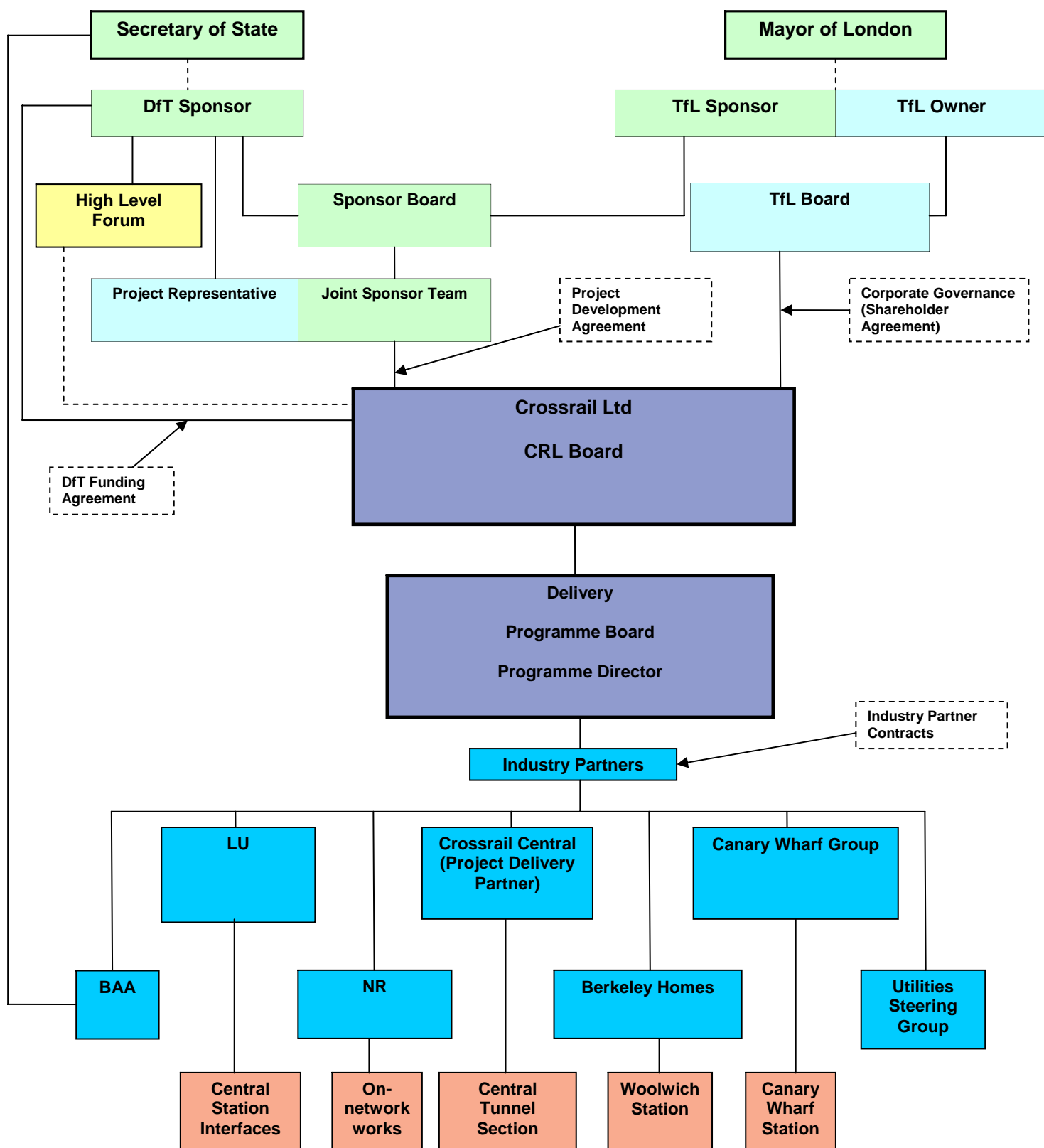


# Crossrail Governance Organisation for Delivery



## **Introduction**

The Crossrail Programme will be delivered within a complex stakeholder environment. This document, together with the diagram above shows how the governance and delivery structure within Crossrail Ltd (CRL) is being developed to achieve this.

## **Sponsors**

The Project has two Sponsors, the Department for Transport (DfT), which reports to the Secretary of State for Transport (SOS), and Transport for London (TfL), which reports to the Mayor of London. The Sponsors act as the clients for the Crossrail Programme, including specifying the delivery requirements, and have established a Sponsor Board (SB) as the forum in which they make joint decisions in relation to the Programme. The SB is managing the early development of the Programme through a series of Review Points where the Programme is reviewed by the Treasury's Major Projects Review Group to ensure that specified milestones are being achieved. The CRL Executive Directors report regularly to the SB, as required by the Sponsors. At working level, the Sponsors have set up a Joint Sponsor Team (JST) to work with CRL to implement their decisions.

## **Project Representative**

The Project Representative (P Rep) has been appointed by the JST to assist the smooth running of the Crossrail Programme. The role of the P Rep is defined in the Project Development Agreement (PDA) and includes:

- Advising the Sponsors on any increased risk of exceeding budget and timescale
- Providing independent informed advice to the Sponsors on progress in terms of time, cost and quality.
- Providing the Sponsors with oversight and analysis of any changes in scope
- Monitoring CRL's compliance with undertakings and assurances
- Reviewing CRL's reports to the Sponsors
- Advising the Sponsors about the capability and level of resources deployed on the Crossrail Programme.

## **Parent Company**

CRL is a wholly owned subsidiary of TfL. As owner, TfL has legal responsibility for CRL's corporate governance. Consequently, CRL is subject to TfL's corporate governance arrangements. Certain authorities are delegated by TfL through Standing Orders to the Chief Executive and Finance Director of CRL. The delegations are currently very limited in relation to the scale of the Crossrail Programme. Following the Sponsors' acceptance of the final version of the Delivery Strategy, the TfL Board will delegate to the CRL Board authority to implement the Delivery Strategy, subject to the constraints of the Project Agreements. The CRL Board is accountable to the TfL Board for compliance with their governance arrangements.

## **Delivery Agent**

CRL was appointed as the principal Nominated Undertaker for the Programme under the Crossrail Act, and as such will act as the Delivery Agent for the Programme. The management and implementation of the Crossrail Programme is CRL's ultimate objective, and it is the responsibility of the CRL Board to ensure delivery of this objective.

## **Delivery Partners**

CRL has appointed two Delivery Partners to assist with delivery of the Crossrail Programme:

- The Programme Partner (PP) who supports the overall delivery of the Programme route wide and
- The Project Delivery Partner (PDP) responsible for the delivery of the Central Section Works.

## Industry Partners

CRL has a number of Industry Partners; London Underground (LU), Network Rail (NR), Rail for London (RfL), Canary Wharf Group (CWG), Berkeley Homes (BH), and Docklands Light Railway (DLR). A number of utility companies have similar but less formal involvement with the Programme and meet together in the Utilities Steering Group. These Partners have varying roles and responsibilities, including delivery of specific sections of the Crossrail Programme, management of system and project interfaces during construction and management, and operation and maintenance of the system when complete. Crossrail manages its relations with these organisations through a Programme Board, to which subsidiary bilateral interface boards report, and through the Utilities Steering Group.

## Governance

### CRL Board

The CRL Board and the CRL governance structure have been developed in accordance with the requirements of the Sponsors' Agreement and the TfL Shareholder Agreement.

The Board comprises three Executive Directors, five independent Non-Executive Directors (including the Chairman) and two nominated Non-Executive Directors (appointed by the Sponsors). The Directors are:

- Chairman Terry Morgan CBE,
- Chief Executive Rob Holden CBE,
- Executive Directors
- Finance Director David Allen,
- Programme Director Andy Mitchell
- Non-executive Directors
- Michael Cassidy CBE
- Patrick Crawford
- Sir Joe Dwyer
- Heather Rabbatts CBE
- Sir Mike Hodgkinson – TfL nominee
- Robert Jennings CBE – DfT nominee

The Board meets twelve times a year on a twenty-eight day cycle - no meetings are held in August. It operates in line with the governance regime established by the TfL Shareholder Agreement, including TfL's Standing Orders and the Memorandum and Articles of Association adopted when the company became a wholly owned subsidiary of TfL.

