THAMESLINK
LONDON BRIDGE AREA
PARTNERSHIP ASSESSMENT
An assessment of the outcomes and effectiveness of collaborative working in the planning and delivery of the scope of works for the London Bridge Area Partnership (Thameslink Programme)

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Jacobs would like to thank all of the managers (past and present) and staff from the partner organisations that make up LBAP for their time and valuable contributions to this report.
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Executive Summary

In December 2017 Jacobs were commissioned to undertake a review of the collaborative aspects of the planning, management and delivery of the Thameslink London Bridge Area Partnership works in Key Output 2 in order to produce a legacy document that will inform and inspire subsequent programmes of work.

To gather the required information, a series of seven workshops were held during January 2018 with a cross-section of key staff, both past and present, from all partner organisations. Workshop discussions were captured and reviewed and a number of recurring themes identified. This report considers each of those themes in turn, identifying where the collaborative approach taken had a positive effect as well as areas where further improvement or learning may be possible.

The individual findings detailed in the report are listed below by theme.

Theme 1 – Procurement/Commercial Strategy

- Collaborative Success Factors
  - Early development of the Delivery Strategy
  - Partnering model selected over Joint Venture or Alliance
  - Network Rail adopted leadership role
  - Adopted a positive approach towards incentivisation
  - Efforts made to ease issues with multiple specialists operating in a confined space
  - Collaborative capability assessed during procurement
  - Full supplier buy-in to model, programme and costs
  - Mature re-assessment of budgets and approach to ‘Re-Authorisation’
  - Effective and open change process
  - Risks placed where they could best be managed – ‘Risk Pots’
  - “Schedule is King”

- Potential Learning
  - Contract administration could be improved further
  - Enabling works contractor should be better integrated into the programme

Theme 2 – Early Contractor Involvement

- Collaborative Success Factors
  - Early engagement with suppliers
  - Comprehensive ‘Early Contractor Involvement’ agreement
  - Joint development of contract requirements
  - Integration of design with estimating
  - Development of a robust master schedule

- Potential Learning
  - Opportunity to involve ECI contractors in the statutory planning process
Theme 3 – Leadership, People and Behaviours

- Collaborative Success Factors
  - Bespoke organisation created with the best people
  - Aligned vision and values transferred to the teams
  - Culture of collaboration driven down from the top
  - Strong business relations and trust built on successful delivery
  - Single team ethos promoted with co-location and team branding
  - Collaborative project, collaborative staff
  - Significantly improved behaviours and ‘no blame’ culture
  - Signalling operating as lead discipline
  - Facilitated provision of timely support to the supply chain

- Potential Learning
  - Ensure suitability and size of accommodation to maximise co-location and performance
  - Some issues remain with site workers
  - Keep the team together as long as possible

Theme 4 – Collaborative Processes

- Collaborative Success Factors
  - Programmed fire-breaks
  - Robust application and adherence to GRIP
  - Team building events
  - Collaborative approach formalised
  - In-house Partnership Relationship Manager
  - Introduction of a ‘Construction Before AFC’ process
  - Surveyors and designers collaborating to improve performance
  - Ability to obtain and discharge own access
  - Effective management of site interfaces between principal contractors
  - Station Interface Manager
  - Collaborative approach to Section 106 requirements
  - Collaborating to ensure compliance with sustainability requirements
  - Engagement with passengers and with political and business stakeholders

- Potential Learning
  - Align design philosophies of Rail Systems and Civils Design teams
  - Develop more detailed arrangements for Collaborative 3D modelling
  - ‘Chainage’ versus ‘Absolute Global Position’

Theme 5 – Collaborative Forums

- Collaborative Success Factors
  - Governance structure: Management Board, ISB and DPF
  - Mature approach to change management
  - Multi-disciplinary design meetings
  - Station Project Working Group in place
  - War Room approach highly successful
  - Delivering Works Within Possessions and Brown Paper Bag meetings
  - Town Hall briefings held ahead of every major stage or blockade
  - Construction Logistics and Integrated Possession Planning

- Potential Learning
  - Arrangements for the Integrated Schedule Board require review
  - War Room resource requires consistent and appropriate level of experience
  - Effective Brown Paper Bag meetings require full engagement of all Partners

Theme 6 – Safety

- Collaborative Success Factors
  - Independent safety culture survey
  - Openness and sharing of best practice
  - Going beyond compliance
  - Willingness to change
  - Red and Yellow Cards
  - Directors’ Safety Group
  - Safety Leadership Team
  - Collaborative design of CDM strategy
  - Focus on ‘Significant Events’

- Potential Learning
  - Challenges in consistent application of policy with regard to Personal Protective Equipment
Key Success Factors

As can be seen above we have identified a large number of individual measures each of which has contributed to the success of the project through a collaborative approach. In the concluding section of the report we have highlighted what seem to be the most significant elements that really drove the success of the London Bridge Area project and that should be considered when setting up future projects; these are:

1. **Commercial model** – To enable and support collaboration
2. **Early contractor involvement** – With continuity through to delivery
3. **Bespoke organisation** – The right people for the job
4. **Collaborative Culture** – Driven down from the top / team building
5. **Aligned vision and objectives** – “Schedule is King”
6. **Constructive Challenge** – Working together in the right way
7. **Governance** – Good governance arrangements and flexibility to adapt
8. **Change Management & Collaborative Planning** – No surprises and buy in to the schedule
9. **The War Room** – Rigorous approach to management of possessions
10. **Safety** – Collaborative development of a mature approach to safety culture issues.
Key physical outputs of LBAP

In summary, the key physical outputs delivered through the KO2 LBAP programme were:

- Tanners Hill track doubling and renewed double junctions;
- South Bermondsey Turnback & Up Sussex Loop;
- New sub-station at London Bridge and new 11kV mini sub-station for signalling power;
- Complete rebuilding of London Bridge Station, 15 platforms, accommodation blocks, retail, urban realm, station control and customer services;
- 124 major track and signalling stages comprising:
  - 154 S&C Units and 42km of new track, 20km of new conductor rail;
  - 9 major signalling commissionings;
  - Improved maintenance facilities and improved safe access for staff;
  - A new enhanced telecommunications network for IP-based signalling;
  - New staff and vehicle access points throughout the London Bridge area;
  - Reconfigurable signalling power supplies and UPS throughout;
  - New points heating farms and distribution;
  - All critical assets connected to remote condition monitoring;
  - Systems ready for ATO/ETCS and traffic management.

Programme Benefits Achieved

The wider Thameslink Programme has enabled DfT to:

- Reduce overcrowding on Thameslink and other commuter services;
- Reduce overcrowding on London Underground;
- Reduce interchange between main line and LU services;
- Improve transport accessibility in South East England;
- Facilitate passenger flows at St Pancras International.
KO2 Staging Sequence Schematic
Introduction

Thameslink Programme

This Government-sponsored £7bn Programme is an ambitious ten year programme of extensive infrastructure enhancements and the delivery of 115 new trains that will bring faster, more frequent, more reliable, better connected journeys for passengers - transforming north-south travel through London.

The Programme is delivering new infrastructure, better stations, new technology and new trains on an expanded Thameslink network to deliver significant improvements that respond to the growth in passenger demand now and into the future.

‘The Thameslink Route’ is the designation for the railway that runs from Bedford to Brighton. The Thameslink Route is the designation for the railway that runs from Bedford to Brighton and is the only route that has direct, unbroken north-south connectivity through central London. Prior to the commencement of the Thameslink Programme (TLP), Thameslink had significant capacity constraints being restricted to trains at 8 car length. The route had numerous junction bottlenecks, which limited the frequency at which its services could operate through the central London core section.

The purpose of TLP, undertaken on behalf of the DfT, was to unlock these constraints, increase the range of destinations served and provide a step change and provide a step change in capacity thus providing significant congestion relief and capacity for future growth in passenger demand on Network Rail and London Underground services, in line with the DfT’s strategic objectives shown below.

