Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Skills and Employment Strategy

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Thames Tideway Tunnel

Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Skills and Employment Strategy

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List of abbreviations

BIS Department of Business and Innovation

BML Boatmaster Licence

BTS British Tunnelling Society

CITB Construction Industry Training Board

CSCS Construction Skills Certification Scheme

CDM Construction (design and management) Regulations 2007

CSN Construction Skills Network

CSO Combined sewer overflow

FE Further Education

HE Higher Education

H&S Health and Safety

KPI Key Performance Indicator

LB London Borough

LCS Olympics Legacy Communities Scheme

MEICA Mechanical, electrical, instrumentation, controls and automation

NEET Not in Education, Employment or Training

NPS National Policy Statement

Ofwat The Water Services Regulation Authority

OLSPG GLA Olympic Legacy Supplementary Planning Guidance

ONS Office of National Statistics

RB Royal Borough

RDA Regional Development Agency

SCEM Supply Chain Engagement Manager

SEM Skills and Employment Manager

SES Skills and Employment Strategy

SME Small and Medium Sized Enterprise

STEM Science, Technology, and Mathematics

STW Sewage Treatment Works

TUCA Tunnelling and Underground Construction Academy

TTA Thames Training Alliance

TWUL Thames Water Utilities Limited

Executive summary

EX 1 Purpose

EX 1.1 This *Skills and Employment Strategy* (*SES*) has been prepared to accompany the application for development consent (the 'application') for the Thames Tideway Tunnel project.

EX 1.2 Securing the appropriate workers, skills, goods and services is fundamental to the successful delivery of the Thames Tideway Tunnel project. Beyond this, however, Thames Water aims to maximise the economic, social and environmental benefits of the considerable investment associated with this major infrastructure project. The *SES* will be a key element in helping to ensure the Thames Tideway Tunnel project delivers the social and economic components of sustainable development.

EX 1.3 The development of the *SES* was led by the Thames Tideway Tunnel project Skills and Employment working group, chaired by the Thames Tideway Tunnel Head of Asset Delivery.

EX 2 Approach

EX 2.1 The rationale and context for the *SES* was considered in detail and a comprehensive evidence base compiled (set out in Part 1 of this strategy).

EX 2.2 The evidence base allowed the key drivers of the *SES* to be identified, and on this basis high level objectives and a series of initiatives or activities were formulated for the *SES* (Part 2 of this strategy), together with a framework for delivery and monitoring.

EX 2.3 Information was gathered through desk top research and consultation with external stakeholders and various internal teams within Thames Water. Regular meetings of the Thames Tideway Tunnel Skills and Employment working group were held throughout the work. A Jobs and Skills Forum was held on 4 December 2012 to share the preliminary *SES* with external stakeholders and obtain feedback on the *SES*.

PART 1: Evidence base

EX 3 Planning policy context

EX 3.1 Planning policy and aspirations relevant to economic development, skills and employment helped to shape the development of objectives for the *SES*.

EX 3.2 The National Policy Statement for Waste Water (NPS) provides the primary policy basis for determining the application. This requires consideration of socio-economic impacts at local or regional levels during the construction and operational phases of the project. It highlights regional and local job creation and training opportunities as one of the socio-economic issues that could be considered within the assessment.

EX 3.3 The National Planning Policy Framework (NPPF), published on 27 March 2012, now replaces the majority of the Planning Policy Guidance Notes

and Statements. The NPPF does not contain specific policies for Nationally Significant Infrastructure Projects (NSIPs) for which particular considerations apply. It does advise, however, that planning authorities must take into account plans for nationally significant infrastructure in preparing their plans and that policies in an NPS will be material considerations in the determination of town and country planning applications.

EX 3.4 Unlike normal planning applications considered under the Town and Country Planning regime, the Planning Act 2008 contains no express requirements to decide an application in accordance with the policies of the local development plan.

EX 3.5 The *London Plan 2011* forms a strategic policy framework and has economic development as a cross-cutting theme. Together with the Mayor's *Economic Development Strategy for London 2010* it highlights the potential economic benefits of infrastructure projects and their essential role in London's competitiveness and innovation.

EX 3.6 Borough Local Development Frameworks (LDFs) and local economic development strategies also provide some background for the project. They contain a range of policies and aspirations relating to employment and skills, including measures to maximise economic benefits arising from the construction projects for the local workforce and economy. A review of the economic development strategies of the boroughs through which the Thames Tideway Tunnel will pass highlighted the following key themes:

a. supply the right skill set to employers
b. improve skills through training and employment
c. tackle worklessness
d. support for young people
e. increase local procurement opportunities
f. attract inward investment
g. support local business growth, innovation and enterprise.

