

Thames Gateway FQP

Construction Sector Scoping Study

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1 Introduction

1.1 Overview

- 1.1.1 Thames Gateway London represents one of the main growth areas for London and the Greater South East region, including a number of large scale projects such as the Olympics, Crossrail and Barking Riverside. Without suitable intervention, the concern is that the combined volume of construction activity could either outstrip the capacity of the existing supply chain, or lead to additional road traffic growth to move materials to site.
- 1.1.2 Projects such as Heathrow T5 and the Olympic Village have sought to reduce the road traffic impact of the construction phase, using alternative modes of transport to deliver large volumes of bulk material to site, and to consolidate the supply chain to compress the physical number of vehicle trips required to move a given volume of material to site. At the local level, smaller schemes have also been able to benefit from consolidation through the TfL-sponsored pilot project in Bermondsey, but the challenge has been to generate sufficient 'critical mass' to enable such multi-user facilities to achieve commercial viability.

1.2 Report structure

- 1.2.1 This report sets out work undertaken to date, as follows:
- Section 2 considers the concept of consolidation in the supply chain for construction projects, and reviews recent experience in and around London;
 - Section 3 provides an overview of the scale of development within the Thames Gateway London area;
 - Section 4 considers measures being undertaken to promote sustainable distribution for the construction phase of existing and proposed development schemes, within the Thames Gateway London area;
 - Section 5 reviews key criteria and potential site opportunities to create clusters of complementary activity in supply of construction materials, to facilitate use of alternative modes of transport for inbound deliveries, as well as consolidated local deliveries to site.
 - Section 6 sets out initial conclusions and recommendations.
- 1.2.2 The FQP area covers the Boroughs of Barking & Dagenham, Bexley, Dartford, Greenwich, Hackney, Havering, Lewisham, Newham, Redbridge and Tower Hamlets. In view of the important logistics facilities which exist in Thurrock on the opposite side of the Thames to Dartford, these have also been included.

2 The Construction Consolidation Centre concept

2.1 Overview

- 2.1.1 As discussed in the parallel scoping report on the retail sector¹, the broad objective of a consolidation centre is to reduce the scale of distribution activity required to service a particular site or area, by combining fragmented shipments of inbound goods (and in some cases return loads as well) into full loads for onward delivery.
- 2.1.2 Experience with the concept to date (see below) has indicated a number of other potential spin-off benefits, including improved sequencing of materials delivered to site, which in turn can lead to reduced wastage and damage; materials can be delivered as and when required, rather than be kept for long periods on site, which would then increase the risk of loss or damage whilst in situ.
- 2.1.3 A small number of construction consolidation projects have been undertaken to date in London, including:
- Heathrow Logistics Construction Consolidation Centre;
 - Heathrow Terminal 5 construction;
 - London Construction Consolidation Centre, Bermondsey;
 - Silvertown;
 - Brent Cross Cricklewood (proposed);

2.2 Heathrow Logistics Construction Consolidation Centre²

- 2.2.1 On behalf of BAA, Wilson James Ltd and Mace Ltd operate the Logistics Construction Consolidation Centre at Hatton Cross, Heathrow Airport. The 1,900 m² facility comprises both covered space for goods such as plasterboard, cement and fire alarms, and outside yard space for materials such as bricks, blocks and glass.
- 2.2.2 Goods are typically stored for no more than seven days, and are brought in only when required to be used on site. They are checked for quantity and condition, ensuring an early indication of any problems.
- 2.2.3 The Logistics Construction Consolidation Centre has successfully served more than 85 different trade contractors on 21 different projects at Heathrow. It helped pave the way for the Colnbrook Consolidation Centre which latterly serviced the development of Terminal 5.
- 2.2.4 New techniques and processes continue to be adopted (both high-tech and low-tech), for example to trial, report on, and then roll out the use of bar-coding of materials (not just for identification of goods but also for delivery validation on site). Benefits include 100% pick accuracy and a robust audit trail of goods delivered. Other benefits include reduced vehicle movements onto the site, minimising congestion and vehicle queues and also minimising the storage of materials and plant on site.