DfT Strategic Objectives

TLP can be summarised into the following enhancement packages of works:

- Upgrade of the railway to enable 12 car trains to run on Thameslink routes, increasing from the current 8 car train capacity;
- Delivery of the functionality to be able to increase the frequency of trains from 8 to 24 trains per hour running through the centre of London, known as the ‘core’; and
- Refurbishment and redevelopment of stations along the Thameslink route and in central London: Blackfriars, Farringdon and most significantly London Bridge.

The outcome of these works will be increased capacity through the core, with the capability for more frequent and higher capacity trains over specified sections of the route. In order to carry out these improvements, TLP was split into three distinct benefit tranches known as ‘Key Outputs’:

- Key Output 0 (KO0) – To increase from 8 to 15 peak train paths per hour between Blackfriars and St Pancras and associated enabling works to facilitate the delivery of subsequent Key Outputs. This was completed in March 2009;
- Key Output 1 (KO1) – To allow 12 car operation between Bedford and Brighton by 10th December 2011 and to deliver new infrastructure capability by 10 April 2012 to enable the new Key Output 1 Timetable to be introduced in May 2012. This has been achieved; and
- Key Output 2 (KO2) – To provide the completed Thameslink service giving a further improved train service of up to 24 peak train paths per hour through the central London ‘core area’ by December 2018.

This review focuses on Key Output 2.
The London Bridge Area Partnership (LBAP) was created in order to facilitate delivery of the central London or “core area” works and consists of the client (Network Rail) and three key delivery partners, Costain, Siemens Rail Automation and Balfour Beatty (Skanska were also employed to deliver works at Bermondsey). Its scope of works included:

- Redesign and construction of London Bridge Station including new through platforms and enlarged concourse;
- Re-signalling, update of traction power supply and telecoms on the remodelled track layout at London Bridge Station;
- Installation of signalling and track on the new Borough Viaduct (delivered during KO1);
- A new dive-under at Bermondsey to separate train services; and
- A Structure Strengthening Programme on the approach to London Bridge in line with the proposed track re-alignment.

Key NR objectives for LBAP were summarised as follows:

- To deliver the project safely, so that everyone gets home SAFE everyday.
- To leave behind a railway structure fit for the 21st Century.
- To develop teams capable of meeting the needs of the railway.
- To serve as an example to other rail projects.
- To deliver value for money.
- To have a positive impact in the communities we serve and work in.
- To undertake and deliver the project in accordance with the industry agreed staging and access plan.
- To provide appointed delivery partners with the ability to enhance their returns through successful collective performance.
- To undertake the project in a collaborative manner that facilitates the enhancement of the relationship between the parties and the reputation of all.

These objectives were captured in the TLP Statement of Intent.

Over the past 6 years the LBAP has delivered the major civil and rail infrastructure works included within the scope. The bulk of these works concluded in January 2018 when the fully remodelled London Bridge station re-opened.

**Collaboration**

The permanent and temporary works involved were complex and highly interdependent, particularly as they had to be undertaken whilst continuing to operate an intensive railway service through and around London Bridge station. As a result of these operational restrictions, compliance with the planned disruptive access arrangements was of critical significance to Network Rail (NR).

Therefore, NR required that, in addition to the contractual arrangements between the parties, the organisations that constitute LBAP should work collaboratively, under the auspices of BS11000 (British Standard for Collaborative Business Relationships). This aligned with the guidance provided by the McNulty Report and CP5 and was intended to promote the efficient and effective management of interfaces and generate efficiencies or enhanced value between the station and infrastructure works packages.
Factors influencing collaborative working (from LBAP RMP)

The principles of collaborative working were initially incorporated into a Corporate Relationship Management Plan (CRMP). This was revised in 2012 into a Project Relationship Management Plan (PRMP), agreed by the Partnership and the project was formally awarded the British Standard BS11000 for Collaborative Business Relationships.

The Partnership comprises Network Rail, the delivery partner undertaking the station works – Costain Ltd, the delivery partner providing the track and minor associated civils works - Balfour Beatty Rail Ltd, and the delivery partner providing the signalling works - Siemens Rail Automation Ltd (SRAL).

External to LBAP, but still within the boundaries of the London Bridge Area Redevelopment Project, the Bermondsey ‘Dive Under’ structural works were carried out by Skanska Construction UK Ltd, which due to their timing and levels of geographical and organisational interface could have had a significant impact upon the success of the LBAP. Therefore, Skanska participated in the partnering activities of the LBAP with the exception of the incentive arrangements.

From a contractual perspective, the objective of the Partnership was to deliver the infrastructure works in the London Bridge area by applying the Partnering Principles as set out in the contracts. These principles required that, once selected, each of the delivery partners work together in a spirit of collaboration, mutual trust and cooperation in order to:

- Deliver the works safely;
- Use and share innovative methods to deliver the works;
- Achieve effective interfacing in all areas of work and with the supply chain in order to eliminate duplication and inefficiency;
- Strive constantly for continuous improvements in all areas within the Partnership;
- Share and mitigate the risks and liabilities associated with the interface operations;
- Introduce and apply innovative methods of delivering the London Bridge area, particularly in relation to the interface between the different teams and the sharing of resource, equipment and knowledge;
- Identify and implement potential savings and benefits to the Partnership;
- Acknowledging that there is a duty to alert each of the other delivery partners of any potential or actual failure to comply with the Partnering Principles and/or any contractual obligations; and
- Be known and/or acknowledged within the rail industry as an example and role model of a successful multi-party Partnering Arrangement.

Essentially, the delivery partners were required to be aligned in delivering the works (with a dominant focus on key factors such as quality, time, cost, and value) and in facilitating the effectiveness of the collaboration, whilst still meeting the objectives of the overall programme, as shown in the graphic below:
In December 2017 Jacobs were commissioned to undertake a review of the collaborative aspects of the planning, management and delivery of the LBAP works in Key Output 2 in order to produce a legacy document that will inform and inspire subsequent programmes of work.

This review included an assessment of the outcomes and effectiveness of the deployment of collaborative working in the planning and delivery of the scope of works for the London Bridge Area Partnership (Thameslink Programme) and has drawn conclusions as to where the London Bridge Area Partnership succeeded in its aspirations to use collaborative working and where there were opportunities for improvement, based on the experiences of the key people involved in the works.

Methodology

Two meetings were held with Network Rail and representatives of the Partnership during December 2017 to confirm the scope of the review, workshop topics, attendees and logistics.

A series of seven workshops were then held with key staff from all partner organisations during January 2018 as outlined below:

<table>
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<tr>
<th>Workshop</th>
<th>Date</th>
<th>Focus areas included</th>
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<tr>
<td>Commercial Enablers</td>
<td>09/01</td>
<td>Commercial strategy, supplier strategy, procurement strategy, BS11000, delivery strategy.</td>
</tr>
<tr>
<td>Technical Enablers</td>
<td>09/01</td>
<td>Staging Strategy, integration with estimating, buy-in from delivery partners, process integration and variation, forums, oversight and assurance, change, ECI, resource planning, design strategy, reference design.</td>
</tr>
<tr>
<td>High Level Management</td>
<td>11/01</td>
<td>Strategic planning, works planning and interfaces, management systems and oversight.</td>
</tr>
<tr>
<td>Management of Design</td>
<td>17/01</td>
<td>Surveying, use of NR in-house design group, design integration, supplier, capability/capacity.</td>
</tr>
<tr>
<td>Interfaces between Rail Systems, Buildings and Civils</td>
<td>23/01</td>
<td>Access, construction management, site interfaces, physical interfaces, site security, site management, culture and behaviours on site, WAR Room, site reporting, DWWP, safety on site, station operation, station delivery, communication.</td>
</tr>
<tr>
<td>Relationship between NR and Costain</td>
<td>24/01</td>
<td></td>
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<tr>
<td>Relationship b/w NR, Siemens and Balfour Beatty on Rail Systems</td>
<td>30/01</td>
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Workshops varied in length from 2 - 4.5 hours each.
During each session attendees were asked to consider how the collaborative arrangements put in place had helped ensure successful delivery of KO2, and to identify any possible weaknesses or areas where scope for improvement remains. Workshop discussions were captured and reviewed and a number of recurring themes identified. This report considers each of those themes in turn, identifying where the collaborative approach taken had a positive effect as well as areas where further improvement or learning may be possible.