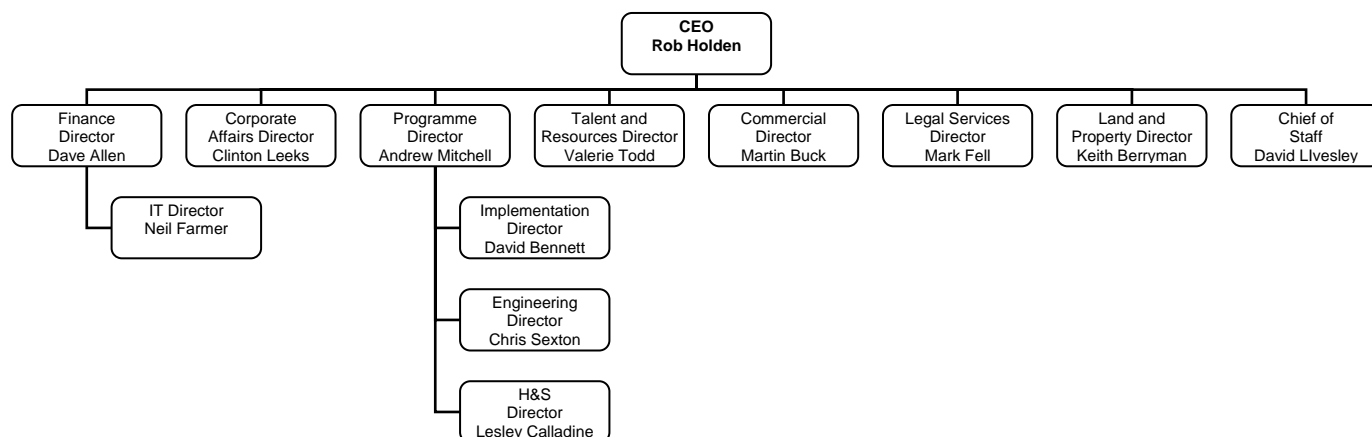
The Board has been established as an independent body, through the provision of independent non-executive directors, and is responsible for the overall direction and management of CRL to deliver the Programme in accordance with the Project Development Agreement (PDA) and other programme agreements. The Board Regulations, as approved from time to time, set out the arrangements for the conduct of its business, including the establishment of Board Committees.

The CRL Board is ultimately responsible for providing assurance to the Sponsors. The ability to provide this assurance comes from the structures, procedures and processes which the Board establishes. In particular, the Board has established a series of Board Committees and an appropriate organisational structure has been identified, to be led by a senior management team which is now largely in place. Reporting procedures have been established and agreed with the Sponsor Board including Periodic Reports, Semi-Annual Reports and a series of Project Review Points have been established. CRL has an internal audit function which carries out a programme of audits agreed with the Audit Committee.

## CRL Board Committees

The Board has established the following Committees: Executive, Health, Safety and Environment, Property, Audit, and Nominations and Remuneration. Terms of Reference for each Committee are appended to the Board Regulations which have been adopted by the CRL Board.

### Executive Committee



## Delivery

### Senior Management

The Programme is managed by the Programme Director, Andy Mitchell, who is one of the three Executive Directors on the CRL Board. He is supported by the Implementation Director, David Mitchell, who will manage the delivery of the Central Tunnelled Section through the Project Delivery Partner.

### Programme Partner

Transcend, an AECOM/CH2M Hill/Nichols Group joint venture has been appointed as the Crossrail Programme Partner (PP). CRL and the PP work together as an integrated Programme Delivery Team to provide Programme and Project controls and engineering management. Within the Programme Delivery Team, the CRL Implementation Director has specific responsibility for the management of the PDP;

### Project Delivery Partner

The Project Delivery Partner (PDP), a Bechtel joint venture with Halcrow and Systra, is responsible for the safe delivery of the Central Section Works to schedule, specified quality and budget. In doing so, it will be responsible for the programme management of the contractors responsible for the construction of the Central Section Works and the interfaces with NR, LU, DLR, CWG and BH.

### Industry Partners

The Industry Partners are responsible for delivering specific parts of the Programme, management of the interfaces and management, operation and maintenance of the system when complete.

A Programme Board has been established comprising CRL together with NR, LU and Rail for London (the Industry Partners responsible for delivering the most extensive contributions to the Crossrail Programme).

## **Network Rail**

NR has three primary roles in the Crossrail Programme:

- to undertake the On-Network Works (ONW),
- to undertake works directly for CRL at the interfaces between the On-Network Section and the Central Section Works; and
- to act as Operator and Infrastructure Manager for both the On-Network Section and the railway systems in the Central Section Works

## **London Underground**

LU has three primary areas of involvement with the Crossrail Programme:

- works affecting the Underground;
- the protection of LU's assets from CRL works in the vicinity;
- the transfer of responsibility for five stations to LU as Infrastructure Manager - Bond Street, Tottenham Court Road, Farringdon, Liverpool Street and Whitechapel.

## **Canary Wharf Group**

CWG is responsible for the financing, design and construction of the Canary Wharf Crossrail station in the North Dock at Canary Wharf.

## **Berkeley Homes**

The Sponsors have finalised an agreement with Berkeley Homes (East Thames) Limited, as contractor, and Berkeley Homes PLC, as guarantor, to develop and part fund the Woolwich station box. CRL will be responsible for managing the works and related interfaces at a Programme level. The Steering Group is chaired by CRL's Land and Property Director.

## **Rail for London**

RfL will be:

- the Infrastructure Manager and Operator of Paddington, Canary Wharf (Crossrail), Custom House and Woolwich stations;
- the owner of the operating cost model and procurer of the Train Operating Company (TOC) to operate Crossrail services.

## Crossrail Strategic Risk Register

Title/ Description	Current			Forecast		
	Probability	Impact	Severity	Probability	Impact	Severity
<p>Delay or withdrawal of funding</p> <p>Some elements of the funding for Crossrail may be delayed or not available.</p>	Medium	Severe		Medium	Severe	
<p>Inflation increases above forecast</p> <p>As the recession eases, inflation could increase above the current forecast, resulting in an increase in the outturn cost of the programme.</p>	Medium	Severe		Medium	Major	
<p>Failure to gain Sponsors approval at Review Points 3b and 4</p> <p>Failure to gain Sponsors approval at Review Points 3b and 4 could result in delay, additional costs or ultimately cancellation of the programme.</p>	Low	Severe		Very Low	Severe	
<p>Failure to establish and maintain an acceptable baseline</p> <p>The baselining work which is currently underway may result in an increase in the projected cost or schedule outcomes.</p>	Low	Severe		Very Low	Severe	
<p>Catastrophic high profile failure of the works in Central London</p> <p>There may be a catastrophic, high profile failure of Crossrail or other similar works in Central London either during construction or during commissioning of the railway. This could be the collapse of a building or a tunnel similar to the Cologne tunnel collapse in March 2009.</p>	Very Low	Severe		Very Low	Severe	
<p>Transition of financial systems</p> <p>The transition of financial systems from SAGE to SAP could be delayed</p>	High	Major		Very Low	Major	
<p>Interface with Industry Partners</p> <p>CRL may be unable to influence Industry Partners to perform their obligations on time and to budget.</p>	Medium	Major		Low	Minor	
<p>Interface with wider stakeholder population</p> <p>There is a risk that stakeholder expectations are not met and goodwill is lost resulting in loss of confidence in the programme and potential delays.</p>	Low	Major		Very Low	Major	
<p>Sponsors requirements are not clearly defined</p> <p>Sponsor may not accept the design at RP4 if it cannot be proved that the scope delivers the Sponsors and functional requirements</p> <p>Note that the description of this risk is currently being developed</p>	Low	Major		Low	Moderate	