¹ Thames Gateway FQP Retail Consolidation Centre Scoping Study

² Information sourced from BAA, Wilson James and DfT Freight Bestpractice

2.3 Heathrow Terminal 5 construction (BAA / Laing O'Rourke)³

- 2.3.1 Terminal 5 at Heathrow Airport has represented one of Europe's largest and most complex infrastructure construction projects. Although equivalent in size to London's Hyde Park, the Terminal 5 construction site was limited in storage space.
- 2.3.2 BAA's Code of Construction Practice for T5 not only set measures to ensure safety and good practice in the construction works, but also provided safeguards to limit the impact of the construction on the local community.
- 2.3.3 In response to these requirements BAA created consolidation centres to manage the logistics of getting vast amounts of materials to the right workfaces at the right time. Situated in close proximity to the site, these centres ensured inbound materials met the quantity and quality demands of the project.
- 2.3.4 Throughout the groundworks phase of construction, the T5 site required daily deliveries of the following materials:
- 5,000 tonnes of aggregate;
 - 650 tonnes of ordinary Portland cement (OPC);
 - 260 tonnes of pulverised fuel ash (PFA);
 - 300 tonnes of rebar (reinforced steel).
- 2.3.5 By using the consolidation centres, BAA reduced the requirement for storage of concrete materials from three weeks to three days. The centres provided a local buffer of raw materials should variation in demand occur. Furthermore, as they enabled precise matching of deliveries with demand, construction related traffic on local roads was reduced.
- 2.3.6 Two consolidation centres were created:
- The **Colnbrook Logistics Centre** (CLC) was created on a site adjacent to the M4, M25 and A4 highways, as well as a freight-only branch line railway, providing good multimodal connectivity for bulk materials delivery, including bulk powders, aggregates and rebar. The CLC had three principal areas: a railhead to bring in all the bulk materials required from the UK and mainland Europe, a factory for the prefabrication and assembly of rebar, and a laydown area. Rebar manufacturing (the cutting and bending of steel reinforcement for concrete) and pre-assembly of materials was undertaken at the CLC in a purpose-built reinforcement facility. This facility used state-of-the-art technology to prefabricate and pre-assemble reinforcement cages in a much safer factory environment ready for use on site. The CLC could then store four days' supply of cement and two days' worth of rebar. At peak the CLC produced 500 tonnes of rebar per day with 80% of this being turned into rollmat or prefabricated cages. The site also carried out work package consolidation, demand fulfilment and waste management tasks.
 - The smaller **Heathrow South Logistics Centre** (HSLC) also prefabricated and pre-assembled reinforcement cages, as well as managing maintenance of small tools. As the construction programme moved out of its civils phase and into the buildings and fit-out phases, this facility was then used as a consolidation centre for assembling materials into work packages ready for delivery to site.

³ Information sourced from BAA

- 2.3.7 Together, the two logistics centres provided a local buffer for raw materials, reducing the storage time for concrete materials from three weeks to three days.
- 2.3.8 The rail link to the CLC was used extensively during the project, receiving daily trains of crushed rock aggregates (the majority of that used on the project), cement and steel reinforcement. Peak deliveries included:
- 5 trains delivering 1,500 tonnes of steel reinforcement per week;
 - 3 trains delivering between 2,400 – 3,600 tonnes of cement per week;
 - 20 trains delivering 24,000 tonnes of aggregate per week;
 - 3 trains delivering between 1,200 – 1,800 tonnes of PFA per week.
- 2.3.9 In total, some 3.3 million tonnes of material were delivered to site by rail, saving over 31 million HGV miles which would otherwise have been incurred.
- 2.3.10 To further minimise vehicle traffic and mileage, a range of other initiatives were introduced, including:
- 3 on-site concrete batching plants were constructed, with most of the raw materials delivered by rail, to remove the need for concrete to be delivered by road;
 - Use of containerised tank units (Isotanks) for the PFA deliveries by rail enabled final delivery to the works site to be made by internal haul roads, using self-loading container handling HGVs (sideloaders);
 - A forward lorry park was provided to enable any inbound HGVs arriving early to be booked in and held in one location, before being called forward in the correct sequence;
 - An internal 'marketplace' was established on site to enable commodities to be supplied or returned as required by contractors. As an example, the creation of a supply and maintenance facility for small tools at the HSLC, together with part-centralisation of 'common user' plant, reduced down-time for contractors and reduced the potentially large number of visits by service vehicles which would otherwise have been involved;
 - Consolidation of the various inbound deliveries at the CLC into correctly sorted and sequenced 'works packages' reduced the number of vehicle deliveries into the works site itself, alleviated congestion and enabled packaging to be removed and recovered before the deliveries were made into the works site;
 - To facilitate the smooth running of the construction phase, a software system called Project Flow collated demands for materials and ensured these were delivered as and when required.
 - Common hauliers were used for deliveries from suppliers during the 'fit out' stage, to increase efficiencies;
 - Local agreements on working hours and HGV delivery routes, with a telephone helpline.

2.4 London Construction Consolidation Centre, Bermondsey (TfL, Wilson James)⁴

2.4.1 The London Construction Consolidation Centre (LCCC) was set up in October 2005 as a pilot study for a period of two years, ending in October 2007. It was located in South Bermondsey, outside the congestion charge zone. The pilot cost £3.2 million and the partnership comprised Stanhope PLC, Bovis Lend Lease, Wilson James and Transport for London, with each partner performing the following roles:

- Transport for London: data collection, promotion of consolidation centres;
- Wilson James Ltd: physical management and operation of consolidation centre, construction logistics expertise, provision of trucks and staff;
- Stanhope Plc: site development;
- Bovis: major contractor, project management of all other contractors.