**Deliverables**

1) LBAP Assessment Report

2) Summary document of the collaborative relationship

3) Presentation to LBAP Directors Meeting on 26th February 2018
THEME 1 Procurement/Commercial Strategy

Background Information

- Sir Roy McNulty's 'Rail Value for Money' study, published in May 2011, identified greater collaboration between organisations in the industry as one of the means for delivering greater value for passengers and tax payers.
- Due to contract award timing, Bermondsey Dive Under (BDU) was built by Skanska as a separate civils structure and not managed as an integrated part of the programme.

Success Factors

- Early development of Delivery Strategy
  During the early part of GRIP 3 the concept of a delivery strategy was developed which in turn drove the creation of the three separate works packages (track, signalling and station). All three contracts started on the same day, with same pre-construction phase and same pre-construction phase outputs.

- Partnering model selected over Joint Venture or Alliance
  In KO1 the JV structure had proven cumbersome (with NR negotiating with two partners) and led to slow and cumbersome decision-making. In order to successfully adhere to the programme, a model was required for KO2 that would facilitate prompt decision-making. NR had to own it and drive the programme itself.

  KO2 needed strong leadership and behavioural requirements and so NR decided it would accept a higher level of risk in certain areas than had previously been the case on other projects in order to support a more collaborative approach. These areas included: track access, possession management, systems integration and overall approvals. With NR in the Programme Manager role it was decided that there was insufficient benefit in adopting an alliance model. Instead NR drew up its own contract which was a blend of ICE Target Cost and ECC Option X12 to give a set of provisions consistent for all three Partners (Clause 90). Partnering level and risk and reward arrangements would be consistent across all three contracts. If the partnering arrangements failed, contracts were set up in such a way that the programme could continue with NR reverting to the role of a more traditional client, whereas an alliance would have to collapse entirely.

- NR adopted leadership role
  The fundamental leadership dynamic was to come from NR who wished to retain the leadership role but wanted a formal collaborative environment and approach on KO2. NR also firmly believed that it possessed significant management and leadership capabilities to assume this role.

- Adopted a positive approach towards incentivisation
  NR adopted a positive approach towards incentivisation. Previous experience had shown that being more confrontational in this area has negative overall impacts. In order to discourage protective behaviours, NR endeavoured to be realistic with regards to risk transfer and committed to pay all costs, but specified that as contractors’ costs increased so fees would decrease.

  NR wanted a simple transparent system for incentivisation of Partners that would give all three partner organisations the opportunity to succeed if they worked together. If one failed all would fail. NR could adjust and write back bonus payments at any point in the future for a number of reasons: safety/environment, 3rd party disruption, train operator disruption, overall operational performance. Bonus payments to Partners were discretionary and geared to the successful completion of stages. The value of each bonus was linked to the importance of the stage and applied equally to all Partners.

  The Partners embraced this new approach, even agreeing on occasion to put margin and bonuses at risk as part of the incentivisation process.

  With regard to contractors, a Contractor Profit Payment was put in place whereby 50% of their profit was put at risk around performance of the stage. If at any point a contractor failed they could, however, catch up to programme and recover all lost bonuses. There was some reluctance to the use of disincentives as it was felt it would sour relationships.
Ultimately, LBAP used a target cost model together with a mechanism to turn off pain fairly quickly, thus discouraging contractors from adopting adversarial behaviours. As a result, contractors’ balance sheets were less exposed, facilitating the opportunity to create a more open and collaborative working environment between Partners.

**Efforts made to ease issues with multiple specialists operating in a confined space**
The station, track and signalling specialist contractors were all going to be working within very close proximity. For this to succeed, a mechanism was required by which they would actively co-operate. NR considered procurement options including single source, but wanted specialists for each role. It was clearly not possible to get sufficient space between contractors to allow them to operate independently and so the adoption of a collaborative approach offered a solution.

**Collaborative capability assessed during procurement**
The procurement of contractors focussed primarily upon technical capability but did include an assessment of organisational maturity and collaborative capability which attracted a weighting of 16%.

**Full supplier buy-in to model, programme and costs**
NR actively sought out the experience of other infrastructure clients (Highways England, British Airports Authority and National Grid) around ECI and incentivisation. They held workshop sessions with a range of major contractors to seek their views on ECI and their experience of incentivisation with other clients and industry sectors.

Significant time was spent working with senior management in the supply chain to get buy in. Good relations and rapport were developed as they bought into the concept. By the time NR went to get approval to deliver KO2 they had full supplier buy in to the contract, programme and costs. The target price contract model had been discussed in detail by all Partners and agreed in advance.

**Mature re-assessment of budgets and approach to ‘Re-Authorisation’**
It is understood that at the outset there was an under-estimation of cost and risks. LBAP’s collaborative arrangements enabled a more mature approach to the re-assessment of budgets and risk allowances by each element of the programme and each supplier/contractor. NR engaged the contractors in this opportunity, enabling them to come forward openly and honestly to identify the full costs required to deliver the programme. The job was then completely re-forecasted.

In turn, this enabled NR to return to DfT for a single re-authorisation exercise rather than going back repeatedly, as had been the case on some earlier NR projects.

Contractors felt this reflected a new positive attitude and approach on the part of NR and believe it to have been radically different and beneficial to programme delivery. In their view, NR was behaving as a more mature client than seen on other rail projects. Contractors felt empowered to provide NR with the full picture whilst protecting the schedule.

During this same period, a number of processes and procedures were re-written in collaboration with Partners. The existing NR directives offered only general principles, so effort was put into enhancing and tailoring these to suit the particular requirements for this complex project.

**Effective and open change process**
The documented change process included an open forum with all delivery Partners involved, thus avoiding any hidden agenda. Change Boards met on a regular basis and were well attended. This successful approach to managing change mean that “contracts were left in the bottom drawer and stayed there.” Change is discussed in more detail in Theme 5 – Collaborative Forums.

**Risks placed where they could best be managed – ‘Risk Pots’**
This was a difficult project to deliver and so bigger risk items were retained by NR and the remaining risks were placed where they could best be managed and left in the ‘risk pot’ of the appropriate contractor.

Although this approach is fairly standard for target cost it was unusual for NR, whose approach had tended in the past to be more adversarial. NR realised at the outset that taking an adversarial approach would not work and avoided it, even when they knew costs were escalating. NR and contractors applied risk management properly, with funds moved around as appropriate.
• **“Schedule is King”**

There was a recognition that programme delays would significantly damage NR’s reputation, particularly given the high profile of this particular project and the level of stakeholder interest in it. Access restrictions meant that missing a single milestone could lead to one year’s delay and significant additional costs. The view was taken that the overall cost of additional funding to stay on programme was cheaper and preferable to the reputational damage that would otherwise occur. Therefore, a conscious decision was taken to develop a model where, in effect, keeping to schedule became more important than cost.

**Potential Learning**

• **Contract administration could be improved further**

Collaboration requires open and honest discussions around performance. It would appear that, at the outset, NR was culturally not mature enough in this area with some project management staff reluctant to ‘rock the boat’ by serving a notice on a supplier. There was, therefore, an acceptance that some contract administration by NR has not been as good as it might have been.

• **Enabling works contractor should be better integrated into the programme**

The Enabling Works Contractor was the least integrated and this caused issues. Information integration was a key issue. This will recur on all projects. Need a way to incentivise/maximise performance to help others later. Improve handover process definition before start. E.g. including requirements about entry of information into BIM.
 THEME 2 Early Contractor Involvement

Background Information

- More focus was placed on Early Contractor Involvement (ECI) for KO2 than for KO1 where it was not thought to have worked as well as it could have. On KO1 the contractors involved in ECI were not retained to deliver the project which was re-tendered. With the benefit of hindsight this was viewed as delivering little benefit with the loss of six months to the programme. On KO2 there was a commitment that if contractors delivered ECI well they would stay on to build the project.

- ECI was carried out before the formal completion of GRIP 4.

Success Factors

- Early engagement with suppliers
  NR began to engage suppliers during GRIP 4 which is considerably earlier than usual. The supply chain gave NR a view of the project grounded in realism and allowed rigorous checking of the strategy. This proved to be a good enabler for ECI.