Title/ Description	Current			Forecast		
	Probability	Impact	Severity	Probability	Impact	Severity
Planned performance of the integrated railway system is not delivered  There is a risk that planned performance of the integrated system cannot be delivered in accordance with section 3.1.4.3 of the Sponsors Requirements (i.e. 95% PPM with 1% cancellations) by the future operator RfL with a workable maintenance and operations regime in the context of the entire railway over its life.	Very High	Moderate		Low	Moderate	
Sponsors' Acceptance of Contracting Strategy  Sponsors concern about the use and application of NEC Contract (Target Cost Option) results in failure to approve either the Delivery Strategy or subsequent major procurements executed on this basis.	Medium	Moderate		Low	Moderate	
Woolwich Station fails to progress as planned  Work at Woolwich station could fail to progress as planned.	Medium	Moderate		Very Low	Moderate	
Business Continuity  CRL may not be able to respond effectively to an incident which threatens the continuity of the programme and operations could be disrupted for an extended period of time	Low	Moderate		Very Low	Insignificant	



ID	Activity / Objective	Description
681	L1.2.PST.PO.CR.PML - Pudding Mill Lane Portal	<p>City Mill Bridge construction late</p> <p>Completion of City Mill River bridge construction in time for the ODA to construct the southern pedestrian walkway into the Olympic Park prior to the Olympic Games</p>
1041	L1.5.ALL.ZA.CR - On Network Works	<p>Cost of ONW exceeds £2.3b funding available</p> <p>Cost of On Network Works exceeds £2.3Bn available funding.</p> <p>Network Rail Cost Plan for On Network Works exceeds CRL target of £2.3Bn following the Joint Working exercise to agree the basis of the Baseline and through the process to agree the Overall Target Price on 1 September 2010.</p>
1066	L1.5.ALL.ZA.CR - On Network Works	<p>CRL/NR relationship deteriorates</p> <p>The relationship between CRL and NR may be damaged, e.g. by a mismatch in expectations on the scope or price of the On Network Works</p>
1111	L1.5.ALL.ZA.CR - Programme Controls	<p>Validate supply chain estimate</p> <p>Supply chain estimates for Central Section Works is provided late and that the estimates exceed budget.</p>
1844	L1.2.STA.ST.CR.WHI - Whitechapel Station	<p>Sainsbury Escalating costs.</p> <p>There is a risk that Sainsbury will go above the approved change amount.</p>
2376	L1.2.PST.PO.CR.PML - Pudding Mill Lane Portal	<p>Network Rail fail to agree on gradient and trackform design at Pudding Mill Lane</p> <p>Network Rail fail to agree on a gradient and trackform for the Puding Mill Lane portal causing the design and construction to miss the Olympic Games deadline</p>
1061	L1.5.ALL.ZA.CR - On Network Works	<p>Performance modelling of the Crossrail train service to achieve 95 PPM as required</p> <p>Performance Modelling CRL is unable to achieve the required outputs as specified in the Sponsor s Requirements. The system performance timetable modelling workstream may identify that the current scope will not deliver reliable capacity.</p>
684	L1.2.PST.PO.CR.PML - Pudding Mill Lane Portal	<p>Failure to pass internal gate reviews to support tender and construction - City Mill Bridge</p> <p>Internal gate reviews cannot be passed, contracts cannot be awarded and construction work cannot be started without Network Rail s and approval of the NR City Mill River bridge design.</p>



ID	Activity / Objective	Description
679	L1.2.PST.PO.CR.PML - Pudding Mill Lane Portal	<p>400kV cable diversion outage missed</p> <p>The 400KV cables cannot be diverted during the power outage period as the civils work undertaken by CRL is not complete.</p>
680	L1.2.PST.PO.CR.PML - Pudding Mill Lane Portal	<p>DLR replacement works late</p> <p>Major structural elements of the DLR replacement works which border the ODA Southern Entry plaza are not completed as per agreement with the ODA in time for the Olympic Games.</p>
945	L1.5.ALL.ZA.CR - Health and Safety	<p>Zero accident culture is not embeded</p> <p>This is not built into the newly developing Crossrail culture and as a result will be paid lip service to as a vision statement</p>
946	L1.5.ALL.ZA.CR - Health and Safety	<p>Behavioural safety processes prove ineffective</p> <p>The zero accident culture is not believed or taken seriously</p>
754	L1.2.PST.TU.CR - Tunnels	<p>Connaught Tunnel complexity</p> <p>It may prove extremely hazardous to enlarge Connaught Tunnel to meet CRL s requirements.</p>
1051	L1.5.ALL.ZA.CR - On Network Works	<p>NR Performance</p> <p>NR Performance NR fails to perform its responsibilities and accountabilities to CRL for the On Network Works. Specifically, in respect of the NR Programme and NR Client Requirements.</p>
1219	L1.5.PST.RS.CR - Rolling Stock & Depots	<p>Train effeciency</p> <p>Train/platform interface will not provide the best method of passenger boarding/alighting</p>
1225	L1.5.PST.RS.CR - Rolling Stock & Depots	<p>Secure funding</p> <p>Appropriate financing arrangements for trains and depot cannot be achieved</p>
1097	L1.5.ALL.ZA.CR - Operations	<p>NR Contingency Plan</p> <p>Crossrail doesn t work / can t be operated as planned when it opens for public service in 2017 . Consequently NR needs to revert to previous operational practices, until Crossrail teething problems are resolved.</p>
755	L1.2.PST.TU.CR - Tunnels	<p>TBM hits uncharted well</p> <p>Without a co-ordinated approach the project has an unacceptable residual risk of hitting or destabilising an uncharted well.</p>

ID	Activity / Objective	Description
810	L1.2.STA.ST.CR.LIS - Liverpool Street Station	<p>Services to banks</p> <p>Power or UBS bank systems, including comms systems, may be disrupted to UBS affecting bank trading on an international basis. £1.4B daily trading through UBS cited by the bank. (CC RISK)</p>
879	L1.5.ALL.ZA.CR - Engineering	<p>Risk profile and programme</p> <p>The project is required to comply with the Infrastructure TSI when adopted by the EU.</p>
996	L1.5.ALL.ZA.CR - London Underground	<p>Delay in station acceptance by LU</p> <p>CRL designs for stations which LU will become Infrastructure Manager, are not accepted by LU in a timely manner.</p>
1002	L1.5.ALL.ZA.CR - London Underground	<p>Demand Forecast changes</p> <p>The Demand Forecast figures will change.</p>
835	L1.2.STA.ST.CR.WOO - Woolwich Station	<p>Funding for Woolwich not agreed</p> <p>A deal cannot be agreed in time between the Sponsors and Berkeley Homes for funding of the Woolwich station box project enabling it to go ahead in Feb.2010.</p>
1092	L1.5.ALL.ZA.CR - Operations	<p>Functional Requirements</p> <p>There will be a rapid de-scoping exercise carried out by CRL.</p>
1133	L1.5.ALL.ZA.CR - Quality Assurance	<p>CRL Management System</p> <p>the management system will not be a reliable source of process and procedural information</p>
1134	L1.5.ALL.ZA.CR - Quality Assurance	<p>Departmental policies</p> <p>CRL departments continue to operate in isolation</p>
1148	L1.5.ALL.ZA.CR - Rail for London	<p>Future-proofing</p> <p>The importance of future operations for Crossrail will not be sufficiently prioritised and managed</p>
1087	L1.5.ALL.ZA.CR - On Network Works	<p>To prepare comprehensive documentation for the basis of the baseline</p> <p>1. Agreement will not be reached on the base documentation for pricing.  2. No comprehensive and internally consistent documentation will be prepared  3. Network Rail will do their own thing and price what they want to price, leaving CRL to sort out issues once a Target Price is submitted</p>
1048	L1.5.ALL.ZA.CR - On Network Works	<p>ERTMS decision required</p> <p>ERTMS Works will be delayed because the implementation of ERTMS in the British network is unproven and it is possible that ERTMS on the Crossrail route may not be commissionable for 2017.</p>
1050	L1.5.ALL.ZA.CR - On Network Works	<p>Integration ONW/CSW</p> <p>The ONW and CSW are not fully integrated.</p>

ID	Activity / Objective	Description
1840	L1.2.STA.ST.CR.WHI - Whitechapel Station	ELL - Working Platform  Site activity for the working platform carries beyond April 4th 2010
871	L1.5.ALL.ZA.CR - Engineering	Baseline requirements  The design prepared by NR and the PDP will not reflect CRL requirements
1034	L1.5.ALL.ZA.CR - Olympic Delivery Authority	Olympic Route Network  ODA s use of Olympic Route Network (ORN) powers causes detrimental impact upon CRL logistics and works.
884	L1.5.ALL.ZA.CR - Engineering	Delivery of Central Section signalling works  a) Works will be delayed because the implementation of ERTMS in the British network is unproven and it is possible that ERTMS on the Crossrail route may not be commissionable for 2017. b) Central Station Works signalling development is required to meet Sponsors Performance Requirement
980	L1.5.ALL.ZA.CR - Oversight Development	Weak Property Market  The property market will not recover to 2006/07 levels when the TfL target was set by the time of site disposal (2016/2017).