EX 4 Demand for jobs and skills

EX 4.1 The Thames Tideway Tunnel project is a major infrastructure project that will take over six years to complete and will cost approximately £4.1billion. At its peak it is expected that there will be approximately 4,250 direct construction workers and a further 5,100 indirect jobs. There will be the greatest number of jobs at the four key tunnel drive sites at Carnwath Road Riverside (LB Hammersmith & Fulham), Kirtling Street (LB Wandsworth), Chambers Wharf (LB Southwark), and Greenwich Pumping Station (RB Greenwich).

EX 4.2 A large variety of skills will be required; in particular there will be a requirement for significant numbers of skilled construction workers and tunnelling specialists. River freight workers will also be required to implement the *Thames Tideway Tunnel Transport Strategy,* which accompanies the application. The type of companies, products and services that are likely to be most in demand include concrete, cement

and aggregate suppliers, major plant suppliers, tunnelling equipment, penstock and flap valves, marine civils, steel structures, water and power supply, marine spoil logistics, construction design and management , and skilled labour.

EX 4.3 Other major projects which are likely to occur at a similar time to the project, including Crossrail, Northern Line Extension, High Speed 2 and the National Grid upgrades in London, will increase demand for these skills. ConstructionSkills estimates that there will be an annual requirement for around 1,750 additional construction workers in London between 2012 and 2016.

EX 5 Supply-side factors

EX 5.1 The characteristics of the workforce and economy were examined in order to set the context for the *SES* and to examine the capacity for demand arising from the Thames Tideway Tunnel project to be met in the local and national economy.

EX 5.2 Deficits were identified in the supply of tunnelling and particularly river transportation skills. The supply chain is generally well developed and connected as might be expected in a city of London's size and significance. However, there are potential pinch points relating to construction design and management, barge spoil logistics, skilled marine labour and marine transport supply chain.

EX 5.3 There are issues of unemployment, low skills and economic inactivity in many of the boroughs where Thames Tideway Tunnel project worksites are located; these indicators are particularly notable in LB Newham, Tower Hamlets, Lewisham, Lambeth, Southwark, Ealing and RB Greenwich.

EX 5.4 There is generally a well-developed training infrastructure to meet general construction skills training needs, including numerous training organisations, Further Education (FE) and Higher Education (HE) Colleges and specialist training centres such as the Tunnelling and Underground Construction Academy (TUCA) and the National Construction College. Training provision for freight by water skills appears to be limited.

EX 6 Gap analysis

EX 6.1 Potential gaps relating to categories of skills, occupations and the supply chain which could have significance for delivery of the Thames Tideway Tunnel project were identified. This analysis informs the *SES* objectives and activities and also forms a framework which can be taken forward for the future assessment of the Thames Tideway Tunnel project's skills and jobs requirements.

EX 6.2 Potential skills shortages could arise in a number of occupations including boat masters, construction design and management, skilled construction, miners / underground workers, marine bargehands, steelfixers and specialist security workers.

EX 6.3 Many of the skills gaps can be addressed by short term training schemes delivered at a local level by the existing construction training infrastructure. For example steel-fixers, specialist security and many of the specialist

construction skills could be addressed by training new workers or retraining the existing construction workforce at FE colleges. Some of the gaps in tunnelling skills could potentially be addressed through short to long term training courses, eg, at TUCA. However, some of the gaps in tunnelling skills are likely to be too specialised to justify investment in training schemes given the structure of the industry and the supply of skills internationally.

EX 6.4 Longer term training would be required for other occupations such as river freight operators, and construction design and management professionals. This could potentially be provided by HE institutions. Some of the skilled construction training could require longer term training; however, it is too early to say at this point which specialist construction skills would be required and what their training needs would be.

EX 6.5 An assessment is made of the 'magnitude' or significance of the skills gap when considered against the local baseline. Boat masters are identified as a high magnitude gap, while a medium magnitude gap is apparent for construction design and management, skilled construction, and marine bargehands.

EX 7 Best practice review

EX 7.1 The best practice review, set out in Appendix A, explores lessons for developing and implementing an effective *SES*, and considers other projects and initiatives which can be used as a benchmark. Relevant lessons are:

a. a clear evidence base and rationale for the strategy is important and should be used to determine strategic objectives

b. intended beneficiaries should be identified early on with clear referral and progression routes identified

c. activities funded must be relevant to the strategic objectives

d. it is prudent to build on existing projects and partners where a track record of success exists

e. there should also be clear targets where appropriate

f. there should be a clear performance management and evaluation framework to measure performance against targets and objectives

g. based on wider experience and the achievements of RDA funded projects, activities related to skills and employment have tended to be more cost effective than activities related to Small and Medium Enterprises (SMEs).

PART 2: Skills and Employment Strategy

EX 8 Rationale and context

EX 8.1 The *SES* arises from and is shaped by a number of drivers. Most fundamentally, the successful delivery of the project depends upon securing specific skills, goods and services and implementing robust

systems to secure the health and safety of the workforce. The planning policy framework supports the consideration and optimisation of socio-economic benefits.