2.4.2 The LCCC's mission statement was:

“To deliver in the safest and most efficient manner possible the right materials to the right site at the required time in active partnership with trade contractors and project managers.”

2.4.3 The objectives for the LCC were to achieve the efficient movement of construction materials from suppliers to the construction sites through:

- Improving project efficiency, through just-in-time delivery of materials, tools and plant hire equipment;
- Reducing traffic congestion in Central London;
- Reducing journey times for suppliers delivering materials;
- Improving safety by reducing congestion on construction sites;
- Allowing trade contractors to concentrate on their core production skills.

2.4.4 The LCCC was located in Bermondsey near Millwall Football Club, south of the River Thames. The warehouse, encompassing 5,000 m² of space, was previously a newsagent distribution centre. The Bermondsey site was chosen for the following reasons:

- The LCCC needed to be within 40 minutes' travel time of the construction sites and be far enough away from Central London to reduce construction vehicle movements in the central zone;
- Bermondsey has good links to both the A2 and M25, and is well positioned to receive international traffic while providing good access to the UK road network;
- The route from Bermondsey into Central London is relatively uncongested, with travel time for the LCCC vehicles ranging from 15-30 minutes, depending on the time of day.

⁴ Information sourced from TfL, Wilson James, DfT Freight Best Practice, European Environment Agency

2.4.5 The LCCC acted as a distribution centre for construction materials to four major building projects in Central London, namely:

- Unilever House, the head office of Unilever Plc, providing 23,000 m² of office space;
- Basinghall Street, the global headquarters for Standard Chartered Bank, providing 18,000 m² of office space;
- Coleman Street, the global headquarters of Legal & General, with 10 storeys and 17,000 m² of office space;
- Bow Bells House, mixed use development with 13,000 m² of offices and 1,300 m² of retail space.

2.4.6 Importantly, unlike some consolidation centres, construction materials were not stored for long periods of time. The primary purpose of the LCCC was to facilitate the efficient flow of materials from suppliers to sites, with a maximum storage time of 10 days.

2.4.7 The LCCC had 24-hour security, important for handling large quantities of extremely high-value goods which would otherwise be stored on the construction site, proving greater risk for damage and theft.

2.4.8 The LCCC operated between 07:30hrs and 17:30hrs Monday to Thursday and 07:30hrs to 16:00hrs on Friday with 24-hour operation available if required.

2.4.9 The LCCC employed 16 staff, as follows:

- 1 site/project manager general running of the project, liaising with trade contractors;
- 1 depot manager time split between the office and warehouse;
- 1 depot supervisor supervision of warehouse staff;
- 2 supply controllers dealt with suppliers and the construction sites, organised both inbound and outbound transport;
- 1 admin clerk general administration for the operation;
- 4 full time HGV drivers driving to and from sites, plus helping to load vehicles;
- 4 fork-lift truck drivers loading and unloading of vehicles, put-away of products;
- 2 warehouse operatives general warehouse duties, making deliveries at peak periods.

2.4.10 The LCCC vehicle fleet comprised of:

- 1 x 26 tonne flatbed rigid (Euro 3 emission standard);
- 2 x 26 tonne flatbed rigid with crane (Euro 3);
- 1 x 18 tonne flatbed rigid (Euro 3);
- 1 x 7.5 tonne curtainsider rigid (Euro 3);
- 1 x 3.5 tonne van.

- 2.4.11 The majority of the fleet had GPS tracking and telematics systems installed as well as a mobile phone.
- 2.4.12 For inbound deliveries, trade contractors were required to notify the LCCC by 12:00hrs the day before delivery was due. Goods were ordered by construction site contractors for bulk delivery to the LCCC (maximum 10 days stock), which was then called off to site each day with orders sufficient to cover one or two days' on site requirements.
- 2.4.13 The LCCC provided a designated area where vehicles arriving early could wait, and should the delivery not arrive, the LCCC would inform the trade contractor who would then be required to arrange a new delivery time for their goods.
- 2.4.14 Following arrival at the LCCC, inbound deliveries could then be split and delivered to the construction site in individual units as required, along with a mix of other goods of both high and low value. This allowed for the rest of the initial delivery to be stored securely in the LCCC to await call-off. As the delivery distance from the LCCC to the construction sites was relatively short, there was more flexibility to cancel or delay deliveries. In circumstances such as high winds where cranes could not be used on the construction sites to unload goods, other goods could then be requested.
- 2.4.15 A limited amount of pre-assembly work was also carried out at the LCCC, including glazing windows and the preparation of lift tracks for lift rails. The LCCC also allowed sites to return excess materials, which had passed through the centre, for recovery by individual trade contractors.
- 2.4.16 Note that a number of deliveries were still sent directly to the construction sites, including time-critical products such as aggregates, structural steel and readymix concrete. Other items such as escalators (due to their awkward size) and furniture (usually a full load) were also delivered directly.
- 2.4.17 In order to justify the concept of the LCCC, targets and key performance indicators (KPIs) were agreed between Transport for London and Wilson James. The KPIs were based on the performance achieved at the Heathrow Construction Consolidation Centre, as follows:

Table 1 LCCC key performance indicators (source TfL)

KPI	Target	Performance
Reduction in freight journeys	40%	70%
Reduction in journey time of supplier deliveries to contractors	0.5 – 1 hour reduction	2 hour reduction
Delivery reliability	95%	97%

- 2.4.18 Other achievements for the project included:
- 5,393 deliveries made, of which around one-sixth required 'just-in-time' delivery (ie less than 24 hours), which would have been more difficult to achieve with normal delivery arrangements;
 - Improving the overall reliability of the supply chain, as the 97% on-time delivery from the LCCC to site was almost four times greater than the 24% on-time delivery achieved by suppliers into the LCCC;
 - An estimated 74% saving in CO2 emissions across the three delivery sites for which data was available;

- An estimated 70% reduction in traffic to the construction sites as a result of using the LCCC;
- An estimated minimum saving of £21,000 in Congestion Charge payments as a result.

2.4.19 The overall capital and revenue costs for two years' operation from October 2005 to October 2007 for the LCCC pilot were £3.2 million. Transport for London (TfL) funded £1.85 million of this total, while the remaining £1.35 million was funded by the developers and construction companies. The companies participating chose voluntarily to use the LCCC for the four construction sites, with the costs being passed on to the individual building contractors.

2.4.20 There was potential for Bermondsey to consolidate stock for 10 construction sites, as space utilisation at the LCCC ranged between 65-90%. Whilst cost-benefit analysis was not provided for the project, it was reported that, depending on size, six construction sites would have been required in order for the operation to be financially self-sustaining.

2.5 Silvertown

2.5.1 Wilson James have moved their former operations at the LCCC to a 6,000 m² site at Silvertown, close to the Thames Barrier and able to service the City, east London and Docklands, and the 2012 Olympics construction sites. The Silvertown centre is also outside the London Lorry Control Zone so deliveries can be made around the clock.

2.5.2 Skanska and the next generation of Bovis Stanhope schemes have reportedly signed up to the new facility, with capacity to service more projects from the site.

2.6 Brent Cross Cricklewood (proposed)⁵

2.6.1 Brent Cross Cricklewood (BXC) is one of London's major regeneration schemes. Over a period of around 20 years the plans propose to create a new town centre with 27,000 jobs, 7,500 new homes, a transformed Brent Cross Shopping Centre, a new commercial district, a new high street and parks and open spaces. The plans will also involve significant investment in transport and community facilities, including modern new buildings for three schools, new health facilities, a new train station, new bus station, new bridges and road junctions.

2.6.2 The application site extends to 151 ha and is located within the London Borough of Barnet, comprising a significantly area of brownfield land comprising industrial uses, former railway land and retailing premises surrounded by large areas of surface level car parking.

2.6.3 The application site has been identified as appropriate for comprehensive and strategic redevelopment. In December 2005 Barnet Council adopted as Supplementary Planning Guidance a framework for the regeneration of the area – the Cricklewood, Brent Cross and West Hendon Development Framework. The current planning application responds to that guidance.

2.6.4 One of the specific objectives for the scheme is to “deliver an environmentally sustainable development which provides residents, workers and visitors with the opportunity to reduce their carbon footprint”.

⁵ Information sourced from Brent Cross Cricklewood

- 2.6.5 The planning application seeks planning consent for a comprehensive mixed use redevelopment comprising some 1.4 million m² of floorspace for residential, office, industrial and other business uses, including rail freight facilities, waste handling and treatment facilities and a combined heat and power plant, and associated infrastructure.
- 2.6.6 BXC is a highly complex regeneration scheme, not only due to the sheer size of the application site, but also due to the number of active uses on site and the need to provide replacement facilities before existing premises can be demolished.
- 2.6.7 At present, BXC is considering scope to develop a Construction Logistics Centre (CLC) along the lines of that created for Heathrow T5, focused on a large area of existing and former railway lands, to provide opportunities for rail transport to service the construction phase.
- 2.6.8 Over the life of the project, initial estimates suggest around 2 million tonnes of waste and fill material will require transportation on or off site, together with more than 1 million tonnes of other construction materials, the equivalent of up to 5 trains per day to and from the site if all this material were moved by rail.
- 2.6.9 Similar to the Colnbrook Logistics Centre, the BXC facility could provide for receipt of bulk materials, work package consolidation and pre-assembly tasks, but additionally could also be used for export of spoil and import of fill, together with scope to handle deliveries of pre-assembled building modules and other materials during the fit-out stage.
- 2.6.10 Work on refining the scope and feasibility of the BXC CLC forms part of a Freight Quality Partnership framework, being progressed by BXC in liaison with Transport for London and LB Barnet.