- Comprehensive ECI agreement
  The ECI agreement was very comprehensive and the suppliers’ proposals for ECI included named people and key staff who sat with the client and worked through the design together. ECI enabled a check of the reference specification to ensure constructability and deliverability. This removed a range of potential issues from GRIP 5 in advance and meant the Partners had a clear view as to how NR wanted Thameslink to work.

- Joint development of contract requirements
  The contract requirements (technical) were developed jointly by the Partners; this resulted in far fewer (or even zero) qualifications in the tender responses. Joint workshops were used to cross-check the technical specification and work through it in detail in order that the right scope was developed for each contract package.

- Integration of design with estimating
  The integration of design with estimating was undertaken earlier than usual during ECI, so suppliers knew and understood the scale and complexity of the challenges to be faced. The full involvement of estimators and schedulers enabled development of a believable price and programme that suppliers could buy into and DfT could have confidence in. Due to the scale and complexity of the project dedicated resources were provided for this purpose.

- Development of a robust master schedule
  The master schedule was very robust as key delivery partners were in place during ECI and detailed work on constructability was undertaken then. A series of events were held to go through the staging strategy to ensure that all Partners were fully engaged in its development and supportive of its content. This meant that a significant level of detail was in place in advance of starting the detailed programming process. The vast majority of the schedule planned in ECI stood up to the test of time.

Potential Learning

- Opportunity to involve ECI contractors in statutory planning process
  The timing of ECI meant that the Partners had limited opportunity to influence the planning application for the station as far as buildability was concerned. It would have been a positive step to have brought them in earlier in the planning process as it could potentially have led to fewer changes later in the programme.
THEME 3  Leadership, People and Behaviours

Background Information

• Original leadership on the project was behaviourally well-suited to successfully deliver the initial strategic project development elements. Once this early work had been completed, personnel changes at senior management level allowed a significant cultural shift towards a more openly collaborative approach, alongside modifications to the incentivisation model within the contract. This allowed the supply chain to be fully transparent about their costs and facilitated the re-authorisation of additional funding for the project which was key to delivering within the programme.

• The decision to use an in-house signalling design team was driven by lack of available resource in the supply chain. This was seen as important risk mitigation and gave NR increased capability to design the staging strategy.

• The basic organisational shape for delivery of the project consisted of a matrix approach (function-based vertical teams with services such as sustainability, safety and risk fed in from the side).

Success Factors

• Bespoke organisation created with the best people

In a direct response to lessons learnt on KO1, NR reached back inside the business to put together a totally new organisation to deliver KO2, including leadership and key posts. Given the prestige and the challenges associated with the programme, it was possible to attract the very best people. A bespoke NR team was therefore put together with the best individuals from across the country.

Major Programme Director, Thameslink (Jim Crawford) was appointed due to his detailed understanding of track and signalling, his knowledge of London Bridge Station and his ability to access and maximise the best skills and capabilities within NR. He led the development of the staging strategy with an appropriately skilled in-house team. The thinking and development of the strategy was carried out by “good, experienced rail people” who had strong technical capability and detailed knowledge of staging strategies as well as having an understanding of the station and how it worked.

A key feature of the approach to building the team was the ear-marking of individuals very early, not just the roles required. People were drawn in from core NR teams initially and then advertising was used to recruit people for the main works.

As a direct result, the quality of the staff engaged on the project was higher and more consistent when compared to other projects and there were fewer barriers/blockers to working together effectively. A number of people expressed the view that this was the best project team that they had worked with. This built a level of confidence that team members could rely on others to deliver on their commitments.

• Aligned vision and values transferred to the teams

Many attendees talked about how important the development of an aligned vision and values has been on the project. It did not matter who you were employed by, instead being the “right person for the job” was key. This message was driven down from the top. Care was taken to ensure clear lines of ultimate accountability and a single point of design responsibility. This enabled challenge without confrontation.

• Culture of collaboration driven down from the top

A vision and culture of collaboration was driven down consistently from the top throughout the project. Workshop attendees stressed that this approach was clearly different to that experienced on other schemes.

• Strong relations and trust built on successful delivery

The relationships and trust that were built during the first 3 years of KO2 teams made it easier to manage the challenges of the even tougher 18-months or two years at the end of the programme. This was identified as a key success factor. The team was kept together as much as possible and a culture was built on the successful delivery of each stage. For example, successful delivery at Tanners Hill between Balfour Beatty and Siemens built confidence and the teams matured, becoming very supportive of one another with NR leading and driving onward.
• Single team ethos promoted with co-location and team branding
The office layout was good, with teams genuinely integrated and a single London Bridge badge for all. This degree of integration meant that when big change items came up, the teams could discuss amongst themselves and resolve or ensure that all implications were fully understood before going for decision at the Strategic Change Panel.

• Collaborative project, collaborative staff
Whilst the senior management of partner organisations were not necessarily selected to fit such a collaborative environment, people who couldn’t work this way (at whatever level) were gradually replaced over time and the remainder stayed consistently giving continuity which helped tremendously.

• Significantly improved behaviours and ‘no blame’ culture
On a number of occasions in workshops, attendees from partner organisation stated that the behaviours and culture on LBAP are “totally different and vastly better” when compared to other NR projects they have been involved with over the years.

One of the key differences identified between this and other projects was the ‘no-blame’ culture that is in place. There was a strong feeling that everyone is in it together and they will succeed or fail as one. The clear expectation was that problems should be solved together with everyone helping each other out and rarely any reference back to the contracts. Instead Partners have picked up the phone or got round the table to sort out issues. There has been a clear, non-adversarial and highly collaborative approach. The clarity of this message and its repetition across all workshops was striking and indicated a clarity of purpose and strong desire to work together and deliver successfully.

• Signals operating as lead discipline
The biggest contributory factor to LBAP was the increased capacity for train services which in essence was driven by the new signalling layout. It was therefore determined that the Signalling team would act as the lead discipline in the works.

• Facilitated provision of timely support to the supply chain
The provision of timely support to suppliers was made easier in this collaborative environment. Support was offered on a regular basis and suppliers were more willing and open to come and ask and accept the opportunity to learn. There was an exchange of knowledge both ways. Closer working arrangements also enabled NR to make quicker decisions. This meant it was easier to manage problems with assurance, which saved time and money.

Potential Learning

• Ensure suitability and size of accommodation to maximise co-location and performance
Some workshop attendees expressed concern at the size and quality of the accommodation provided for co-located teams. It is understood that it had not been possible to co-locate the Utility Team as the offices at Beasley House were not big enough. The view was that co-location of all teams would have further increased performance.

Rail Systems’ integration in the team was vital and this was diminished once they moved to New Cross Gate (NXG), leading to declined effectiveness. It is understood that Rail Systems moved out in order to be close to the construction teams based at NXG (as there was insufficient room to accommodate all at James Forbes House). Signalling, track and civils were moved to New Cross Gate.
• **Some issues remain with site workers**
  - Relations at supervisory management level could have been developed further in order to avoid problems. At higher levels in LBAP it was good, but lower levels still experienced some issues.
  - An industry-wide problem exists with weekend blockades where you tend to receive the poorest quality, transient site workers who are brought in as required and therefore also tend to demonstrate the poorest behaviours. NR is not able to provide enough work for the contractor to retain a fixed team on a project and so sometimes agency staff are brought in by the contractor. It was suggested that there may be a way to resolve this issue by sharing some station team contractor staff (or other employed teams from other disciplines, organisations or even industries) and using them over the weekend. It was thought that this sort of approach may be feasible and could facilitate the required cultural change, improving behaviours and performance.
  - New arrivals on site (both NR and Costain) would have benefitted from an improved on-boarding process. No overall collaborative project induction process was in place, although the usual ones were there such as safety etc. It was suggested that site workers may also have benefitted from a regular one-page newsletter on what behaviours are acceptable in order to keep pushing the message out onto site, especially where changes to rules have been introduced for example.