# Crossrail Responsible Procurement

## Contents

Encouraging a diverse base of suppliers.....	2
Promoting fair employment practices .....	2
Promoting workforce welfare .....	2
Meeting strategic labour needs and enabling training opportunities .....	2
Community benefits .....	3
Ethical sourcing practices .....	3
Promoting greater environmental sustainability .....	3

**Encouraging a diverse base of suppliers**

We will continue our commitment to the GLA Group Statement of Principles on Supplier Diversity.

We will provide ongoing engagement and support to the Diversity Works for London Programme, which promotes greater supplier diversity in the private sector.

We will explore opportunities for working with voluntary and community sector organisations in supply and service delivery.

Our ongoing programme of reviewing our procurement processes will seek to ensure they remain transparent and open to the whole of the supplier community.

'Diverse Suppliers' comprises the following four sub-sets:

- Small and Medium Enterprises
- Black, Asian and Minority Ethnic businesses
- Suppliers from other under-represented or protected groups
- Suppliers demonstrating a diverse workforce composition

**Promoting fair employment practices**

Our ongoing programme of contract review will seek to ensure we move towards a position that, where appropriate, our contractors' staff receive a fair wage reflecting the environment in which they work, and that they enjoy contractual terms which represent reasonable minimum standards and which provide for family friendly, flexible and diverse working environments.

We will support the ongoing work of the GLA's Living Wage Unit in monitoring the development and implementation of a London Living Wage Policy.

We will seek to promote the benefits of adopting fair employment practices through the supply chain to our partner organisations, suppliers and the market.

**Promoting workforce welfare**

Our ongoing programme of contract review will seek to ensure that wherever appropriate, our contract terms require our suppliers to make provision for the welfare of their workforce.

We will seek to work with suppliers who do not prevent or discourage employees from joining trade unions or discriminate against employees who hold trade union membership.

**Meeting strategic labour needs and enabling training opportunities**

We will seek to incorporate provisions into our contracts, where appropriate, to offer training and employment opportunities for London's communities and to address under-representation of particular groups in particular sectors, and the need for providing skills and opportunities for people experiencing long-term unemployment.

We will work with our suppliers to ensure that wherever appropriate employment opportunities arising from our contracts are communicated to local communities. (see Theme 1)

## **Community benefits**

We will take measures to understand the impact our procurement activities have on local communities.

We will encourage a positive contribution from our suppliers to the local communities in which they work on our behalf.

We will fully explore the opportunities for developing appropriate contractual provisions to deliver specific community benefits.

## **Ethical sourcing practices**

When sourcing suppliers for our contracts we will seek to work with suppliers who:

- Afford their employees the freedom to choose to work for them. Employees should be free to leave the supplier after reasonable notice is served. Suppliers should not use forced, bonded or non-voluntary prison labour;
- Establish recognised employment relationships with their employees that are in accordance with their national law and good practice. Suppliers should not seek to avoid providing employees with their legal or contractual rights;
- Can demonstrate a commitment to equality of opportunity for individuals and groups enabling them to live their lives free from discrimination and oppression;
- Impose working hours on their staff which are compliant with national laws or industry standards;
- Under no circumstances abuse or intimidate, in any fashion, employees and have appropriate disciplinary, grievance and appeal procedures in place;
- Work within the laws of their country;
- Take appropriate measures to ensure the health and safety of their workforce and the wider public;
- Support our view that the long-term elimination of child labour is ultimately in the best interests of children, and have taken measures to ensure that child labour is not utilised in their operations;
- Do not support, encourage or facilitate the trade in drugs, arms, tobacco, slavery or prostitution; and
- Offer wages and benefits that at least meet relevant industry benchmarks or national legal standards.

We will encourage ethical sourcing practices among our suppliers, partner organisations and the broader market.

## **Promoting greater environmental sustainability**

In promoting greater environmental sustainability through procurement we will:

- Continue our commitment to the Mayor of London's Green Procurement Code, to ensure that environmental issues are proactively addressed in all aspects of the procurement process and monitor our progress in this area;
- Seek to reduce waste through reviewing the amount and type of materials purchased, and by exploring the opportunities to purchase refurbished, recycled and recyclable equipment, products and materials;

- Source green energy wherever possible and adopt appropriate energy management measures across all GLA Group sites;
- Ensure that goods purchased by the GLA Group derive from natural sources where appropriate, do not have an adverse effect on the environment, and comply with EU and international trading rules;
- Purchase organic and Fair-trade food and drink where practicable;
- Ensure that vehicles purchased have low emissions of local air pollutants and climate change gases, and take account of the need to minimise emissions and exposure to air pollution in purchasing goods and services;
- Develop appropriate procurement frameworks to support the implementation of the Mayor's Ambient Noise, Air Quality, Biodiversity, Energy and Waste Strategies, and sustainable corporate working practices including on asset disposal; and
- Where appropriate, examine the environmental management practices of our current and potential suppliers.

## Executive Summary

In previous reviews the Sponsors have endorsed the shape of the CRL organisation to deliver the Crossrail project. Acceptance of the Draft Delivery Strategy (incorporating the Procurement Strategy) in September 2008 provided the basis for appointment of the Project Delivery Partner (PDP) and Programme Partner (PP), together with the award of the design and enabling works frameworks. In June 2009, the Review Point 2.5 Procurement Strategy was accepted by the Sponsors. This updated Procurement Strategy needs to be read in the context of the Delivery Strategy for Review Point 3A.

### Purpose

This Procurement Strategy sets out the principles upon which CRL, together with the PP and PDP, will proceed with the procurement of all elements of the Crossrail project. This Procurement Strategy is not subject to change without Sponsor approval.

This strategy document includes, at Appendix B, at the Sponsors' request, aspects of strategic planning which represent our current working assumptions to help the overall approach. It should be noted that this is a living document which will develop over time as the package specific procurement planning process proceeds.

## Procurement Strategy

### Focus on Cost and Risk

CRL's approach in setting out this Procurement Strategy is to place cost and risk management at the centre of the process. Our aim is to challenge cost and mitigate risk in every phase and at every level within the project, whilst being alert to opportunities where they exist.

### Strategic Risks

CRL recognises that strategic risks, such as funding and other investments beyond Crossrail, are being managed by the Sponsors, other Industry Partners and stakeholders. The strategy provides for all procurement plans to take account of the strategic risks, identify opportunities for mitigation or other opportunities for flexibility where they exist.

### Appraisal

This strategy provides that the procurement of each element of the project is appraised through the development of a procurement plan. The appraisal will be undertaken in accordance with the principal considerations set out in section 3 with option selection based on ensuring best value.



### **Procurement process**

Procurement processes will be undertaken in accordance with CRL's procurement management processes, compliant with all relevant European procurement legislation, UK Government regulations and TfL procurement policies.

### **Industry Partners**

The strategy for procuring those elements of the Crossrail project related to Industry Partners is substantially determined by the incumbent positions of those partners and the agreements already in place. CRL is working collaboratively with its Industry Partners to ensure that CRL has visibility of the respective procurement processes and is able to assure the adequacy of Industry Partner activities at every stage of the process. CRL is proactively engaged with Industry Partners to identify and mitigate risk through the procurement process.

### **Assurance**

CRL is committed to ensuring a high level of engagement and transparency for the Joint Sponsor Team and Sponsors.