EX 8.2 Thames Water also aspires to move beyond legal compliance towards best practice with regard to maximising the economic benefits of the project, as reflected in its corporate sustainability objectives and the *Sustainability Statement* accompanying the application.

EX 8.3 Many of the communities through which the Thames Tideway Tunnel would pass are characterised by incidences of high unemployment, economic inactivity and deprivation; the socio-economic context therefore implies opportunities to realise considerable benefits for local communities as well as for society and the economy more widely.

EX 9 Objectives and activities

EX 9.1 Four objectives have been identified which articulate the high level goals of the *SES*, and feed directly into a series of *SES* activities - that is, initiatives and measures which Thames Water proposes to take forward to meet the objectives.

Objective 1: Achieve exemplar standards of health, safety and well-being

EX 9.2 A Zero Harm, Zero Accidents, Zero Compromise approach has been adopted for the project, signalling that the well-being of the workforce is the top priority. All workers will be equipped with the full range of skills required to successfully deliver the project while meeting the Target Zero ambition. This will require not only health and safety (H&S) and basic skills training but embedding behavioural safety within working practices and engendering a positive project culture with Thames Water as a visible client. Activities relating to this objective are:

a. develop a culture where Health and Safety is seen as the top priority
b. embed an ethos of one-to-one engagement with the workforce
c. a project-wide smart card system holding a range of data
d. contractors will be required to ensure that workers receive all H&S training necessary to fulfil their role, including project-wide and site-specific inductions, and basic skills and English where necessary.
e. ‘Project Hubs’ on the key tunnel drive sites providing space and resources to help administer initiatives to meet this objective.

Objective 2: Ensure that a suitable workforce with the right skills is available to deliver the project

EX 9.3 To successfully deliver the project in a cost effective and efficient way, a workforce with the right skills must be accessible. Thames Water will therefore support the development of relevant skills and sectors, building the capacity of the workforce and the supply chain where gaps have been identified, and working with the extensive network of providers and

stakeholders working in this field. Activities relating to this objective are as follows:

a. Thames Water will seek to ensure contractors employ at least one apprentice for every 50 site employees at all times throughout the contract

b. Thames Water will provide on-going partnership and support to TUCA and support the development of river-transport related skills, working with the Port of London Authority (PLA) and the Thames Training Alliance (TTA)

c. contractors will be required to forecast and report on their future employee requirements

d. A Skills Planning Group will be established to identify future training requirements and potential employer interventions, bringing together Thames Water, the prime contractors and supply chain, FE colleges and training organisers as well as delivery and funding agencies such as Construction Skills

e. Thames Water will work closely with Crossrail and ensure that there are strong links with the Lee Tunnel in order to carefully manage the relationship between their contracts and workforces.

Objective 3: Promote opportunities for local people and disadvantaged groups

EX 9.4 Thames Water will seek to steer its activities, and those of its contractors, to maximise benefits of jobs and contracts associated with the Thames Tideway Tunnel for local, disadvantaged and under-represented people and companies. Activities relating to this objective are as follows:

a. Thames Water will support paying the Thames Tideway Tunnel project workforce above the London Living Wage, subject to approval by Ofwat.

b. contracts will include requirements to employ local workers. At each key tunnel drive site (located in LB Hammersmith & Fulham, Wandsworth, Southwark and RB Greenwich), Thames Water will seek to ensure that at least 20% of employees live in the drive site borough, and overall, at least 25% of employees live in those boroughs where project worksites are located. For river transport, Thames Water will seek to ensure that at least 30% of employees live in Greater London, Kent or Essex.

c. Sustainable targets will be established for employment of local unemployed people and ex-offenders within the contractor workforce

d. contractors will be required to employ a Skills and Employment Manager (SEM) at each key tunnel drive site who will be responsible for job-brokerage and outreach, working to maximise the number of contractor employees drawn from the target groups and also providing expert advice on workforce training and skills

e. contractors will be required to use reasonable endeavours to maximise the diversity of their workforce. Appropriate areas within key tunnel

drive site offices should be compliant with Disability and Discrimination Act (DDA) requirements.

f. contractors will be required to use reasonable endeavours to ensure local businesses benefit from spending on goods and services during the project. Thames Water and main contractors will use the online procurement portal CompeteFor to advertise contracts. Contractors will employ a Supply Chain Manager (SCEM) who will engage with local businesses in order to maximise opportunities arising from the project.

