect



“Comprehensively, universally, we would not have got to the final design without this process. You get everybody’s opinion, people actually understanding, getting hands on and engaged, and so you get the best design at the end.”

Consultant

## 5.0 Embed and Spread

### 5.1 In what ways has your intervention been sustained?

We are confident that our intervention will be sustained in the host organisation. We can already see evidence of it spreading and most interestingly being adapted by the estates and facilities teams we worked with. The host organisation innately decided to use the approach they experienced in the pilot endoscopy site with a subsequent maternity redevelopment project. And they then used a mini version of the approach with a paediatrics clinic which they will be relocating to another area of the Trust. However it could have been sustained more. Trusts operate their estates strategy on a long term plan. This project came into place in the latter stages of the host organisation's estates strategy. Essentially it wasn't planned in - and nor could it have been seeing as the project didn't exist when the current long term strategy was created.

In reality we were rather fortunate, and it could be argued somewhat down to the success of the pilot site, that we were allowed in as a late addition. It is the same with the spread site but they too are looking forward to using the approach in subsequent projects later in 2015. Because we are facilitating the design of environments that will ultimately be built and most importantly used for anywhere between twenty to fifty years, of course the impacts of the interventions will be sustained and patients will benefit from increased privacy and dignity. We are not totally naïve however, and appreciate further innovations will occur which may replace some of the systems that we have helped create but that is fine and can perhaps only be expected when modern technology is rapidly increasing the rate of obsolescence.

To increase our chances of spreading our initiative, we believe that a spread model could work across three levels as depicted below. The first level emphasises the innovative pilot work within our host trust. The second level expands on replicating our approach regionally, whereas the third level focusses on national adoption.

#### 1. Pilot Site Spread

The pilot site has gone through three iterations of the process. The first two were led by the NETS team. However the third one, a hybrid approach, was led by the trusts own Estates team. We feel that they have adopted the approach and will use it on future capital development projects.

#### 2. Regional Spread

Our Lean facilities design approach has already spread beyond the host pilot organisation with the design of an endoscopy unit in Sunderland. Though early days, we have also had requests to support further design workshops in Sunderland. Based on this experience, we believe that there is great potential for regional adoption of the approach.

#### 3. National Spread

We have already had talks with interested groups beyond the North East and we believe that we might be able to take advantage of these connections in order to spread the process at greater scale.

## 5.2 What success have you had to date in spreading and publicising your work, and what are your future plans in this area?

In order to share innovative ideas it is important to publicise your work. We were always keen to publicise our project and the support we've received from The Health Foundation and have made an active effort to do so. In the beginning we had early successes with the Building Better Healthcare team. They interviewed our project manager and subsequently published an article online. This was followed up some months later with a case study on the first endoscopy team we worked with. Shortly after this our evaluation team travelled to Brazil to present the participative aspects of our project to an international audience.

As we began to work with more endoscopy units news of our project started to spread within that arena. Subsequently we were invited to deliver a full afternoon session at the British Society of Gastroenterology's annual conference in the summer of 2014. This allowed us to build on our earlier conference experience describing our approach to the Health Estates and Facilities Management Association (HefmA).

We have also been successful in having posters accepted for display at the International Forum on Quality and Safety in Healthcare. The first was presented in Paris in 2014 and the second in London in 2015. Our team also presented at two other conferences in Europe. This gave us the opportunity to mix with likeminded people. In Italy we presented preliminary findings from our early evaluation work to an international group of academics from the UK, Italy and Australia. On top of this we delivered a workshop in Hungary for the European Health Property Network which was well received. We also have had articles published in relevant magazines such as Industrial Engineer and HefmA Pulse - the former being an international publication based in the United States and the latter a key publication for Estates and Facilities professionals working in the NHS.

We were also visited by a group of delegates from Hong Kong. They work for the Hospital Health Authority of Hong Kong in the Kowloon region and are planning the building of a new hospital. These delegates came to visit us specifically to learn about how we have applied Lean to the design of our buildings.

Finally, we will be spreading our message at the International Forum on Quality and Safety in Healthcare in Gothenburg, Sweden in 2016. We have been asked to take part in an interactive group video session. The idea is that a group of teams will present short films based on their improvement work and, following the screening, engage with delegates to answer questions, and spend time with those are most keen to learn more about the project.

Figure 9 - Communications Spread



### 5.3 Resources

#### *Lean 3P Design Case Studies*

- Mini case study of pilot 1 (GHNT Endoscopy) [bit.ly/LDoS\\_C1](https://bit.ly/LDoS_C1)
- Mini case study of pilot 1 (GHNT Maternity) [bit.ly/LDoS\\_C2](https://bit.ly/LDoS_C2)
- Mini case study of pilot 1 (CHS Endoscopy) [bit.ly/LDoS\\_C3](https://bit.ly/LDoS_C3)

#### *Articles*

- Online article re LDoS project (Building Better Health Care 1) [bit.ly/LDoS\\_A1](https://bit.ly/LDoS_A1)
- Online article re LDoS project (Building Better Health Care 2) [bit.ly/LDoS\\_A2](https://bit.ly/LDoS_A2)
- Professional trade magazine article re LDoS project (HEFMA Pulse) [bit.ly/LDoS\\_A3](https://bit.ly/LDoS_A3)
- Online article re LDoS project (Planet Lean) [bit.ly/LDoS\\_A4](https://bit.ly/LDoS_A4)

#### *Videos*

- LDoS micro-site containing all video resources <https://vimeopro.com/nhsnets/ldos>

#### *Related Documents*

- NETS LDoS Final Report Appendix: This appendix provides a high level overview and day by day breakdown of activities used in the LDoS 3P. Every LDoS intervention was unique, but the course materials remained the same, and they have been included as part of this appendix.
- NETS LDoS Final Evaluation Report: This report brings together work carried out by the Programme Lead towards the completion of a PhD with external evaluation from academic partners. It provides a review of the literature on service-scapes, the design and construction of UK buildings, traditional hospital design, participatory design and 3P. It then presents a detailed evaluation of the project's pilot cases based on participant observation, an analysis of secondary data and interviews with selected participants.

© 2015 Gateshead Health NHS Foundation Trust

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, without prior written permission of the copyright owner. For queries please contact [Iain Smith](#), Head of the North East Transformation System.