CRL provides assurance to Sponsors through its core business processes, the CRL project processes (through PP and PDP), the project delivery processes and the in-depth experience and capability, supported by the expert panel, across the integrated CRL team.

## 1 Introduction and Background

The aim of the Procurement Strategy is to identify the preferred way of delivering the Crossrail project objectives in a manner that ensures value for money.<sup>1</sup> This includes the main priority to deliver within the Total Sponsor Committed Funding<sup>2</sup>. The strategy has been aligned with the vision, values, priorities, constraints, the broader policy environment and current procurement best practice advice. The Procurement Strategy is also to be compatible with the financing model,<sup>3</sup> which formed the basis of the Crossrail funding solution, and must deliver contract expenditure profiles within the available funds. The funding solution is highly customised, reflecting the scale and complexity of Crossrail.

The development of the funding solution followed earlier work which looked at different funding options, including the Montague Review in 2004. This concluded that in relation to procurement, the adoption of a concessionaire solution would be unlikely to provide satisfactory risk transfer for the additional costs incurred. The Review also concluded that target price contracts, supported by robust project client and project management arrangements, would be the appropriate way to deliver a project of this complexity. Further work was considered necessary to determine an appropriate structure and target price.<sup>4</sup>

Crossrail was considered as a programme of works and funding solutions were selected that best fitted the individual elements of this programme. This work informed the development of the funding arrangements set out in the 2007 Comprehensive Spending Review. The solutions that emerged in turn defined the delivery strategies for major components of the project equal to £3.3 billion of the total out-turn expenditure (£15.9 billion). The procurement strategy has been developed on the basis of these funding solutions. These strategies are:

- On-Network Works to be financed and delivered by Network Rail;
- Canary Wharf Station to be a Design Build Finance and Operate (DBFO) contract on a long term lease with an option to buy;

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<sup>1</sup> Sponsors' Requirements cl.2.2.1

<sup>2</sup> Project Development Agreement cl1.1

<sup>3</sup> PDA - Schedule 7

<sup>4</sup> Review of the Crossrail Business Case – July 2004 (The Montague Review – Conclusion 4; Procurement

- Woolwich Station box to be constructed by Berkeley Homes (at no net cost to CRL);
- All other work to be procured under Client funded contracts;
- Rolling stock shall not be funded by the Sponsor Committed Funding; and
- Depot shall not be funded by the Sponsor Committed Funding and may be linked to the rolling stock contract.

In July 2008 the Crossrail Bill was given Royal Assent and it has now become the Crossrail Act 2008. Following this, in September 2008, Sponsors and MPRG accepted the interim Delivery Strategy for the purposes of moving forward with key procurement activities necessary to put in place the delivery resources critical to the achievement of the programme. In June 2009 the Review Point 2.5 Procurement Strategy was accepted by the Sponsors. This updated Procurement Strategy needs to be read in the context of the Delivery Strategy, for Review Point 3A.

The Programme Partner contract was awarded to Transcend (Aecom, CH2M Hill and Nichols) on 27 March 2009. Subsequently, the Programme Delivery Partner contract was awarded to Bechtel on 17<sup>th</sup> April 2009. The main role of the Programme Partner is to work with CRL as part of an integrated Programme Delivery Team. The main role of the Project Delivery Partner is to manage the delivery of the central section through London together with network wide system requirements.

In March 2008 the Sponsors agreed to the commencement of the procurement of new Design Consultancy Frameworks which will provide the design resource needed to develop the detailed design of project requirements. As such, frameworks have been established with a number of Design Consultants under a series of design categories and specific design contracts are being placed under these frameworks. Frameworks have also been placed for the provision of enabling works under three categories. Contracts for specific pieces of enabling works will be placed under these frameworks.

Crossrail is a complex programme of interrelated works that must combine to deliver a rail service. CRL is responsible for development and delivery of the new infrastructure, in accordance with the requirements of the Sponsors, up to the point at which it is accepted by the long-term operators of the infrastructure. This includes the responsibility for procuring the following works and services:

#### **Central Core Area Works (Central Section Works)**

The Crossrail Project Works between Royal Oak and Pudding Mill Lane and between Royal Oak and Plumstead including:

Delivery and Signalling Contracts such as:

- Track;
- Signalling and control;
- Stations (including associated works needed for oversight development);



- Running tunnels and shafts.
- Enabling works and utilities;
- Communications and control systems;
- Route control centre; and
- Traction power.

### On-Network Works

Crossrail Project Works undertaken by Network Rail between Maidenhead and Royal Oak, Pudding Mill Lane and Shenfield and Plumstead and Abbey Wood (refer DfT/TfL letter to Network Rail dated 18<sup>th</sup> July 2007).

The scope of these works includes:

- Infrastructure modifications and enhancements;
- Station modification and upgrades;
- Signaling and control; and
- Stabling.

Network Rail is also responsible for carrying out the implementation and asset protection works under the Implementation and Asset Protection Agreements where the Central Section Works are required on or proximate to Network Rail assets.

London Underground is responsible for delivering interface works between CRL and LU under the CRL-LU Development Agreement.

**Canary Wharf Station** – The Secretary of State and CRL have a Development Agreement with Canary Wharf Properties (Crossrail) Limited (guaranteed by Canary Wharf Group Plc) to develop finance and part fund the new Canary Wharf (Crossrail) Station. The Agreement includes provisions for CRL and CWP to agree the plans and for CWP to provide access for the main tunnelling and subsequent railway works. CWP has appointed Expanded Limited for the construction of the Canary Wharf station. Physical work commenced in May 2009.

**Woolwich Station** – An Agreement with Berkeley Homes for the design and construction of the station Box (the Station Box Deed) was signed, in February 2009. The Agreement is currently held in escrow until the outcome of a planning application and resolution of the Warren Lane shaft issue. The agreement with Berkeley Homes provides for future arrangements to be made for the fitting out of the station.

**Vehicle Fleet** - the PDA makes CRL responsible for the overall management of rolling stock procurement and requires CRL to develop a procurement strategy for the rolling stock in consultation with TfL and RfL and for the Sponsors to develop, in consultation with CRL, a programme for financing for the procurement of the rolling stock.<sup>5</sup>

**Depot Facility** – the PDA makes CRL responsible for the overall management of depot procurement and requires CRL to develop a procurement strategy for the Depot and for the Sponsors to develop, in consultation with CRL, a programme for financing procurement of the Depot. It may be linked to the procurement of the rolling stock.<sup>6</sup>

**Oversite Developments** - the Secretary of State (SoS) has entered into five agreements with existing landlords of properties to be acquired for the project. The agreements provide for a joint venture approach to redeveloping the sites with a shared return based on the uplift value achieved. Oversite development at a further 13 sites will be developed by CRL.

**Docklands Light Railway (DLR)** – CRL are finalising a series of agreements with DLR for replacement and interface works necessary to implement the Crossrail scheme.

A Lessons Learnt report for a series of recent comparable projects was prepared to inform the thinking behind the strategy. This report is contained at **Appendix C**.

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<sup>5</sup> PDA cl.8

<sup>6</sup> PDA cl.9

## 2 Objectives, Principles and Legal Framework

### 2.1 Objectives

The five overarching objectives of the Procurement Strategy are:

- To support the achievement of the Crossrail vision and project objectives through the implementation of the Crossrail Delivery Strategy to be accepted by the Sponsors;
- To focus on risk;
- To deliver to the public sector best value obligations including policies on matters such as Responsible Procurement;
- To ensure compliance with Procurement Regulations; and
- To promote a zero accident culture.

It is Crossrail's role to provide assurance to the Sponsors that these objectives are achieved through the procurement process which is managed by the PDP and the Industry Partners.

The Crossrail vision was agreed by the CRL Board on 17 October 2006. The vision is: **'A world class, affordable railway delivered through effective partnerships and project excellence'**.