• **Keep the team together as long as possible**
  As the end of the programme nears, so the team inevitably begins to break up, with people moving on to their next projects. This can cause some issues with behaviours altering once again. To date strong team members have been able to hold things together due to the really strong relationships that have been formed.
THEME 4 Collaborative Processes

Background Information

• **Programmed fire-breaks**
  Programmed ‘fire-breaks’ are possessions booked without major works in order to facilitate re-sequencing if required. These were usually booked on Bank Holidays. If the possession was not required for key LBAP works, it was always used for something worthwhile, even in some cases maintenance work.

• **Robust application and adherence to GRIP**
  LB followed the GRIP process rigorously with mandated stage gates etc.

Success Factors

• **Team building events**
  A series of team-building events were held to help create a common culture. This engendered good buy-in from the Partners and enabled a clear understanding of common goals and objectives and the challenges posed by the programme’s complexity and risks. The events were held over two days with an overnight stay and focused on manageable elements of the project. This reflected a deliberate managerial decision to put resources and time into building a genuine collaborative base for the project.

• **Collaborative approach formalised**
  BS11000 became a standard around 2012 and Network Rail was the first organisation within the rail sector to implement and gain certification. The company adopted the standard as a framework for developing the policies and processes, culture and behaviours required to drive continual improvement with key suppliers. The LBAP programme was the first NR programme to apply for independent BS11000 certification and all the Partners were consulted and actively engaged in the process. As LBAP had already been created a certain amount of retro-fitting and re-writing of key documents had to take place to achieve this and accreditation was valued more as a test than as a guide. The key value proposition of the certification was that it would be a mitigation against over-running.

• **In-house ‘Partnership Relationship Manager’**
  This is the first time NR has appointed an in-house Partnership Relationship Manager who has been dedicated full-time to the programme. This dedicated resource enabled the relationships between Partners to be strengthened and drove maximum value from the collaborative approach. Relationships were measured every 6 months with CAT surveys (Collaborative Assessment Tool) looking at management, leadership, empowerment etc. Dashboards were developed for the Management Board and for the Delivery Partners Forum (DPF) with both leading and trailing indicators.

• **Introduction of a ‘Construction Before AFC’ process**
  Traditionally, some work often starts before Approval for Construction (AFC) has been signed off. On London Bridge, because the project was high risk and was being closely scrutinised this could not be allowed to happen until a design was fully approved and therefore properly integrated. Some unapproved construction did occur initially, but this was stopped and a new process put in place to manage it referred to as the CBA or Construction Before AFC process. CBA allowed low risk construction to commence prior to AFC but not higher risk works. This formalised approach allowed early construction to take place in a risk assessed, managed way rather than potentially driving it out of sight.

• **Surveyors and designers collaborating to improve performance**
  A formal Survey Collaboration Agreement was developed for LBAP and signed by all the Partners. It covered surveying principles including standards, grid, sharing, co-ordination and tracking. The process identified duplication and early needs and £2m savings and £800k missed opportunities were identified. Surveyors and designers held a joint session in the station, so that designers could show surveyors what they needed to get accuracy in terms of setting out points. This improved the quality of outputs, leading to better information being entered into the 3D model making it easier to produce accurate designs.
• **Ability to obtain and discharge own access**

LBAP had the resources to obtain and discharge its own access and this was seen as a key enabler for delivery. The key to the success of this approach was the development of a close working relationship with Routes and TOCs. There is no shortcut to this collaborative approach with trust and respect having to be built up through the repeated successful delivery of possessions.

• **Effective management of site interfaces between principal contractors**

Some issues around site interfaces between the principal contractors were experienced early in the project. These were largely attributed to poor briefing out to people on the ground. This was resolved by putting an NR Construction Manager in the team who introduced more clearly defined signage of site teams’ areas. Handover of track beds was another issue and this was resolved with drop fencing.

With different contractors crews coming through the site all the time it was probably inevitable that some issues would recur, especially as some contractor staff were very transient. Despite this staff working on the project felt that site interfaces were better managed than on most major projects.

• **Station Interface Manager**

A dedicated Station Interface Manager proved to be a key enabler for the project. They managed access in a collaborative way to maximise benefit to the project within the constraints of a live station environment.

• **Collaborative approach to Section 106 requirements**

There were very clear Section 106 requirements for the project around apprenticeships, jobs, training, community engagement and employability. The Partners collaborated to design a joint approach that would meet the requirements and a decision was made by NR to put in place a dedicated workplace manager. This freed up the project managers and contractors to enable them to focus on delivery.

• **Collaborating to ensure compliance with sustainability requirements**

KO1 had varying levels of compliance around sustainability and it was felt that NR had not directed the supply chain properly. A totally different approach was taken on KO2 where NR looked closely at:
- Giving sustainability an appropriate weighting in the procurement process
- Collaborating properly and clearly on what sustainability meant for Thameslink
- Identifying the same clear objective and targets for each organisation
- Embedding the requirements in contracts and cascading them down the supply chain
- A central team to deal with sustainability and consents to provide an integrated and co-ordinated approach
- Dedicated consents managers to manage sustainability and consents on a daily basis and ensure consents process was built into the schedule

As a result, contractors felt they had a clear role within the team in contrast to the usual approach where they often feel ‘bolted on’ and are therefore less effective.

• **Engagement with passengers and with political and business stakeholders**

NR put in place a fully integrated Thameslink Programme Communications Delivery Team, with membership from each partner organisation, to manage this area. The sheer scale of the task (impacts at 284 stations) and complexity of messaging required an integrated campaign delivered collaboratively with industry partners. There were multiple strands to this engagement:

- **Passenger engagement**

The team directed passengers to online tools, identified relevant industry stakeholders and kept them informed, managed the impact on passengers, employers and businesses, engaged with Network Rail and Train Operator Company staff and developed water-tight contingency communications.

- **Engagement with political and business stakeholders**

The team prepared bespoke presentations and stakeholder information packs and ran many MP drop-in sessions MP drop-in sessions and stakeholder tours, including an event at Parliament and tours for the Greater London Authority, cabinet office, CBI, London First and London Chamber of Commerce, amongst others. They also proactively engaged early with numerous business groups across London to inform them of the changes and understand any concerns they may have.
- Digital
The campaign made maximum use of all partner and TfL websites to keep the travelling public informed about the planned engineering works and closures, including through a comprehensive journey planning microsite. The bespoke travel advice tool was widely acknowledged as a game changer in allowing for “one source of the truth” to underpin the campaign and deliver joined-up passenger messaging.

- Media
The team co-ordinated a series of carefully targeted media interviews, site tours, press releases, thought leadership blogs and articles linked to key programme milestones and achievements. Extensive proactive media briefing succeeded in embedding complex messaging about passenger queuing arrangements at stations during peak times, ticket acceptance arrangements and changes to train services and operations.

Potential Learning

- Align design philosophies of Rail Systems and Civils Design teams
Very different design philosophies exist in Rail Systems and Civils Design, with them effectively approaching the design process from opposite ends. Rail Systems (signals and track) approach each stage as a project in its own right, whereas for Civils Design the final product is key (with 9 interim stations). This issue should be recognised on future projects and appropriate resources dedicated in advance to identify the high risk interfaces and make sure the right people are in place at the right time to address them.

- Develop more detailed arrangements for collaborative 3D Modelling
There was an initial aspiration to apply collaborative modelling using a 3D CAD live design tool. Indeed, the Station team modelled in 4D (with time included). However, the signalling team were not used to this modelling approach. Protocols were put in place for live online working. Whilst this aspiration was good it proved to be too big a step and cultures didn’t allow it to succeed.

Track design, electric track equipment (ETE) and signal bonding plans were integrated and Civils added their data. The Station team was way ahead of others. There was so much information in a small space with so many changes that this model was vital in order for delivery to succeed and avoid clashes. Workshop attendees recommended that, in future, as a minimum track, ETE and signalling bonding plans should always be integrated into a 3D model.

Key issues experienced included:
- Model not always updated as new information or data was gathered, limiting and eroding its potential effectiveness for clash detection.
- Utility companies refused to produce As-Built drawings so they could not be put into the 3D model. A similar issue existed inside the station with people “too busy”. Updating the model should have had more emphasis. This had a real impact on rail systems who could not understand what the station would look like at any particular moment in time.
- Partners must all be clear on when the 3D model is to be used and how it will be kept up to date. A conscious decision and plan are required to be in place.
- There was no clear strategy for moving to Asset Management/BIM. This needs to be properly thought out from the outset.