3 Major construction projects in the Thames Gateway London area

3.1 Overview

3.1.1 A number of major construction projects are either in hand or proposed to start within the Thames Gateway London area in the next 5 years, dominated by construction of the Olympic Village for the games in 2012.

3.1.2 The London Plan gives an overall indication of the scale of development during the life of the Plan in the local area:

Table 2 Opportunity Areas and Areas for Intensification in Thames Gateway London, 2001-26⁶

Borough	Area	Indicative employment capacity	Minimum number of homes
Greenwich	Deptford Creek/ Greenwich Riverside	4,000	8,000
Lewisham	Lewisham-Catford-New Cross	3,500	6,000
Greenwich	Greenwich Peninsula & Charlton Riverside West	7,500	15,000
Greenwich	Woolwich, Thamesmead & Charlton Riverside East	9,000	15,000
Bexley	Bexley Riverside	4,900	4,000
Tower Hamlets	Canada Water/Surrey Quays	2,000	2,000
Greenwich	Kidbrooke	400	2,400
Tower Hamlets	Isle of Dogs	110,000	10,000
Newham	Lower Lea Valley including Stratford	50,000	32,000
Newham	Royal Docks	5,500	14,000
Barking & Dagenham	London Riverside	14,000	20,000
Redbridge	Ilford	200	6,000
Total		211,000	134,400

3.1.3 As an indication of the size of major schemes within this overall context, many of the current batch of major schemes lie within the boundary of the London Thames Gateway Development Corporation (LTGDC), and are set out in the table below:

⁶ Data sourced from Tables 5C.1 & 5D.1, The London Plan Spatial Development Strategy for Greater London, Consolidated with Alterations since 2004, GLA February 2008

Table 3 Major development schemes in LTGDC area⁷

Borough	Site	Housing (units)	Office (m ²)	Retail (m ²)	Industrial (m ²)	Status
Barking & Dagenham	Abacus Park				35,000	Outline consent
Barking & Dagenham	Dagenham Dock Sustainable Industrial Park				27,500	Identified Site
Barking & Dagenham	Barking Riverside	10,800				Planning permission
Greenwich	Greenwich Peninsula	10,010	306,300	12,600		Planning permission
Greenwich	Greenwich Millenium Village	1,843				Planning permission
Havering	Beam Reach 5				85,470	Planning permission
Havering	Beam Reach 6				46,451	Identified Site
Havering	Beam Reach 8				45,451	Planning permission
Newham	Stratford City	7,500	404,450	116,667		Planning permission
Newham	Olympic Site	6,341	101,920		133,367	Planning permission
Newham	Canning Town	2,842	46,000			Site
Newham	West Ham Masterplan	2,500				Identified Site
Newham	Silvertown Quays (Millenium Mills)	6,000				Planning permission
Tower Hamlets	Wood Wharf		270,000			Identified Site
Tower Hamlets	Billingsgate Market		200,000			Planning permission
Tower Hamlets	North Quay, Aspen Way		195,000			Planning permission
Tower Hamlets	Riverside South, Westferry Circus		165,000			Planning permission
Tower Hamlets	Heron Quay		127,000			Identified Site
Tower Hamlets	2 Millharbour		70,977			Planning permission
Tower Hamlets	Blackwall Reach	2,500				Identified Site
Total		50,336	1,886,647	129,267	373,239	

⁷ Information sourced from Boroughs and London Thames Gateway: Revealing the Investment Potential, Jones Lang LaSalle for LTGDC, 2007

- 3.1.4 As an indication of the potential scale of construction traffic which could be involved, we estimate that the above schemes would together account for around 50 million tonnes of construction materials, including 44 million tonnes of aggregates, 5 million tonnes of cement and 3 million tonnes of reinforcing steel. This would represent the equivalent of more than 2.6 million rigid HGVs (20 tonne payload) of the type typically used for construction traffic.
- 3.1.5 A range of other development proposals exist in the wider Thames Gateway London area, include:
- Crossrail: construction of a new £16 billion railway over a 118 km route, linking Maidenhead with Shenfield and Abbey Wood, including 21km twin-bore tunnel sections linking Paddington with Stratford and Woolwich;
 - London Gateway (Thurrock): development of a new deepsea container port and 900,000 m² port-related logistics park on the former Shell Haven petrochemicals complex;
 - Howbury Park (Bexley): a new rail freight interchange with 198,000 m² of distribution floorspace and interchange facilities;
 - Imperial Gateway (Bexley): mixed-use development comprising residential (400 dwellings), retail and commercial floor space;
 - Veridion Park, Thamesmead East (Bexley): a new business park with planning permission for 63,000 m² of space for high-tech, office, light industrial, and distribution businesses;
 - Base M25, Erith (Bexley): former Pirelli manufacturing site with planning permission for around 60,000 m² of industrial and distribution space;
 - Woolwich Town Centre (Greenwich): 46,450 m² of new retail floor space and 1,500 new homes;
 - Woolwich Royal Arsenal (Greenwich): outline planning permission for a Masterplan for the redevelopment of land at the Royal Arsenal and Warren lane, which proposes a new commercial and leisure quarter in Woolwich including 2,517 new homes, retail and office space and a combined heat and power plant;
 - White Hart Triangle (Greenwich): 161,900 m² of business uses on formerly derelict land between Thamesmead and Woolwich;
 - Tripcock Point (Greenwich): 2,000 new homes, together with office, retail and community facilities;
 - Lewisham: major regeneration and refurbishment of housing estates.

