Case Study:
Logistics Planning

THAMESLINK PROGRAMME
LEARNING LEGACY

London Bridge Station Redevelopment

Overcoming the logistics planning challenges during the London Bridge Station Redevelopment Project (LBSR)

Effective logistical planning is important for any construction project as it can provide massive benefits in efficiency and productivity that significantly reduces the overall cost of the project. During the redevelopment of London Bridge station, the project's biggest logistical planning challenge was: *How do we ensure that everything is in the right place, at the right times, while rebuilding a railway station that would remain operation in one of the busiest parts of London?* This case study focuses on how the project team answered this question, with reference to general advice for logistics planning on construction projects.

1. Logistics Vision and Principles

The Logistic 'vision' for the LBSR project was: "***The right stuff, right place, right time."*** The overarching principles associated with how logistics were managed for the project were:

- Consideration of efficiency relating to the use of materials, techniques, plant equipment and construction sequencing were addressed during the design phases
- Cognisance of the specific constraints and opportunities relating to both deliveries to and removal from site / sites
- Optimisation of available transport infrastructure and logistic related facilities adjacent / around the site(s), including significant factors relating to neighbours and key stakeholders associated with the logistics of the project
- Logistical factors were key influencing factors of elements of the project, impacting design, sequencing, methodology, materials and plant / equipment
- To seek a balance between the value and needs of the project and the environmental impacts both in the immediate vicinity of the project works and throughout the logistics chain.

2. Logistics Challenges

The project had many significant influencing factors relating to logistics:

- Sequencing or phasing of site works whilst maintaining the operation of both the train and underground stations
- Limited availability of areas for material storage and site facilities such as offices and welfare
- Significant adjacent developments (including The Shard, London Bridge Place and Guy's Hospital)
- Maintaining current logistic support, including security, for the on-going station operations and retail requirements
- Communications across each work element and with the station staff and operations during construction works
- Other Thameslink Programme projects where plans must be aligned.

3. Logistics Strategy

As the project progressed through GRIP Stages 6 and 7 the critical importance of the key logistical factors was incorporated into the decisions being made on the project. For the project to succeed these logistical factors were communicated and factored into decision making by the project team, its delivery partners and designers.

Significant logistics factors, those that influence the project and those that influence neighbours and / or key stakeholders were identified, defined and shared across the whole project team. These were then assessed and embedded within the decision-making process for each of the separate work elements as well as coherently across the whole project. The aim was to make the best decision for the project and Thameslink Programme Key Output

2 (KO2) by understanding the strengths, weaknesses, opportunities and threats that any identified factor posed along with appropriate actions.

Detailed logistics plans for each of the work packages were developed through the 'pre-construction' phase of the project and captured and communicated across the whole project team. Key logistic impacts on the project were also captured and shared across the wider project and KO2 teams.

4. Logistics Planning and Safety in the community

Logistics planning not only affects safety of personnel on site during construction, but also has a significant impact on the safety of the wider community. There are many factors within logistics planning that can have a negative effect on road and pedestrian safety, with associated environmental effects.

Through the Logistics Management Plan N420-COT-PLN-OP-000001 – a strategic document setting out how the site logistics would be planned and delivered, the Thameslink Programme and all its contractors sought to minimise these negative safety and environmental effects of the station redevelopment. Information from CLOCS (Construction Logistics and Community Safety website – an industry led, TFL-sponsored initiative) indicated that 35% of cyclists and pedestrian fatalities involving HGVs in London can be attributed to construction traffic. This raised the need for proper planning to reduce congestion and collisions near the LBSR site, particularly with site deliveries; extra planning for collections and servicing access during peak hours as well as reducing negative environmental impact of large numbers of delivery wagons and extended journey times in busy periods.

Apart from CLOCS, the project resolved to demonstrate commitment to exceeding the industry standard in managing work related road risk (WRRR) by mandating the Fleet Operator Recognition Scheme (FORS) - a voluntary accreditation scheme for fleet operators which aims to raise the level of quality within fleet operations through best practice in safety, efficiency, and environmental protection.

Factors promoting safety in the community included:

- FORS compliant vehicles were mandated since the start of the project
- Suitable for access of vehicles with appropriate safety features (hand rails / air bags etc) at every stage of the project
- Access to and egress from the site was appropriately managed, clearly marked and clear of potential obstacles
- Consideration for vehicle loading and unloading. All vehicles were loaded and unloaded in the location outlined in the Construction Logistics Plan
- Traffic routing including provision of a risk assessed vehicle route being provided to all delivery drivers
- Control of site traffic particularly at peak hours
- Monitoring of supply chain compliance with standards.

Factors affecting site safety:

- Segregation of plant and pedestrian routes
- Maintenance of access routes
- Correct use of plant and equipment including loading and unloading
- Site house keeping
- Material storage and transport around site.

Negative effects of poor logistics on safety performance

- Increased incidents around slips / trips (due to poor housekeeping)
- Increased incidents around plant movements when interfacing with public (CDM Regulation)
- Increased incidents around manual handling (manual handling regulations)
- Increased incidents due to use of the wrong equipment to move materials around site (PUWER – Provision & Use of Working Equipment Regulations).