The Crossrail project aims and objectives are given in a set of documents that form a requirements hierarchy. The key documents are:

- *Project Development Agreement;*
- *Sponsors' Requirements; and*
- *Crossrail Project Functional Requirements, including the Train Performance Requirements.*

The Sponsors' Requirements include the following objectives for the Crossrail project at clause 2.2.1

- The statement of objectives for the Crossrail Project set out in Appendix 1 of the Sponsors' Requirements;
- The planning, construction, commissioning and implementation of service shall be consistent with the Government's overall approach to the provision of major transport infrastructure, and the Mayor's plans for the development of the capital's infrastructure;
- The Project shall support the SoS's plans for public transport provision, in particular in relation to the manner in which it interfaces with other existing and future transport schemes, and shall be integrated with the Mayor's transport and sustainability strategies;
- Value for money shall be provided at every stage of the Project;



- Robust cost control mechanisms shall be in place throughout the lifetime of the Project;
- Except to the extent that is set out in these Sponsors' Requirements, CRL shall ensure that the design and delivery of the Project shall be such as to achieve the Design Capacity at the Final Delivery Date, i.e. no later than the Target Final Delivery Date. However, the Sponsors may Affirm proposals by CRL that would result in the Project delivering capacity which may be less than the Design Capacity but shall not be less than the Opening Capacity;
- The Project shall be developed, designed and constructed in a way that optimises whole life cost on the basis of an appraisal period of 50 years from the Target Final Delivery Date and TfL Business Case Development Manual assumptions as to methodology and discount rates, except that such analysis in respect of On-Network Works shall be undertaken with reference to NR's equivalent procedures and parameters;
- Quality assurance, environmental assurance, safety and security regimes shall be established to be implemented during the phases of construction, commissioning and service operation;
- In all circumstances the design of the Crossrail Project shall comply with all Applicable Laws and Applicable Standards including, but not limited to, those pertaining to safety, security, interoperability, the environment and provision for those with disability;
- World-class levels of performance and reliability shall be delivered;
- CRL shall co-ordinate the activities of parties to the Crossrail Project to deliver pro-active and consistent communications and relations with stakeholders, the media and local communities; and
- All outputs shall be achieved for a minimum of 50 years from the first stage of Crossrail operations, including from the first stage of public operations, starting no later than the Target Final Delivery Date, and allowing for increased use of the system and the requirements for maintenance and renewal of Crossrail Assets over this time period.

## 2.2 Procurement Policy and Principles

### 2.2.1 Sources and Principles

The procurement strategy will be compliant with:

- The Mayor for London's Strategies for London and TfL policies; and
- European Procurement Directives and implementing Regulations.

The strategy has been developing taking account of:

- OGC Achieving Excellence in Construction Guides, Common Minimum Standards and fair payment practices;

- HM Treasury's Transforming Government Procurement, January 2007;
- HM Treasury's Infrastructure Procurement: delivering long-term value, March 2008;
- OGC Gateway Process;
- 2012 Construction Commitments;
- NAO's Modernising Construction Report, January 2001; and
- GLA Responsible Procurement policy.

CRL will adopt best practice principles which are aligned with the above policy drivers.

The key principles are:

- Focus on risk;
- Delivering value for money based on most economically advantageous offer;
- Working collaboratively and early engagement with the supply chain;
- Giving due consideration to engaging the supply chain in long-term relationships (frameworks);
- Contracts based on a sensible allocation of risk to the party best placed to manage them;
- Incentivised performance management;
- Responsible Procurement; and
- Collaboration with other clients to achieve smart purchasing and deliver savings and efficiencies.

CRL will take due account of the principles of the OGC fair payment guide including the possibility of setting up a project bank account.

The NEC Form of Contract has been selected by CRL as the preferred form of contract for the Crossrail Project. The NEC form of contract is endorsed by the OGC as complying fully with the principles of Achieving Excellence in Construction. It is also supported by the Procurement Expert Panel and the Sponsor. CRL has selected the NEC for the following reasons:

- It supports the collaborative approach that CRL intends to develop with its supply chain;
- It facilitates the introduction of appropriate incentives;
- It promotes a sharing and early identification of risk; and
- It encourages proactive contract management.

Generally, the NEC Engineering Construction Contract will be utilised for construction works with Main Options and Secondary Options selected to suit the requirements of the specific package. CRL will amend the standard version of the NEC to incorporate amendments to the conditions of contract where amendments are required for package specific reasons.



It is recognized by CRL that adequate resources are necessary for the effective project management of the NEC contract.

### 2.2.2 Achieving Excellence

Achieving Excellence was introduced by government to drive forward a step change in the value for money achieved by government clients on construction projects. Achieving Excellence set targets and developed an action plan for implementing Rethinking Construction targets. Achieving Excellence was launched as a three-year initiative and its key aspects include:

- Partnering;
- The development of long-term relationships;
- Reduction of financial and decision-making approval chains;
- Improved skills development and empowerment;
- The adoption of performance measurement indicators; and
- The use of tools for value and risk management.

Achieving Excellence in Construction procurement guidance is contained within a set of 11 guides and two high-level guides, which will be taken into account in the development of this strategy and will inform detailed processes and procedures. It builds on Government experience, supports future strategy and aligns with the OGC Gateway process.

### 2.2.3 Government Policy and OGC

#### HM Treasury Procurement

Transforming Government Procurement was published in 2007 and its purpose was to facilitate the delivery of high quality public construction, whilst delivering value for money in a sustainable way. The document goes on to describe what needs to be in place for good procurement:

- Be clear on the objectives of the procurement from the outset;
- Be aware of external factors that will impact on the procurement such as the policy environment or planning issues;
- Communicate the project objectives to potential suppliers at an early stage, to gauge the market's ability to deliver and explore a range of possible solutions;
- Consider using an output or outcome based specification, to give suppliers (who naturally know more about their business than potential buyers) more scope to provide innovative solutions to solve the underlying problem the procurement is designed to deal with, rather than deciding what the precise solution should be at the outset;

- Follow a competitive, efficient, fair and transparent procurement process and communicate to potential suppliers at the outset what that process will be;
- Be clear about affordability – the resources available to spend on the particular good or service; and
- Establish effective contract management processes and resources in good time to drive excellent supplier performance throughout the contract.

Infrastructure Procurement, published in March 2008, focuses on PFI solutions, but it does list key drivers of value for money in procurement, as follows:

- Be clear in your objectives;
- Focus on whole life costs;
- Use an outputs specification approach;
- Optimise the allocation of risks between the various parties;
- Rigorously identify, transfer and manage risks;
- Ensure there is a competitive market;
- Ensure there are sufficient skills and expertise;
- Structure the procurement process;
- Leave sufficient flexibility;
- Ensure there are sufficient incentives within the procurement structure;
- Allow for sufficient and robust competition; and
- Set an appropriate term for the contract.

#### **OGC Gateway Process**

CRL intend to supplement other review procedures developed for the Crossrail programme by repeating Gateway 0 reviews when significant events occur, whereby the Strategic Plan needs to be modified.

#### **NAO – Modernising Construction**

The NAO published a modernising construction report in January 2001 which focussed on how to improve construction performance by focussing on Government and the Contracting industry. The essence of the report was as follows:

- To disseminate best practice more widely;

- Improve capability of staff through training
- To embrace innovation; and
- To develop effective performance measures and measure performance against such measures.

### **2012 Construction Commitments**

CRL will seek to adopt the 2012 construction commitments which cover the following areas:

- Client Leadership;
- Procurement and Integration;
- Design;
- Sustainability;
- Commitment to People; and
- Health and Safety.

#### **2.2.4 Optimum Contractor Involvement (OCI)**

OCI is a principle upon which the procurement strategy is based.

OCI seeks to gain Contractor input into each package point to maximize construction input into the design and construction planning. As such, the way in which it is embraced will vary according to the specific requirements of each package. The package specific OCI will be developed in the Strategic Plan and the package specific procurement plans.

Initial thinking on the principles of OCI was developed in a paper presented to the Procurement Expert Panel on 4 March 2009. This paper is attached at Appendix D.

#### **2.2.5 Responsible Procurement**

'Responsible procurement' is broadly accepted to mean obtaining goods, works and services in ways that do not jeopardize the lifestyle of future generations. CRL has identified the key responsible procurement issues for Crossrail and has developed an approach through which appropriate processes will be developed and implemented.