4 Measures to promote sustainable distribution for construction works

4.1 Overview

4.1.1 To determine the extent to which scheme promoters actively seek to achieve sustainable means of transport during the construction phase, a selection of major and minor schemes have been assessed as set out below. Following up on the recent experience of the Thames Gateway FQP River Event, where a number of riverside development schemes were observed with no apparent use of the Thames for the construction traffic, this assessment has sought where possible to identify schemes close to the River Thames and its tributaries, to consider how far scheme promoters have sought to use water transport for construction traffic.

4.2 Major schemes: 2012 Olympics

4.2.1 The 2012 Olympic Games is focussed on a 200 hectare site in the Lower Lea Valley, which will initially be developed for the main Olympic stadium, aquatics centre, velodrome, three sports arenas, a hockey centre and accommodation for competitors. Following the Games, the site will be reworked to provide a legacy of public venues, open space and associated housing, retail and office space.

4.2.2 The Olympic Delivery Authority has prepared an Olympics Construction Transport Management Plan (CTMP), to provide the infrastructure and management of transport to enable the construction of the Olympic Park (OP) in the best way possible. The CTMP has a number of sustainability principles related to the construction phase of the Olympic site, including the target of 50% of construction materials being moved by sustainable means (eg by river and rail). The initial phases of the CTMP are now being implemented, with examples of related procurement tenders and projects including:

- Site clearance and preparation: work commenced in July 2007, with much of the 2.5 km² site being contaminated land, requiring significant remediation work, as well as demolition of a large number of buildings. The majority of the material generated from the demolition, site clearance and excavation (90%, amounting to around 1.5 million m³) will be reused on site, reducing the need to transport materials to and from the site. Removal of 52 pylons across the site requires the power cables to be buried in tunnels under the site, generating 0.2 million m³ of spoil and 200km of power cabling;
- Infrastructure for construction traffic: a series of roads and bridges are being constructed to enable works access within the OP site during 2007 and 2008. Two main entrances are being created, with roads penetrating deep into the site. Water and rail freight compounds are being established inside the site to assist the ODA's target for 50% of construction materials by weight to be brought on or off site by rail and barge. The Park site is being made secure, with advance logistics offices established across the site and welfare facilities in place for workers;
- East London Logistics Centre: the ODA is seeking to procure an off-site logistics facility of sufficient scale and capacity to deliver the level of service requirements to support the construction of the OP and Venues for the 2012 Olympic and Paralympic Games. The logistics facility is to enable the transportation of materials, goods and equipment to and from the OP and associated Olympic venues safely and securely. The ODA is seeking to optimise the use of sustainable modes of transport and reduce the impact of vehicle movements and carrying capacity on the local and regional road networks and local communities. EWS has proposed a site at Beam Reach in Dagenham to service this requirement (see below);