Objective 4: Support initiatives to promote STEM education and careers

EX 9.5 Thames Water will promote Science, Technology, Engineering and Maths (STEM) education in schools, and to promote STEM careers and routes into relevant occupations. The target beneficiaries of this objective are secondary school age children and other teenagers within the key tunnel drive site boroughs. Some beneficiaries could ultimately become part of the Thames Tideway Tunnel project workforce. However the key aim is to inform and inspire young people about STEM careers more generally. Activities relating to this objective are as follows:

a. Thames Water will promote STEM subjects and work based learning in secondary schools and colleges in drive site boroughs in order to raise young peoples' interest in STEM subjects and career paths. It is planned that the project's STEM ambassador programme will be continued. Use of the 'project hubs' at the key tunnel drive sites and site visits to the project worksites could be part of this programme.

b. Thames Water will also explore opportunities to promote STEM education for teenagers who are not attending school.

c. Thames Water will explore opportunities to work with organisations who promote engineering careers. Thames Water will also facilitate the involvement of the Thames Tideway Tunnel project's industry experts with schools and colleges and institutions promoting engineering careers.

EX 10 Monitoring performance

EX 10.1 It is important that the *SES* objectives and specific activities can be effectively monitored and measured. This will allow lessons to be learnt to help guide the project both during construction and after completion.

EX 10.2 The rationale and potential methods for developing a performance measurement system are set out. This includes monitoring of outputs and outcomes to determine whether the targets and strategic objectives - such as intended changes in the local community, environment or workforce - are being achieved.

EX 10.3 The suggested outputs and outcomes are indicative at this stage; and will need to be defined in more detail in due course.

EX 11 Delivery

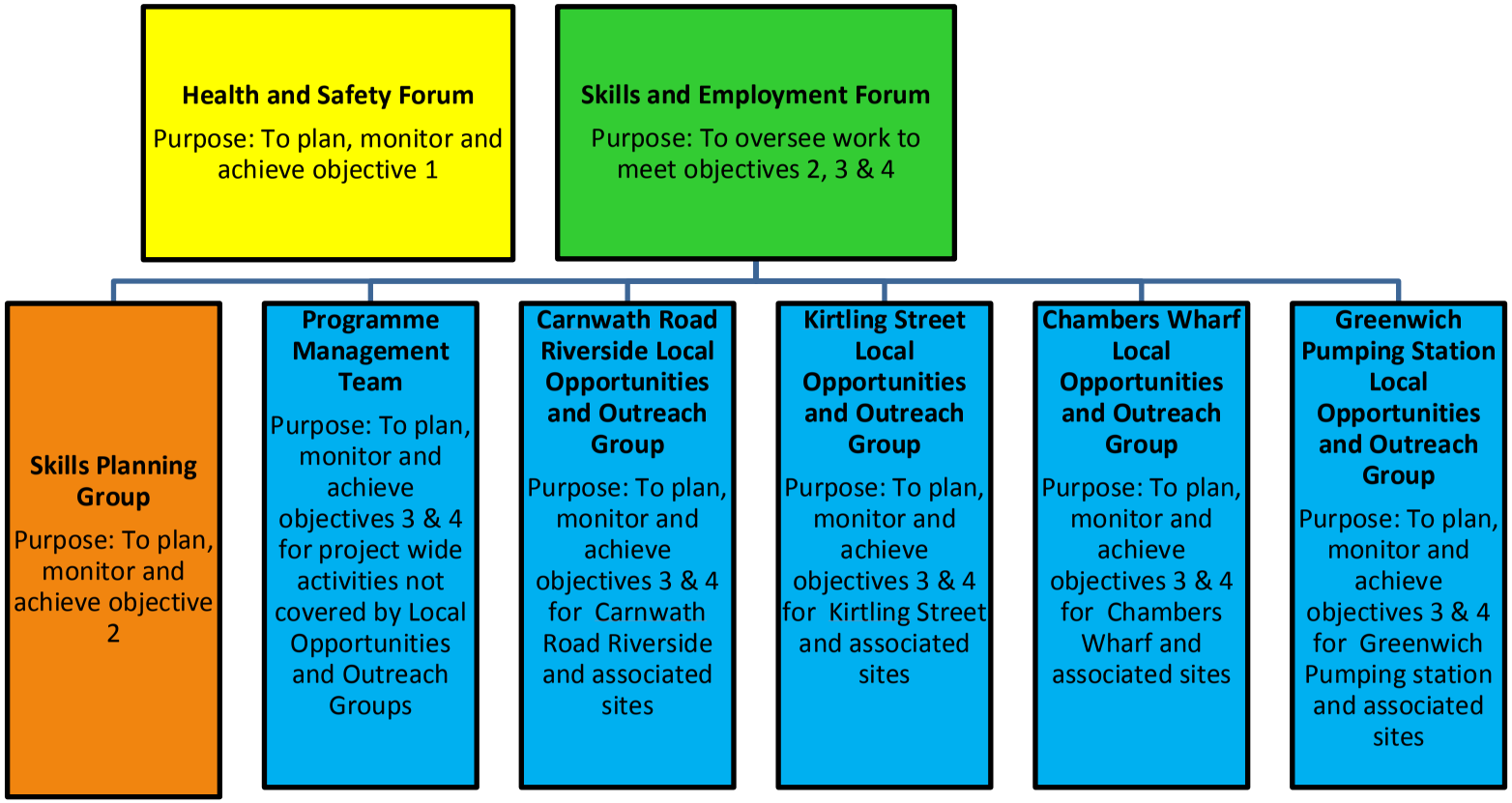
EX 11.1 Thames Water has identified an indicative organisational structure (Plate EX. 1) and a timeline for the delivery of the *SES* up to commencement of construction. For each element of the *SES*, a team with a clearly identified lead will drive forward delivery. At all levels, it is envisaged that a variety of stakeholders, including Thames Water, the Thames Tideway Tunnel project team, contractors and external parties will be involved.