##### **Background and Commitment to Responsible Procurement**

The Mayor's vision is for London to be an exemplary, sustainable, world city. The objective is to create a better quality of life for London's communities now and in the future. The Crossrail project will play a major role in helping to deliver this vision and will be aligned with the GLA Group Responsible Procurement Policy ("the GLA Group Policy"), which identifies three key principles:



- Strong and diverse economic growth;
- Social inclusivity to allow all Londoners to share in London's future success; and
- Fundamental improvements in environmental management and use of resources.

The GLA Group Policy aims to improve sustainability through procurement across the following seven themes:

- Encouraging a diverse base of suppliers;
- Promoting fair employment practices;
- Promoting workforce welfare;
- Meeting strategic labour needs and enabling training opportunities;
- Community benefits;
- Ethical sourcing practices; and
- Promoting greater environmental sustainability.

### **Implementing Responsible Procurement**

CRL will implement the GLA Group Policy as an integral part of its procurement processes and procedures. Internal guidance material is being developed that turns policy into actions appropriate to the specific characteristics of the goods, works or services in question.

Processes will include templates for pre-qualification questions, invitation to tender requirements and contractual provisions. They will be designed to promote responsible procurement throughout the supply chain and will be consistent with commitments made during the development phase.

In order to ensure that results are achieved, any responsible procurement commitments made by contractors during the procurement phase will be subject to an appropriate level of review, monitoring and enforcement.

The implementation of Responsible Procurement principles will seek to realise the aims of the Mayor, as described in the GLA Responsible Procurement Report, by considering the extent to which the tenets of responsible procurement may be embraced on a package by package basis at each stage of the procurement process.

Post contract award compliance with responsible procurement requirements will be managed by the PDP and checked by CRL.

An example of this in practise is the agreement with the RSPB to re-use excavated material from the tunnelling works at Wallasea Island to create a bird sanctuary.

## 2.3 Legal Framework

CRL's role in developing and delivering a new railway across London qualifies it as a Utility for the purposes of the procurement Regulations. The procurement procedures for contracts above the relevant financial thresholds must therefore be compliant with the Utilities Contracts Regulations 2006. The purpose of the Regulations is to open up the public procurement market and to ensure free movement of supplies, services and works. The Regulations are focused on achieving value for money.

### Procedure Options

Part 3 of the Regulations covers the use of the open, restricted and negotiated procedures. The selection procedures to be used by CRL will either be restricted or negotiated. The negotiated procedure is expected to be adopted for the major construction services and works contracts. This will allow the suppliers' proposed approach to these complex contracts to be optimised to deliver better value by providing CRL with greater flexibility than under the restricted procedure.

The Utilities Contracts Regulations do not refer to competitive dialogue, but appropriate aspects of this approach (as set out in the Public Contracts Regulations 2006) may be adopted for contracts that are awarded using the negotiated procedures.

### Qualification and Selection of Economic Operators

Part 4 of the Regulations covers the use of qualification systems and the criteria for rejection and selection of economic operators for tender lists. Industry supplier qualification schemes such as Link-up (provided by Achilles) may be used where appropriate to support an efficient pre-qualification process. However, major construction and systems contracts will be fully advertised through the OJEU Contract Notices procedures to ensure that all potential suppliers have the opportunity to bid for work packages.

### The Award of a Contract

Part 5 of the Regulations covers the criteria for the award of a contract. In accordance with the Regulations, CRL may award contracts on the basis of the following criteria:

- The lowest price offer; or
- The most economically advantageous offer from the point of view of the contracting authority.

Most Crossrail contracts, including all of the major engineering contracts, will be awarded on the basis of the most economically advantageous offer from the point of view of CRL. It should be noted that the Project Delivery Partner has the responsibility for managing the procurement of the Central Section Works including the Delivery Contracts and the Signalling Contracts but CRL will be the contracting party.



# Crossrail

## An Economic Appraisal of Crossrail : a summary





# Economic Appraisal of Crossrail

## 1 Introduction

Crossrail is proposed as a new railway in central London with links in the east and west to the Great Eastern and Great Western railways, as well as a branch to the southeast of London terminating at Abbey Wood. A hybrid bill to promote the scheme was introduced in Parliament in February 2005 and received its second reading on 19 July 2005.

Crossrail provides increased capacity for travel to central London and delivers time savings and congestion relief benefits, which are considered in a conventional transport economic appraisal. The increased capacity, in particular, delivers wider economic benefits that are not taken into account in a conventional appraisal.

This document outlines both the conventional transport economic appraisal of Crossrail and also the wider economic benefits. This document is a more concise version of “The economic appraisal of Crossrail”, which can be found on the CLRL website and which gives a fuller treatment of these issues.

## 2 The Conventional Transport Economic Appraisal

The conventional transport economic appraisal assesses travel time and journey quality benefits against the total cost of the project over a period of time. Such appraisals have long been used to value the relative attractiveness of different transport projects. The Department for Transport provides guidance on

conducting transport appraisals, which have been followed for Crossrail.

This section shows the benefits, costs and revenues of Crossrail. All values in this document are shown as present values. Present values convert future sums of money to equivalent values at ‘base year’ prices (2002 prices in this case), in a process called ‘discounting’. The rate at which monetary values are assumed to reduce over time – the discount rate – is set by HM Treasury. The benefits of Crossrail have been calculated for a period of 60 years after an assumed opening date in 2013.

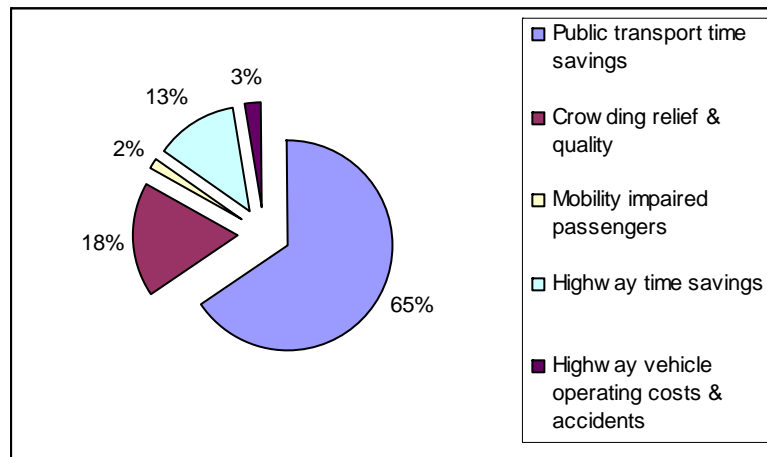
### Benefits

The transport economic benefits of Crossrail are:

- Public transport journey time savings
- Reduction in crowding and improved journey ambience/quality
- Benefits to mobility impaired passengers
- Highway journey time savings through reduced traffic congestion
- Highway vehicle operating cost savings and reduction in accidents

The breakdown of the benefits into these five categories is shown in Figure 1:

Figure 1: Transport economic benefits of Crossrail by component



In the appraisal the benefits are split between those passengers making trips in the course of business and those making leisure or commuting trips, each having a different value of time. The benefits are summarised in Table 1.

Table 1: Summary of benefits

Users	Value (£m PV)
Leisure/Commuting trips	11,229
Business trips	4,864
<b>Total</b>	<b>16,093</b>

Crossrail is forecast to deliver over £16 billion worth of transport economic benefits, with roughly one third (by value) accruing to business trips and two thirds to leisure and commuting trips.

## Costs

The capital cost used within the appraisal is consistent with the estimate of £10,292m contained in the Statement of Expense submitted with the Crossrail Bill. The £10,292m figure is the undiscounted capital cost in 2002 prices, including risk and contingency.

The scheme maintenance and operating costs shown below take account of savings to other rail operators, and so are the additional costs to the transport network as whole.

For the purposes of the economic appraisal the costs are uplifted by 21% to ensure they are in 'market prices', in accordance with DfT and HM Treasury guidance, and then discounted to give Present Values. The appraisal costs are summarised in Table 2.

Table 2: Scheme Costs

	£m PV
Capital Cost	10,626
Maintenance Costs	1,606
Operating Costs	1,670
<b>Total Costs</b>	<b>13,902</b>

A second scenario reflects a higher allowance for contingency as given in DfT guidance; this gives a capital cost of £11,539 million (Present Value) and a total cost of £14,815 million (Present Value).