- M11 Chigwell Logistics Centre: the ODA is seeking to create an off-site logistics centre located adjacent to the M11 to support and maximise the integration of the materials logistics strategy for the construction of the OP. The facility is required on a temporary basis, primarily as a temporary lorry holding, security screening and marshalling facility for the effective, efficient and sustainable transportation of construction materials, plant and equipment to the OP construction site. The proposed site is located immediately adjacent to the M11 in the Chigwell area; located on the East site of the M11 accessed by existing slip roads, approximately 4 miles south of the M25 interchange with the M11 and 1 mile south of junction 5 of the M11. The main entrance for material deliveries to the OP construction site is situated some 7.5 miles away following the M11, A406 and A12. The total area of the proposed M11 Logistics Centre site is approximately 3 Ha, divided centrally by the M11, with each side being connected via a road bridge to the north end of the site and a pedestrian tunnel, which is currently disused, to the centre of the site;
- A Delivery Management System (DMS): used to monitor vehicle movements, from off-site Logistics Centres to, around and within the OP construction site boundary;
- Prescott Lock: British Waterways is project managing the construction of Prescott Lock, which will keep water levels to its north at a controlled level, allowing up to 1.75million tonnes of construction materials to be brought in by barge and taking up to 170,000 lorry journeys of local roads;
- Beam Reach: rail freight operator EWS is seeking to construct a temporary road/rail freight facility on a rail-linked site in Dagenham, which could be used for the storage and onward distribution of materials required for the construction works, some 5 miles to the west of Beam Reach. It is understood that the facility would only be built should EWS be awarded an appropriate contract, and EWS has indicated that the final design will not be fixed until later in the design process as their precise needs are clarified. The proposals include offices, a trailer park, storage and interchange facilities. EWS' ambition is that construction materials for the OP would be delivered by road to the proposed handling facility using the A13 and the grade separated roundabout junction situated at the southern end of Marsh Way, before being loaded onto rail wagons via a newly constructed track for transfer to the OP. The facility would operate on a 24 hours a day basis, and if carried forward would remove a substantial number of road movements from in and around the OP.

4.3 Major schemes: Crossrail

- 4.3.1 The project will involve construction of a new £16 billion railway over a 118 km route, linking Maidenhead with Shenfield and Abbey Wood, including 21km twin-bore tunnel sections linking Paddington with Stratford and Woolwich
- 4.3.2 Crossrail will be the biggest transport addition in London and the South East for 50 years, and will also be the biggest construction project in Europe. At the height of construction it is estimated that around 14,000 people will be employed.
- 4.3.3 As an indicator of the scale of construction activity, the project is expected to generate some 8 million m³ of excavated materials and construction waste, with about 30% of the excavated material to be removed by rail, 15% by barge and the remainder by road. Deliveries will include an estimated 1.1 million m³ of concrete, 140,000 tonnes of steel reinforcement and 140km of rail. The delivery of materials such as ballast, sleepers and rails is expected to be mainly by rail⁸.

⁸ Crossrail Information Paper D6 – Construction Traffic, November 2007, paragraph 2.1

4.4 Major schemes: Beckton Gasworks (National Grid)

- 4.4.1 A comprehensive mixed-use redevelopment including up to 1,500 dwellings (class C3 apartments and townhouses and *sui generis* (unique) live-work units); up to 25,000 m² of employment floorspace (class B1 & B8), up to 9,500 m² of hotel accommodation (class C1); a nursing home of up to 4,000 m² (class C2), up to 1,200 m² of retail and community service floorspace (Class A1,A2,A3 & D1) and approximately 8.5 hectares of publicly accessible open space and strategic landscaping.
- 4.4.2 Whilst the development site fronts the River Thames, where piles still remain for two former jetties, and despite the aborted Thames Gateway Crossing proposals indicating use of one jetty as part of its works compound, no mention is made in the planning application about use of the Thames for construction traffic for this major mixed-use scheme.

4.5 Other schemes: Gallions Reach (Crest Nicholson)

- 4.5.1 A development of 260 dwellings, the planning application (July 2008) includes provision for:
- Just-in-time deliveries of materials to site to minimise on-site storage;
 - All vehicles used for construction traffic to be minimum Euro III emissions specification;
 - Target of using 25% (by weight) recycled or reclaimed materials for construction, rising to 75% for external landscaping materials.

4.6 Other schemes: Devon Wharf (Chilton Transport (Bow) Ltd)

- 4.6.1 Erection of 4/5 and 14 storey buildings to provide 1,000m² of commercial space comprising one A1/A2/A3 unit (275 m²), 14 affordable B1 units and 66 residential units with 21 car parking spaces, landscaping and a riverside walkway. The planning application proposes a Site Waste Management Plan and re-use of existing materials on site where possible.
- 4.6.2 Whilst the development site is alongside Bow Creek and has an existing quay fronting the Creek, no mention is made in the planning application about use of the Creek for construction traffic.

5 Opportunities for consolidation of construction material

5.1 Site selection criteria

5.1.1 It is apparent that one of the key success factors for consolidation of freight activity, whether construction materials or other products, is to achieve sufficient 'critical mass' of business, not only to achieve the performance of sites such as the LCCC, but to ensure that such activity can be financially self-supporting as far as possible.

5.1.2 Scope exists to achieve such critical mass either by creating single, unified sites such as the CLC or proposed BXC facilities, or to achieve clusters of related activities around key infrastructure links, such as wharves, rail terminals and highway intersections. These sites could then service not only their 'anchor' development but surrounding developments as well.

5.1.3 The core activities which such sites and clusters could usefully provide include the following:

- Bulk materials storage (eg aggregates, sand, PFA, cement, other fill, rebar, bricks and blocks);
- Storage for non-bulk materials and containerised goods;
- Batching plants for concrete, tarmac, roadstone;
- Buildings to undertake work package assembly;
- Intermodal interchange (road / rail / river);
- Waste processing and recycling;
- Local delivery vehicles.