EX 11.2 A Skills and Employment Forum will lead the delivery of Objectives 2, 3 and 4, and take responsibility for the overall delivery of the *SES*. A Health and Safety Forum will sit parallel to this and lead the delivery of Objective 1.

EX 11.3 A series of groups or teams will sit beneath and report to the Skills and Employment Forum. This will include a Skills Planning Group which will draw together stakeholders and experts to identify skills and training needs and deliver Objective 2; and Local Opportunity and Outreach Groups which will deliver Objectives 3 and 4 at the four key tunnel drive sites.

EX 11.4 It is recognised that professional support and other resources such as space for training at the project hubs will be required, together with a robust framework for monitoring and feedback against targets.

Plate EX. 1 Indicative governance and delivery structure for Skills and Employment Strategy



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Part 1: Introduction and evidence base

1 Introduction

1.1 Purpose of this document

1.1.1 This *Skills and Employment Strategy (SES)* has been prepared by Thames Water[i], to accompany the application for the Thames Tideway Tunnel project ('the project').

1.1.2 Securing the appropriate workers, skills, goods and services is fundamental to the successful delivery of the project. Beyond this, however, Thames Water aims to maximise the economic, social and environmental benefits of the considerable investment associated with the Thames Tideway Tunnel project, especially for local people, and to ensure that the skills and training infrastructure associated with the project form part of a legacy for future generations.

1.2 Introduction to the project

1.2.1 The project comprises a wastewater storage[ii] and transfer tunnel between Thames Water's operational sites at Acton Storm Tanks and Abbey Mills Pumping Station. It would intercept identified combined sewer overflows (CSOs) that frequently discharge into the tidal Thames. The flows of combined sewage (which is raw sewage mixed with rainwater) would be captured, stored and pumped out for treatment at Beckton Sewage Treatment Works (STW). A total of 24 sites are required in London to construct and operate the project.

1.2.2 By virtue of its location, purpose and storage capacity, the Thames Tideway Tunnel project is a nationally significant infrastructure project (NSIP), under the Planning Act 2008 (the 2008 Act).

1.2.3 In accordance with the 2008 Act, Thames Water is making an application which would contain the consents and powers necessary for the construction, operation and maintenance of the project. The project has evolved through a robust site selection process, in response to extensive consultation and engagement with stakeholders, and through on-going design development.

1.2.4 The National Policy Statement for Waste Water (designated March 2012) ('the NPS') sets out Government policy for planning decisions on NSIPs

[i] The Draft Thames Water Utilities Limited (Thames Tideway Tunnel) Development Consent Order contains an ability for TWUL to transfer powers to an Infrastructure Provider (as defined in article 2(1) of the DCO) and/or, with the consent of the Secretary of State, another body

[ii] It should be noted that wastewater would only be stored in the tunnel for a temporary period until it can be pumped out at Beckton Sewage Treatment Works

for this type of infrastructure. The NPS confirms the need for a Thames Tideway Tunnel project as the preferred solution to address the problem of unacceptable levels of untreated sewage discharge into the tidal Thames.

1.2.5 The NPS sets out the Government's key policy objectives for waste water infrastructure, which include "*sustainable development – to seek waste water infrastructure that allows us to live within environmental limits and that helps ensure a strong, healthy and just society, having regard to environmental, social and economic considerations*". The NPS states that an application should include an assessment of socio-economic impacts at local or regional levels during the construction and operational phases of the proposed development. It highlights regional and local job creation and training opportunities as one of the socio-economic issues that could be considered within the assessment (paras. 4.15.2 – 3). The *SES* will be a key element in helping to ensure the Thames Tideway Tunnel project delivers the social and economic components of sustainable development.

1.2.6 The Planning Inspectorate and the decision maker (the relevant Secretary of State[iii]) will use the NPS as the primary basis for deciding the application. The 2008 Act requires the decision maker to consider any other matters which are important and relevant to its decision.

1.3 The applicant

1.3.1 Thames Water is a statutory water and sewerage undertaker. It is the UK's largest water and wastewater services company, serving around 13 million customers across London and the South East of England.