- ‘Chainage’ versus ‘Absolute Global Position’
Linear scheme plans are based on chainage and contain significant potential for error when compared to the use of absolute coordinates. The 3D model can accept both sets of data and was used on LBAP to manage this issue. This approach has been expensive. In future it would be sensible to have both linear references and coordinates managed centrally by the survey assurance manager. Signals will also need to adopt this approach, especially in the placing of balises.
THEME 5 Collaborative Forums

Success Factors

- **3 Layers of governance: Management Board, ISB and DPF**
  - **Management Board** - NR wanted senior executives to be supportive and accountable for driving collaboration. This group gave collaborative senior executive oversight and was new in KO2. The Board met quarterly. Workshop attendees accepted that the group was never truly tested as collaboration worked well with problems being resolved in the Delivery Partners Forum.
  
  - **Delivery Partners Forum (DPF)** – This group met on a four weekly basis and was attended by project delivery directors from all Partners. This was a ‘nitty gritty’ interface meeting between rail systems and civils and worked very well as a forum where problems could be resolved. Issues for consideration by the DPF were supplied from the Integrated Working Group who met fortnightly. Presentations were provided to DPF meetings from collaborative teams and the Chair rotated (NR never chaired). It was a true meeting of Partners and was both open and honest. The single concern of the group was delivery and joint ownership. Nothing commercial was discussed.
  
  - **Integrated Schedule Board (ISB)** – Each employer representative owned his/her organisation’s own programme. The ISB looked at the combined schedule and then provided challenge to employer representatives. When disagreements arose these were escalated up to the DPF. A combined RAG programme was maintained for threat monitoring. The ISB’s role was to review the integrated schedule and report to the DPF. See Potential Learning section.

- **Mature approach to change management**

  The commercial arrangements put in place via the form of contract meant the usual approaches to change were applied but it also made them generally easier and quicker. It was recognised that there would inevitably be change on the project and facilitated it in order not to hinder the programme. The approach involved:
  
  - **NR Strategic Change Panel (SCP)** – An executive group. For changing a milestone etc. The Panel reviews, challenges and ratifies Local Change Panel recommendations.
  
  - **Local Change Panels (LCP)** – Meet fortnightly to discuss Early Warnings, threats and opportunities and reports to the SCP.

  It is understood that standard NR projects do not have arrangements of this type or a detailed documented process. The approach taken on LBAP has ensured that project directors from all parties could never be unsighted of emerging changes. Contractors were provided with their own risk pots and encouraged and empowered to handle risk and de-risk programmes as they are rewarded based on outcomes. This approach meant that contractors only go to change panels when it is appropriate (with significant items such as not being able to hit a milestone). This avoids excessive change reporting to SCP with most issues resolved in LCPs instead. LCPs met fortnightly and took a mature approach to the likely need for change in order to manage risk. Change management was removed from the ‘coal face’ entirely. The process was effective here and decision-making was good. The LCP spent the majority of its time considering and resolving Early Warnings as most smaller change was addressed via the risk pots.

  This was the right vehicle to manage change on this project. Early Warnings were raised and identified problems in advance and the commercial position was not allowed to get in the way of what’s the right thing to do. Fundamentally the project was always about maintaining the programme and delivering the schedule.

  Partners Balfour Beatty and Siemens felt this was a mature approach. All Partners understood required behaviours such as openness and honesty and worked together. This approach was facilitated by the contract mechanism selected and was different to other projects in that there was very senior NR representation on the SCP (Mark Somers and Lawrence Whitbourn) which facilitated speedy decision making and stopped any poor behaviours developing.

  LBAP was the first project to have a fully signed off “Station Change Process Agreement” in place.
• **Multi-Disciplinary Design Meetings**
The Multi-Disciplinary Design Meetings (MDDM) were a success story and a clear source of successful integration in practice. MDDMs were sessions where designers from all parties got together on a weekly/fortnightly basis to resolve design issues. This was a contractor-led initiative. Approximately 150 meetings have been held to date with 15-20 people attending at each one. This forum enabled the enforcement of a single source of truth across the programme. (For the Station there was a slightly more ad hoc approach with items/issues addressed as they occurred).

• **Station Project Working Group in place**
NR set up this 4 tier DfT recognised forum to set out how the various parties would interact (TOCs, Costain, NR and Station Team). It has proven to be an extremely successful collaborative forum, providing a single forum for the discussion of problems and to agree the best way forward. Dedicated resources to support it were provided by the project delivery team, the station team and by the TOCs. It has been funded by the Thameslink Programme on a full time basis. This is the first time it has been provided.

On other large projects the contractor is often left to manage this area and often struggles to do so effectively. NR project delivery teams’ resources are vastly experienced and this was of real support and assistance to the prime contractor who lacked real experience in this particular project type.

• **War Room approach highly successful**
The War Room was a facility for reporting and monitoring progress of site delivery and had a singular focus to protect the operation of the railway. It was set up on high profile / high risk (aka ‘Red Ranked’) weekends to ensure contractors adhered to the plan/schedule.

NR runs and leads the Room with partner organisations represented at all times and supervisors present out on site. The Room enables open communication and joint decision-making to take place in a timely manner with all Partners working together for success. LBAP was too big and too complex to not follow this approach.

An Engineering Supervisor (ES) manages operational risks and work tasks within a schedule on site. The ES is freed up by the presence of the War Room as are others on site. The highest number of calls received in the War Room in a single hour was recorded as 83.

Although it was expensive and involved micro-management of the schedule for a possession to take decisions on the work being done, the War Room has proven to be extremely successful. On KO2 there have been very few significant overruns (3 or 4 baseline plan changes only). This approach has put an end to reactive planning “in the hole” which can have dire consequences and provides a single source of truth to stakeholders through regular reporting. Progress reports are submitted into the War Room every six hours where they are signed off. This significantly helps Infrastructure Managers (IMs).

Whilst the War Room approach did exist in KO1 it was relatively insubstantial and not truly effective. It was subsequently strengthened for KO2 with investment in and introduction of new equipment (such as Sight-Eye, a site monitoring system).

The War Room is not a standard NR approach. Whilst the Delivering Works Within Possessions process (DWWP) does contain a requirement for a project manager to manage and own a possession and the associated reporting, interpretation of this varies widely. Outside Thameslink nobody has interpreted it in the same way and applied the WAR Room approach. On LBAP it was adopted due to the sheer complexity and high profile of project. It has proven to be very successful and workshop attendees felt it has probably saved in excess of 20 over-runs. The Room provides a crucial collaborative environment for agreeing change and reporting it outwards.

• **Delivering Works Within Possessions and Brown Paper Bag meetings**
Delivering Work Within Possessions (DWWP) meetings are an essential, mandated process and are whole day sessions. It is a process that is not always as rigorously applied elsewhere but it has been on Thameslink.
It involves a series of detailed planning workshops with all key stakeholders starting from two years out and then meeting more regularly from 52 weeks out (at T -52, -40, -26, -12, -8, -4, -2 and -1) to map stage delivery in as much detail as possible. This process requires regular reference to the integrated programme to ensure alignment. Relevant teams were brought in as required to contribute and interface meetings held with NR haulage teams (for material build), and Balfour Beatty teams (looking at and confirming access requirements and availability of access). These plans were constantly refined and updated as possession approached from over a year out.

The DWWP sessions ensured that all parties understood the objectives and were absolutely committed to not failing.

It is understood that DWWP has been applied far more fully on LBAP than is usual on other NR projects where it has been perhaps more of a tick box exercise. On LBAP the process has been applied fully with focus placed on the right areas, drilling down to get the answers required from all individuals. In this way all parties were able to manage their own destiny together. Partners presented plans and if they didn’t work they were discussed in detail and issues resolved. Far more rigour and challenge was applied compared to other NR DWWPs (in part because the team possessed the detailed railway knowledge and expertise to be able to do so) and the sessions ensured that everyone fully appreciated how their works impacted upon the programme as a whole. DWWP provided a forum where all parties could come together to develop a plan to deliver.