5.1.4 As with the parallel scoping reports about freight interchanges and lorry parks, one of the critical balances to be achieved with site selection should be to secure sites suitably located to minimise onward transportation distance and time to construction sites, whilst at the same time being sufficiently distant from residential areas. This is particularly important given that some of these facilities could operate around the clock. Equally important, land use and transport planning policies must be capable of accommodating such development on the sites in question.

5.2 Potential site opportunities

5.2.1 Drawing on existing river and rail-linked sites where construction materials are already handled, a number of potential site opportunities can be identified, as shown overleaf.

5.2.2 In addition to developing sites and clusters capable of supplying a range of construction materials, there is also scope to create mobile facilities for moving large, consolidated flows of construction materials to construction sites. The main opportunity for this would be with the River Thames, where self-discharging barges could be used to transport a range of materials direct to riverside construction sites, and to a lesser extent with rail, where systems already exist for self-discharging trains to deliver aggregates and other unitised product direct to rail-linked sites, or to nearby rail terminals for final delivery by road or conveyor.

Table 4 Potential site opportunities for consolidation of construction material

Borough	Site / Area	Transportation			Existing facilities (Y = yes, A = adjacent)						
		Road	Rail	River	Wharf(s)	Rail head(s)	Bulk storage	Other Storage	Steel handling	Batching plant	Waste handling
Barking & Dagenham	Dagenham	A13	LTS	Thames	Y	Y	Y	A	A	Y	A
Barking & Dagenham	River Road	A13	-	Bow Creek	Y	-	Y	Y	Y	-	Y
Bexley	Crayford	A206	NKL	Crayford Creek	Y	A	-	A	-	-	Y
Bexley	Erith	A206	-	Thames	Y	-	Y	A	-	Y	-
Greenwich	Angerstein	A206/ A102	NKL	Thames	Y	Y	Y	A	-	Y	-
Newham	Bow/ Stratford	A11/ A12	GE	Bow Creek	Y	Y	Y	Y	-		Y
Thurrock	Purfleet	A1090	LTS	Thames	Y	Y	Y	Y	-	Y	-

6 Conclusions and recommendations

6.1 Conclusions

- 6.1.1 Despite recent concerns about the economy, it is likely that the Thames Gateway will continue to attract major development schemes to the area. The existing 'pipeline' of major projects, many of which are proposed for delivery within the next 10-15 years, could together require more than 50 million tonnes of construction material to be delivered to site – the equivalent of 1,000 lorry loads per day for 10 years.
- 6.1.2 The concern is that most construction sites in London, even those located alongside the River Thames and its tributaries and/or the rail network, continue to be served almost exclusively by road transport. Whilst in some cases the nature of the development or access arrangements may necessitate use of road transport, the initial appraisal of schemes within this study suggests that only the very large developments (eg the Olympics Village and Crossrail) have made any serious attempt to use alternative modes.
- 6.1.3 Furthermore, the opportunities to consolidate construction material flows, and in turn minimise construction traffic, again seem to be restricted to very large developments (eg Heathrow), or to those benefiting from the publicly-subsidised LCCC project in Bermondsey.
- 6.1.4 It is apparent that consolidation of construction material flows can generate significant direct and indirect benefits, as outlined in this report. Larger schemes may have greater opportunities to promote such measures, for example through greater economies of scale, procurement power or developer contributions. However, the emerging concern from this initial scoping study, and the recent River Thames Event, is that other schemes which could also benefit from similar initiatives are not pursuing such measures, possibly due to a lack of understanding and awareness of the opportunities which exist.

6.2 Recommendations

- 6.2.1 The priority in the short term must be to raise awareness of the opportunities to consolidate construction material deliveries, and improve dialogue between material suppliers, contractors and developers. A networking event along the lines of the recent successful FQP River Event should be progressed. The toolkit materials produced by the West London FQP could usefully complement an updated FQP Resource Sheet on construction issues, to provide an information pack to circulate to relevant stakeholders.
- 6.2.2 In addition, examination of a small selection of recent planning applications shows that there is an urgent need to implement TfL's proposed Construction Logistics Plans (and their integration with Site Waste Management Plans), to review delivery arrangements for construction sites, to inter alia minimise vehicular traffic. It is recommended that a simple checklist is produced which could be piloted through Borough(s) as part of the existing planning and development control process.
- 6.2.3 Opportunities for pilot projects to be considered for the 2009/10 work programme include:
- A joint delivery strategy between existing co-located suppliers, to consolidate deliveries by road to construction sites, to create 'virtual' consolidation centres;
 - Use of mobile self-discharging barges and/or trains to enable large volumes of construction materials to be delivered direct to riverside / rail-linked sites.