1.4 Structure of this document

1.4.1 This document is formed of two parts: the introduction and evidence base which forms the basis for the strategy (Sections 1 to 7); and the strategy itself (Sections 8 to 11):

a. Part 1: Introduction & evidence base

   i Section 2 gives an overview of the Thames Tideway Tunnel project

   ii Section 3 describes the project approach to skills and employment and to developing the *SES*

   iii Section 4 sets out a review of the planning policy context

   iv Sections 5 and 6 assess the demand for skills and workers arising from the Thames Tideway Tunnel and other major projects, and the characteristics and capacity of the workforce and economy to meet this demand

   v Section 7 presents a gap analysis based on review of demand and supply factors, and sets out potential skills gaps which could have significance for delivery of the Thames Tideway Tunnel project

[iii] The Secretary of State will be the Secretaries of State at Defra and DCLG acting together

b. Part 2: *Skills and Employment Strategy*

i Section 8 describes sets out the rationale and context which underpins the *SES*, identifying the key drivers for the work

ii Section 9 sets out the high level objectives of the *SES* and the activities through which Thames Water proposes to achieve the *SES* objectives

iii Section 10 covers the anticipated outputs and outcomes associated with the activities and objectives

iv Section 11 describes the arrangements for *SES* delivery and governance.

1.4.2 Supplementary information is provided within Appendices A to F, including a review of best practice in the delivery of skills training and business support and in the development of strategies on skills and employment (Appendix A).

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2 The Thames Tideway Tunnel project

2.1 Overview

2.1.1 At present, untreated sewage mixed with rainwater (combined sewage) regularly overflows into the River Thames from London's Victorian sewerage system via CSOs.

2.1.2 Combined sewage discharges must be reduced in order to comply with relevant wastewater legislation. The primary objective of the proposed Thames Tideway Tunnel project (the 'project') is to control discharges from CSOs in order to meet the requirements of the European Union's Urban Waste Water Treatment Directive (91/271/EEC) (UWWTD) and the related United Kingdom (UK) Urban Waste Water Treatment Regulations. Other European Union and UK legislation also forms part of the legal framework within which the project is to be designed and delivered. The Water Framework Directive, and the regulations that transpose it into UK law, set out various 'environmental objectives' to be achieved in relation to surface water quality.

2.1.3 The project would control CSO discharges by intercepting and diverting combined sewage flows into a new storage and transfer tunnel. The tunnel would run from Acton Storm Tanks in west London to Abbey Mills Pumping Station in the east, where it would connect to the Lee Tunnel, which would transfer the flows to Beckton Sewage Treatment Works for treatment.

2.1.4 The project comprises two principal elements:

a. tunnels:
   i the main tunnel
   ii connection tunnels.
b. sites:
   i main tunnel sites
   ii CSO sites
   iii system modification sites
   iv Beckton Sewage Treatment Works.

2.1.5 The new infrastructure would protect the tidal Thames from increasing pollution for at least the next 100 years. The current assumption is that construction would commence in 2016 and be completed by 2023.

2.2 Tunnels

Main tunnel

2.2.1 The main tunnel would capture and store combined sewage from the unsatisfactory CSOs along its route and transfer it to Beckton Sewage Treatment Works.

2.2.2 The horizontal alignment of the main tunnel would generally follow the River Thames, where possible and practical, in order to:

a. ensure the most efficient route to connect the CSOs located on both banks of the river

b. enable river transport during construction to supply and remove materials, where practicable and economic

c. minimise the number of structures the tunnel would pass beneath in order to reduce the number of third parties affected.

2.2.3 The main tunnel route would take the shortest line from Acton Storm Tanks to the River Thames and stay beneath the river from west London to Rotherhithe. It would then divert from beneath the River Thames to the northeast via the Limehouse Cut and terminate at Abbey Mills Pumping Station, where it would connect to the Lee Tunnel.

2.2.4 The main tunnel would be approximately 25km long with an approximate internal diameter of 6.5m in the west increasing to 7.2m through central and east London. The approximate depth of the tunnel would be between 30m in west London and 65m in the east in order to provide sufficient clearance to existing tunnels and facilities under the city and meet the hydraulic requirements.

Connection tunnels

2.2.5 Two long connection tunnels would be required in order to connect five remote CSOs to the main tunnel. The tunnels are known as:

a. the Frogmore connection tunnel (approximately 3m internal diameter and approximately 1.1km long), which would be situated in the London Borough (LB) of Wandsworth

b. the Greenwich connection tunnel (approximately 5m internal diameter and approximately 4.6km long), which would pass through the London boroughs of Southwark and Lewisham and the Royal Borough (RB) of Greenwich.

2.2.6 A series of shorter connection tunnels would also be necessary to connect various CSOs that are close to the proposed main tunnel route.

2.3 Site types

2.3.1 The Environment Agency has identified 34 ‘unsatisfactory’ CSOs that the project needs to address. CSO control studies and design development have established that 14 of these CSOs could be controlled indirectly, which reduces the number of worksites required.