## Revenue

Additional public transport revenue arises from:

- passengers switching from private cars to public transport
- changed public transport trip patterns resulting from the benefits provided by Crossrail, which make central London more attractive and accessible as a destination
- commercial opportunities on Crossrail trains and within Crossrail stations

Like the costs, the revenue has also been subject to the 'market prices' 21% uplift as required by DfT appraisal guidance.

The total additional public transport revenue in the appraisal is £6,149 million (Present Value). The total revenue to Crossrail itself is £13,575 million (Present Value), however £7,426 million (Present Value) of this is transferred from other operators and so is not additional to the public transport network.

Within the conventional appraisal, the switch of passengers from private cars to public transport results in a loss of tax revenue to the government. Money spent on tax-free public transport fares is no longer spent on other, taxable, goods. The value of this has been estimated as £1,207 million (Present Value).

## Benefit: cost ratio

The total costs of the scheme are determined from the costs provided in Table 2, less the increase in public transport revenue shown above, plus the reduction in tax revenues. The appraisal costs and benefits are summarised in Table 3.

Table 3: Scheme costs and benefits to Government

	£m PV
Total costs (from Table 2)	13,902
Less public transport revenue	-6,149
Plus tax loss	1,207
<b>Cost to Government</b>	<b>8,960</b>
<b>Total benefits (from Table 1)</b>	<b>16,093</b>
<b>Benefit : cost ratio</b>	<b>1.80:1</b>

With the higher allowance for contingency the benefit:cost ratio is 1.63:1. These benefit:cost ratios demonstrate that Crossrail has a robust traditional transport economic case.

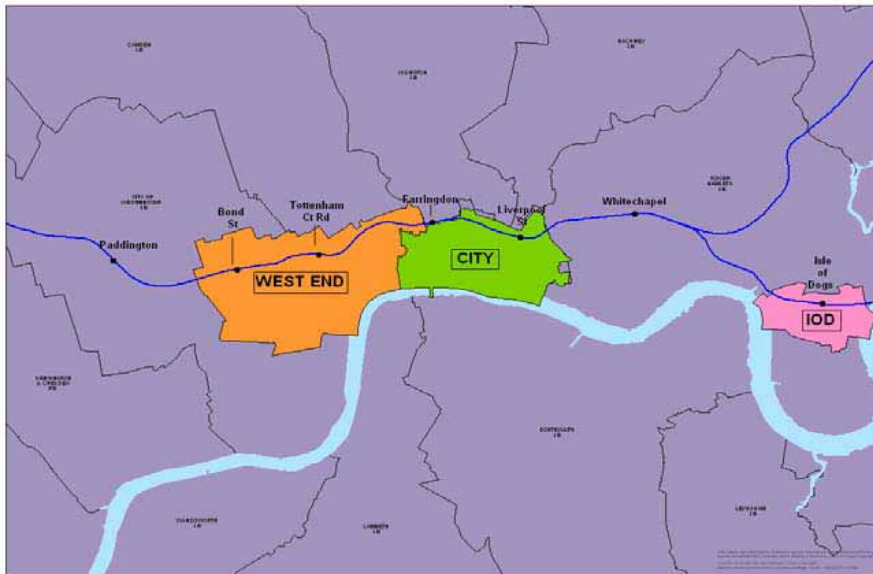
The Crossrail Review, undertaken by the DfT and published in July 2004, showed a benefit:cost ratio of 1.97:1 for a very similar scheme (with the exception of Ebbsfleet rather than Abbey Wood as the terminus of the south eastern branch). The reduction in the benefit:cost ratio to 1.80:1 is almost entirely due to the adoption of Review recommendations and changes to the DfT appraisal guidance.

## 3 Wider Economic Benefits of Crossrail

Cities exist because of the benefits of gathering economic activities together. In general, the higher the employment density, the more productive firms are. The benefits of clustering together, or agglomeration, are:

- a larger, more specialised labour market, providing employers with more choice of skills and more competition for jobs.
- more competing and complementary businesses and institutions, providing additional pressure for innovation and efficiency, and enabling greater specialization amongst support services.
- a larger, more specialised client market. London's Finance and Business Services sector for instance is a global market attracting business from around the world.
- greater potential for contact and knowledge sharing, both informally via social interaction and more formally via conferences.

The Crossrail route passes through three areas of very high employment density – the West End, the City and the Isle of Dogs.



The additional capacity and journey time savings provided by Crossrail enable employment growth in those areas, which in turn generates economic benefits because of the higher productivity there than anywhere else in London or the UK.

### Valuing Wider Economic Benefits

The DfT has issued guidance on valuing the wider economic benefits. It identifies the following benefits:

(1) **Move to more productive jobs** – this values the benefits resulting from jobs changing location into central London with its higher productivity.

Productivity in central London is estimated to be £10,000 - £12,000 per person per annum higher than productivity in outer London, in 2002 prices.

CLRL has estimated a range of employment impacts, but the 'central case' is that Crossrail will add 5,000 central area jobs by 2016 and 33,000 central area jobs by 2026.

It is assumed that workers move to these higher paid central area jobs, but their higher salaries are off-set by the additional costs of commuting into central London, and increased stress and responsibility. However there is an overall gain to the economy through higher tax revenues on the higher earnings and profits. This is estimated to be worth £3,232 million (Present Value).

(2) **Agglomeration benefits** – this values the increase in productivity to all existing central London jobs resulting from the increase in employment density arising from Crossrail.

There are no increased commuting costs to off-set the productivity gain in this case (as the benefit is to existing jobs), so the economic gains comprise the whole increase in output. This is estimated to be worth around £100 per job per annum, giving a benefit of £3,094 million (Present Value).

**(3) Increased labour force participation** – this values the increase in the overall number of people working, as a result of the time savings from Crossrail.

It is assumed that people who did not previously work will be enabled to because Crossrail reduces the (time) cost of commuting. As with (1) above, the new salaries of the additional workers are off-set by their travel costs, but there is an overall gain to the economy through the taxation on those salaries, and also in this case through the reduction in state benefit payments. This is estimated to be worth £349 million (Present Value).

**(4) Imperfect Competition** – this values the efficiency benefits to firms from reduced transport costs, where those benefits are not passed on to customers due to lack of competition.

Lower transport costs enable firms to increase output, but without competition they do not reduce prices. This benefit is not captured through conventional time savings, and is estimated to be worth £486 million (Present Value).

## Wider Economic Benefits Summary

The wider economic benefits are summarised in Table 4.

**Table 4: Summary of wider economic benefits**

	£m PV
Move to more productive jobs	3,232
Agglomeration benefits	3,094
Labour Force participation	349
Imperfect competition	486
<b>Total</b>	<b>7,161</b>

Table 4 shows that the overall value of the wider economic benefits is some £7.2 billion. This reflects Crossrail's purpose, which is specifically to alleviate congestion and increase capacity to the three main central London clusters. The wider economic benefits are entirely additional to the conventional transport economic appraisal.

## 5 Impact of Wider Economic Benefits on the economic appraisal

This section looks at the impact on the benefit:cost ratio of including the wider economic benefits. It is important to note that the guidance is new and this is the first time that such wider economic benefits have been quantified, valued and incorporated into an economic appraisal. There remain uncertainties over the valuations and how they should be incorporated into the appraisal. If the wider economic benefits were to be included just as any other benefit the impacts would be as shown in Table 5.

**Table 5: Costs and benefits including Wider Economic Benefits**

	£m PV
Total costs (from Table 2)	13,902
Less public transport revenue	-6,149
Plus tax loss	1,207
<b>Cost to Government</b>	<b>8,960</b>
Transport benefits	16,093
Wider Economic Benefits	7,161
<b>Total Benefits</b>	<b>23,254</b>
<b>Benefit : cost ratio</b>	<b>2.60:1</b>

Including the wider economic benefits in the appraisal therefore increases the benefit:cost ratio of Crossrail from 1.8 to 2.6:1. With the higher allowance for contingency within the capital costs, the benefit:cost ratio increases from 1.6 to 2.4:1. These are very significant effects and show the value of the scheme to the government and the economy as a whole.