Brown Paper Bag meetings – Held at T-40. An integrated planning session to identify issues for that particular weekend possession. Very useful for team as all Partners appreciate scope and other Partners’ issues. This approach was used on other projects too. An issues list was developed from the meeting with individuals identified as responsible for chasing each one up and closing it out.

• Town Hall Briefings held ahead of every major stage or blockade

All Partners attended these briefings to discuss in detail all arrangements ahead of every major stage or blockade. It was a single, top down communication exercise to all Partners with their workforces also encouraged to attend. Often there could be a few hundred attendees at each session and the session would be re-run several times in a day.

• Construction Logistics and Integrated Possession Planning (CLIP)

A high level CLIP document was prepared at the outset and signed by all Partners. This group held weekly logistics planning meetings to plan possessions, and sat directly below the DPF. CLIP was a critical collaborative forum and pulled together all Partners, 3rd parties and Maintenance. Use of constructability slides with DWWP supporting to discuss, review and agree instantly. Right people engaged. As new people came in over time, each was tested out and expected to prove themselves by delivery. If you didn’t, your plans were challenged, reviewed and improved. Drives high performance. Everyone attended without fail. Given the respect it deserved.

Opportunities to further improve delivery identified through a series of ‘lessons learned’ workshops which were held following every major possession / delivery stage completion.

Potential Learning

• Arrangements for the Integrated Schedule Board require review

The initial contract model put in place required a high degree of interaction between schedules to create a single integrated schedule. Workshop attendees felt that initially NR was somewhat over-optimistic about delivery capability and that this led to a lack of transparency and loss of linkage. Poor personal behaviours and dynamic developed in meetings of the Integrated Schedule Board (ISB) as a result and led to the application of hard give/get schedule and target changes etc. In addition, it is understood that Project Directors did not feel that Management Board oversight of the DPF/ISB was appropriate as the Management Board were not sufficiently well informed around the programme to provide effective challenge. The initial collaborative arrangements were reviewed with Partners after 18 months and this led to changes in the contract model and in the ISB structure in order to improve collaboration and performance. Partners acknowledged that “programme was king” and the integrated schedule was crucial, but that initial execution had been poor. Following this, the ISB scope was much more limited to give/gets only with two separate programmes run and the Delivery Partners Forum was created.

It was proposed that future programmes should not attempt to draw together a great holistic integrated programme, but rather should focus on the key areas of risk with some additional resource made available to help as required.
• War Room resource requires consistent and appropriate level of experience
The NR Project Manager leading the War Room should always possess the appropriate level of experience and knowledge. Some concerns were expressed that, on occasion, this has not been the case with his/her level of experience varying from very experienced to relatively inexperienced. The pool of suitably experienced individuals should be extended by developing people. Shadowing should last several shifts, not just one.

• Effective Brown Paper Bag meetings require full engagement of all Partners
The Brown Paper Bag exercise enables the initial development of a basic programme for a possession. To do so it requires that all Partners think in detail about their REAL programme requirements. Workshops attendees felt that some Partners were more collaborative in this area than others and that some did not develop and share sufficiently detailed plans for genuine challenge by others at the sessions. The failure to draw up sufficiently detailed plans for challenge leads to requirements for follow up works, re-planning etc on other weekends.

The DWWP procedure mandates that all works must be complete 4 hours before end of possession. This led to some parties not being entirely open about their needs and timings.
THEME 6 Safety

Background Information
It is understood that there were significant improvements in safety performance between KO1 and KO2.

Success Factors

- **Independent safety culture survey**
  NR used an in-depth independent survey process in order to understand the supply chain’s cultural position as it related to safety. This involved numerous workshops with 10-15 people at each session. This reflected NR’s desire to be collaborative rather than ‘directive’ in this area.

- **Openness and sharing of best practice**
  There was a sharing of best practice between contractors which is rare in the industry and helped drive improvements in safety across the whole Partnership. Contractors and sub-contractors in particular have been known to hide safety issues, but this was definitely not the case here. In some cases, sub-contractors have actually been more willing to report issues than directly employed staff.

- **Going beyond compliance**
  There was a focus placed on going beyond compliance with an emphasis placed on care and wellbeing, mental health and dietary information etc. This was found to be good for team building and strengthening the collaborative team ethos.

- **Willingness to change**
  The Partners trusted NR, understood their issues and where appropriate changed their processes as a direct result. One example is the development of a ‘Just and Fair’ approach by Costain. This new process is led by their works superintendent and ensures operatives who have fallen below the required safety behaviour standards are given the opportunity to tell their side of the story. The facts in each case are properly assessed and a proper decision is made the following day. This has generated important learning as well as delivering improvements in performance.

- **Red and yellow cards**
  A yellow and red card system was introduced for PPE issues and expanded to all safety behaviours. This was applied directly to Balfour Beatty and their sub-contractors. If NR or others infringed the required standards Balfour Beatty removed them from site and wrote to their employer explaining the circumstances; Siemens have upheld all red cards issued to their staff (resulting in a 6-12 month ban from the site).

- **Directors’ Safety Group**
  When safety incidents occurred the management approach was ‘no blame’, open and honest with a willingness to share failings. This led to the development of the Directors’ Safety Group (DSG) across the Partnership which focused on finding the best way to put things right. Over time DSG evolved from formal meetings only into a more open ‘expo’ roadshow talking to staff on site. This was found to be much more effective at influencing staff behaviours at all levels.
• **Safety Leadership Team**
Balfour Beatty drove the development of a very successful Safety Leadership Team (SLT) with membership from NR, BB and sub-contractor staff as well as labour agencies, civils, signals and track teams. The team met monthly to resolve issues and implement solutions.

• **Collaborative design of CDM strategy**
The CDM regulations were not a straightforward fit with the project requirements in KO2. A series of workshops were held with Partners to model possible scenarios and find a model that would work and would comply with the regulations. A total of five scenarios were voted on by the Partners and the so called ‘doughnut model’ was selected.

• **Focus on ‘Significant Events’**
NR typically focusses on reporting in accordance with the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR). To improve on this a Significant Event Process was implemented which switched the focus from ‘actual harm or damage’ to ‘potential for harm or damage’. This revised approach was seen as a real enabler of a collaborative approach to safety. It meant suppliers were able to be entirely open about both the incidents and the root cause analysis that was undertaken. The key features of the process were:

- Senior level engagement and joint discussion of incidents in real time.
- A simple matrix developed to classify and define significant events.
- Regular ‘Embedment Checks’ reviews to confirm the new approach was working effectively
- A documented process with timescales etc.
- Sharing of learning across all Partners.

**Potential Learning**

• **Challenges in consistent application of policy with regard to Personal Protective Equipment (PPE)**
This lack of consistency across construction and maintenance has caused some issues and it would be sensible to look at how these may be avoided in future.
Conclusion

The delivery of the London Bridge Station project is widely acknowledged to have been extremely challenging because of its scale, complexity and the decision to deliver the works whilst the station remained operational. That the project team delivered the works within the original programme and managed 4,500 possessions with only one significant overrun is clear evidence that the overall approach was more than fit for purpose. It is also impressive that all of this was done whilst setting very high standards for safety.

Throughout the review we have been impressed with the obvious team spirit that exists throughout the LBAP organisation and a working culture that puts safety and the overall health of the project as the absolute priority with any commercial tensions dealt with openly so that they do not get in the way of delivery. Amongst the staff we talked to it was clear that collaboration is now so well embedded that the staff working on the project do not primarily identify with their parent organisations but see themselves as part of a joined-up London Bridge delivery team; a true example of partnership working.

The report includes a large number of individual measures that contributed to the success of collaborative delivery. It is possible however to highlight a number of areas that seem to have been key enablers:

Commercial Model

There was an appropriate level of thinking behind the selection of the commercial model and procurement strategy. Lessons were learnt from KO1 as regards agile decision-making, the allocation of risk and the potential for alliancing. We were impressed with the level of engagement with other infrastructure clients and major contractors. Although it is not usually possible to ‘cut and paste’ solutions from other sectors there are always important lessons to be learnt from this kind of knowledge sharing.