2.3.2 A detailed site selection process has been carried out, having regard to engineering, planning, environment, socio-economic, community and property constraints. Twenty-four worksites were selected in total, which can be categorised by function as follows:

a. Five ‘main tunnel sites’: These sites would be used to construct the main tunnel and can be further classified as ‘drive sites’ and/or ‘reception sites’. Shafts would be excavated to the appropriate depth

and the tunnel boring machines would start at ‘drive shafts’ and be removed via ‘reception shafts’. A shaft may serve as both a drive and a reception shaft.

b. Sixteen ‘CSO sites’: These sites would be used to construct the CSO drop shafts and interception structures and to drive or receive connection tunnels.

c. Two ‘system modification sites’: These sites would be used to control CSOs locally rather than connecting them to the main tunnel.

d. Beckton Sewage Treatment Works: This site would be used to lift the combined sewage flows from the main tunnel system and transfer them for treatment. This site also requires a siphon tunnel to bypass the pumping mechanism when the tunnel system is full.

Key tunnel drive sites

2.3.3 For the purposes of this document, the four ‘key tunnel drive sites’ are defined as:

a. Carnwath Road Riverside (LB Hammersmith and Fulham)

b. Kirtling Street (LB Wandsworth)

c. Chambers Wharf (LB Southwark)

d. Greenwich Pumping Station (RB Greenwich).

2.3.4 It is anticipated that ‘Project Hubs’ will be established at these key tunnel drive sites to provide space and resources to help administer initiatives set out in this *SES*.

2.4 Above-ground permanent works

2.4.1 Some permanent above-ground infrastructure would be required, which would vary according to the type of site. This infrastructure might include:

a. air management facilities including ventilation structures and ventilation columns

b. a kiosk structure to house electrical and control equipment

c. a means of access

d. areas of hardstanding adjacent to shafts and structures to enable periodic inspection and maintenance.

2.4.2 Maintenance visits would be required approximately every three to six months for above-ground equipment inspections and every ten years for tunnel system and shaft inspections.

2.4.3 Construction sites would be restored on completion of the works by means of levelling, in-filling, landscaping and making good.

2.5 The application documents

2.5.1 This document presents the skills and employment strategy for the project and takes account of the planning and regulatory drivers which have

influenced the development of the project. It is part of a suite of documents which accompany the application. It draws upon, and complements, scheme information including the findings presented in the *Environmental Statement*, notably those contained in the socio-economics assessment, and other technical studies such as the *Equalities Impacts Assessment (EqIA),* and *Sustainability Statement,* which accompany the application, to examine how the project would affect the local and regional economy, local communities and businesses.

2.5.2 A full description of all the application documents is provided in the *Guide to the Application* which accompanies the application. Plate 2.5.1 below provides a visual representation of the application documents.

Plate 2.5.1 Documents accompanying the application for development consent

1. Application Form	1.1 Covering Letter	1.2 Application Form	1.3 Newspaper Notices	1.4 Guide to the Application	1.5 PINS Application Checklist			
2. Plans/Drawings/Sections	2.1-2.29 Book of Plans							
3. Draft Development Consent Order	3.1 Draft Thames Water Utilities Limited (Thames Tideway Tunnel) Development Consent Order		3.2 Explanatory Memorandum					
4. Compulsory Acquisition Information	4.1 Statement of Reasons		4.2 Funding Statement		4.3 Book of Reference			
5. Reports/Statements	5.1 Consultation Report		5.2 Statement in Respect of Statutory Nuisance		5.3 Heritage Statement			
6. Environmental Impact Assessment and Habitats Regulations Information	6.1 Environmental Statement Non-Technical Summary		6.2 Environmental Statement		6.3 Habitats Regulations Assessment: No Significant Effects Report			
7. Other Documents	7.1 Planning Statement	7.2 Draft Statements of Common Ground	7.3 Section 106 Obligations: Heads of Terms	7.4 Design and Access Statement	7.5 Final Report on Site Selection Process	7.6 Open Space Assessment	7.7 Sustainability Statement	7.8 Energy and Carbon Footprint Report
	7.9 Transport Strategy	7.10 Transport Assessment	7.11 Draft Project Framework Travel Plan	7.12 Health Impact Assessment	7.13 Overarching Archaeological Written Scheme of Investigation	7.14 Air Management Plan	7.15 Skills and Employment Strategy	7.16 Equalities Impact Assessment
	7.17 Design Principles	7.18 Engineering Design Statement	7.19 Code of Construction Practice, Part A and Part B	7.20 Navigational Issues and Preliminary Risk Assessment	7.21 Settlement Information Paper	7.22 Utilities Statement	7.23 Resilience to Change	7.24 Daylight/Sunlight Assessment
8. Background Reports	8.1 Thames Tideway Strategic Study (2005)		8.2 Tackling London's Sewer Overflows (2006)		8.3 Needs Report (2010)			

Note:

The categories of application documents shown reflect those suggested in Appendix 1 to The Planning Inspectorate's Advice Note six: Preparation and submission of application documents.