There are numerous examples across the industry of safety incidents attributed to poor logistics. Below are six examples from 2016:

1. March 2016 – Overturning of a telehandler on a narrow path in Pyes Bridge Lane Camforth – just south east of lake district - injuring the plant operator. According to Network Rail bulletin– immediate action was to review roads to ensure fit for purpose.

2. June 2016 – Pallet Truck Accident at London Bridge Station due to double stacking of stillages in unstable transport position causing a minor injury to an operative. Due to incorrect selection of equipment, arrangements of load, late change to methodology and no landing deck for deliveries at platform level.

3. July 2016 – Serious road accident involving subcontractor van conveying operatives on M5 motorway due to driver fatigue, all occupants sustained minor injuries. Fatigue management did not consider the travel time; there is an obligation to ensure that workforce had sufficient time to travel to and from work.

4. October 2016 - Fatality caused by tipping dumper on M1 junction 16-19 smart motorway contract due to poor plant pedestrian interface. Care should be taken when loading materials into dumpers, and the plant and pedestrian routes should always be segregated.

5. December 2016 – Improper storage of plant and lighting equipment inside Balcombe tunnel meant that it was caught by a train damaging track circuit cables and causing significant performance impact. Leaving plant and materials in a tunnel, not properly secured, led to damage to trains and track infrastructure. It appears there were insufficient plans for e materials storage.

5. Managing logistics at London Bridge station

The LBSR site was very different at each stage. The station remained open and operational throughout, making material (and people) movement more important than ever. In 2017 the main access point into the station was at Tooley Street with limited space for vehicle offloading. Other site areas were much more constrained because they had been handed back for operational use. This highlighted the importance of planning for material deliveries and storage areas. Areas that were work sites before became open to the public; this meant that the project team needed to be aware of the affect that its work had on the sites (for example, at the London Bridge Bus Station).

5.1 Planning is key to productivity

The project stages were planned well in advance, with inventory of what materials and plant / tools were going to be required at each stage. Being able to effectively manage the flow of materials from source to site allowed for many advantages:

- Significant savings and reduction of waste. Planning allowed for materials to be on site every day as needed so that the construction team could work to maximum productivity.
- On site logistical planning meant that all materials were stored appropriately and were easy to locate. This sped up the project and improved efficiency.
- A clean site is a safe site – good logistical planning avoided any clutter and resulted in a better organised site, with knock-on benefits for health and safety and incidents.
- Inventory of what materials and plant / tools are going to be required at each stage.

5.2 Use of materials storage yards or construction consolidation centre (CCC)

- Allowed for materials to be ferried on a 'just in time' basis. This essentially means that rather than deliveries being taken directly to the site, they were instead collected in a CCC near but not necessarily on the site. This allowed for materials to be ferried on a 'just in time' basis as and when they are needed, keeping the site clear of obstacles and consequently, much safer.
- CCCs allowed for logistic managers to work safe in the knowledge that their materials were available and that all they needed to arrange was the final stage of delivery.
- This was especially useful as it provides for a degree of flexibility.

5.3 Getting to site

- Use of Just in Time deliveries for when materials are needed
- Online booking system for deliveries, linked to the work permit system
- Satellite logistics CCC yard(s) around London
- Assigning dedicated individuals responsible for managing deliveries
- Allocating holding areas for deliveries.

5.4 On-site

- Nominating individuals responsible for area supervision
- Holding area coordination meetings for the planning of work areas, pedestrian routes and material storage
- Designating good storage areas without obstructing work locations or green routes
- Appointing dedicated individuals responsible for transporting materials around site
- Use of site wide radio communication.

5.5 Lessons learned

There were some examples on the LBSR project where a lack of planning resulted in individuals making incorrect decisions. In the following picture, a roller was seen travelling from site up to Tooley street, indicating that a proper plan had not been made about how to get compaction plant up to the London Bridge Bus Station when it was needed. An individual then decided this was the best way.

Roller observed driving on Tooley Street heading towards Bus Station.

This second example demonstrates individuals trying to move a bulk bag that was too big for the pallet truck. This material was being moved from one side of the site to another. Better planning could have made sure that this was in the right place first time around and it would not have put these personnel in the position where they should move a potentially unstable load.

6. Recommendations for future projects

- Everybody planning work must ensure they are considering how materials, plant and labour get to where it needs to be and how this affects everyone else.
- Develop a Logistics Management Plan that is integrated to the Project Execution Plan and aligned to the project Safety Strategy and other industry standards.
- Continue to review and update the plan as the project progresses, taking emerging risks and issues (including site conditions and number of personnel) into consideration
- Where storage space is significantly limited, consider having offsite material storage or CCCs
- Mandate FORS compliant vehicles as a minimum standard for vehicles involved in deliveries, collection and other aspects of the project.
- Construction works may affect surrounding neighbours in different ways with potential for reduced stakeholder patience which needs to be carefully managed.
- Employ competent personnel who have experience to manage greater public interface as well as communicate with the project teams the expectation of the public, end users and Local Authority.
- Extra vigilance when loading or offloading vehicles and segregate vehicle and pedestrian routes.
- POWRA (points of work risk assessment) should be used where changes are needed within the shift.

About the author

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Further information

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