The decision to go down the partnering route and the use of ECC Option X12 gave the required functionality around risk and reward and put in place the foundations for collaboration around shared objectives. Although this may not be the appropriate solution for every major project the thought process behind it is exemplary.

ECI

It is encouraging that early involvement of the supply chain is becoming more widespread across NR and LBAP shows how powerful the approach can be. The team learnt lessons from KO1 where there had been a lack of continuity between the ECI providers and the delivery phase and this appears to have paid dividends.

ECI was carried out earlier than ‘usual’ and this allowed for a wide scope of activities which helped to build confidence around constructability, the master schedule and pricing. The work done at ECI appears to have been a key building block of the collaborative culture that developed later and it is telling that the vast majority of the master schedule planned during the ECI phase has stood the test of time.
The Right People for the job, change them if they’re not

The London Bridge redevelopment was a very complex and also a very high profile project and this appears to have made it easier for NR to assemble a team of professionals with the right skills and experience to deliver it. The prestige of the project and the collaborative culture also seem to be have been key elements in staff retention with many of the people we talked to having been on the project since its inception.

There has been an acceptance that some people find collaborative working more difficult than others. Some people who were more comfortable working in a more ‘traditional’ way were able to adapt and change. In some instances, though this wasn’t the case and personnel had to be changed for the benefit of the project.

It is also worth noting that the skills and aptitudes needed to develop the contractual and governance arrangements for a collaborative arrangement are not necessarily the same as those needed to lead it. This was found to be the case with LBAP when changes in leadership saw a significant improvement in the operation of the Partnership.

Culture driven from the top, team building

We were told in a number of the workshops that the collaborative culture had been driven very clearly from the top of the organisation. The senior leaders we spoke to were clearly passionate about the value of collaboration and have been consistent in communicating this passion throughout the LBAP team.

There has been significant investment in team building from the very beginning of the project and this appears to have been very successful in breaking down barriers between organisations. We would also single out the colocation of teams in this respect with everyone we spoke to emphasising the way that being in the same place was both very efficient and has contributed to a joint approach to solving problems.

Clear shared objectives – Schedule is King

A key enabler for any successful Partnership is agreement around shared objectives and on the London Bridge project the overriding priority for the team was to deliver the finished product safely and in line with the agreed programme. This recognised the high profile of the project, the level of stakeholder interest in it and the fact that missing a single milestone could lead to one year’s delay and significant additional costs. The phrase ‘schedule is king’ was used repeatedly in the workshops and has clearly been very effective as something to give the team a single-minded focus. On future projects there will obviously be different sets of constraints but the principle of putting clearly understood and shared objectives at the centre of collaborative working will be equally valid.

Culture of constructive challenge

It is possible when describing collaborative working to focus on the positive working environment it creates and fail to look at the need to be challenging where appropriate. We heard in a number of the workshops that the working culture had been built around open and honest debate about what was best for the project. Individuals were consistently challenged to demonstrate that their ‘asks’ would deliver a benefit to the overall project. It was acknowledged that some individuals found this difficult and in isolated cases it may have contributed to their leaving the project. On the whole though it was thought to have been a positive aspect of the working culture that meant that new joiners were quickly brought up to speed on the collaborative approach and what it required.

Good governance

The tiered approach to governance for the project appears to have worked well with issues resolved at the appropriate level. It was accepted (and it is a positive indication) that the Management Board was never truly tested as problems were generally resolved at the Delivery Partners Forum. Although the Integrated Schedule Board as originally conceived did not work as intended it is positive that this was acknowledged and changes were made to ensure that its scope was more deliverable and focused on the practicalities of delivery.
Change Management and Collaborative Planning

The range and scope of change management and collaborative planning activity on the project was comprehensive and effective.

The arrangement of strategic and local change panels meant that project directors were never unsighted on risks to delivery. The use of risk pots meant that contractors are incentivised to de-risk the programme and this reduced the number of small changes being submitted to the change panels.

The DWWP process as applied on London Bridge was a key collaborative forum that was applied rigorously with the level of detail increasing as the possession approached. Attendance at these meetings was properly managed to ensure that the team could drill down into the level of detail that allowed all the parties to jointly develop a plan to deliver. The Brown Paper Bag meetings added to this rigour and overall the approach was highly successful with an almost perfect record of delivering on time.

War Room

There was wide agreement that the War Room concept had been well implemented and been a key enabler of the successful delivery of high risk works. The War Room is resource intensive as it brings together all the Partners to micro-manage delivery but it proved to be a very effective collaborative environment for agreeing change and reporting it outwards. The War Room is thought to have prevented more than 20 over-runs and was important in developing trust amongst the Partners and establishing the LBAP team’s reputation for reliability.

Safety

TLP worked collaboratively to develop a mature approach to safety culture issues. This was enhanced and developed as the works progressed through all Key Outputs.

To sum up:

We were given the impression that Network Rail has acted as a very mature client and approached the project in a way that was both innovative and based on their experience on KO1. TLP was the first time NR had adopted a programme management approach (as opposed to a suite of projects). The programme was thus able to focus on the delivery of benefits, as opposed to outputs. NR was prepared to provide strong leadership where appropriate, acknowledged the strengths and weaknesses of the supply chain and put in place a collaborative environment that allowed all Partners to work together in a mutually beneficial way. It seems clear that the working culture and the processes that were in place on the London Bridge project were key to its success and that there would have been significant risk of failure, particularly around programme if a more traditional approach had been adopted. There is much that the industry can learn from what was done here and a similar approach could be just as powerful on future projects.
# Appendix 1 - Glossary of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AFC</td>
<td>Approval for construction process</td>
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<tr>
<td>BDU</td>
<td>Bermondsey dive-under</td>
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<tr>
<td>BIM</td>
<td>Building information modelling</td>
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<tr>
<td>CAD</td>
<td>Computer-aided design</td>
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<td>CAT</td>
<td>Collaborative assessment tool</td>
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<td>CBA</td>
<td>Construction before AFC process</td>
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<tr>
<td>CDM</td>
<td>Construction design and management regulations</td>
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<tr>
<td>CLIP</td>
<td>Construction logistics and integrated possession planning</td>
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<td>CP5</td>
<td>Control period 5</td>
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<tr>
<td>CRMP</td>
<td>Corporate relationship management plan</td>
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<td>DIT</td>
<td>Department for Transport</td>
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<tr>
<td>DPF</td>
<td>Delivery partners’ forum</td>
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<td>DSG</td>
<td>Directors’ safety group</td>
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<td>DWWP</td>
<td>Delivering works within possessions</td>
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<td>ECC</td>
<td>Engineering and construction contract</td>
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<td>ECI</td>
<td>Early contractor involvement</td>
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<td>ES</td>
<td>Engineering supervisor</td>
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<td>ETE</td>
<td>Electric track equipment</td>
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<td>GRIP</td>
<td>Governance for rail investment projects</td>
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<tr>
<td>ICE</td>
<td>Institution of civil engineers</td>
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<td>IM</td>
<td>Infrastructure Manager</td>
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<tr>
<td>ISB</td>
<td>Integrated schedule board</td>
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<td>KO</td>
<td>Key output</td>
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<td>LBAP</td>
<td>London Bridge Area Partnership</td>
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<tr>
<td>LCP</td>
<td>Local change panel</td>
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<td>MDDM</td>
<td>Multi-disciplinary design meeting</td>
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<td>NR</td>
<td>Network Rail</td>
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<td>NXG</td>
<td>New Cross Gate</td>
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<td>PPE</td>
<td>Personal protective equipment</td>
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<td>PRMP</td>
<td>Project relationship management plan</td>
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<td>RIDDOR</td>
<td>Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013</td>
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<td>SCP</td>
<td>Strategic change panel</td>
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<td>SLT</td>
<td>Safety leadership team</td>
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<td>TLP</td>
<td>Thameslink Programme</td>
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<td>TOC</td>
<td>Train operating company</td>
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References

London Bridge Area Redevelopment Plan V3, 2013