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3 Project approach to skills and employment

3.1 Framework for developing the Skills and Employment Strategy

3.1.1 The development of the *SES* was led by the Thames Tideway Tunnel Skills and Employment working group, chaired by the Thames Tideway Tunnel Head of Asset Delivery. The Skills and Employment working group is made of members drawn from a range of departments within Thames Water, including environment and planning, procurement, delivery, organisational development and finance. This diverse membership reflects that the *SES* is relevant to many elements of the Thames Tideway Tunnel and cuts across a number of workstreams.

3.1.2 Consultation with external stakeholders was designed into the strategic process, reflecting the wide-ranging expertise and local knowledge which exists within the field of skills and employment, and the fundamental importance of partnership with key stakeholders for delivery of the Thames Tideway Tunnel project *SES*.

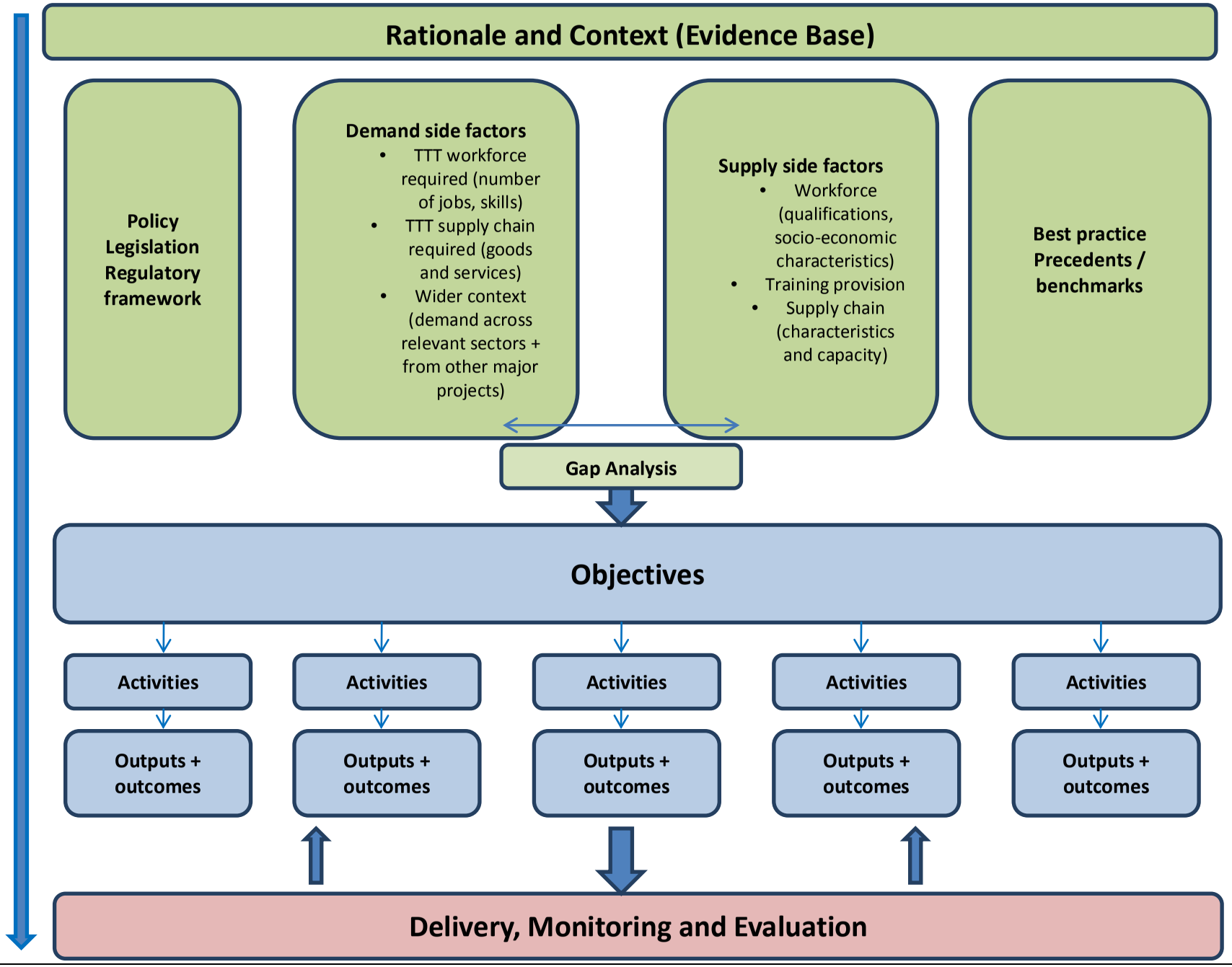
3.1.3 The approach to the *SES* is set out below in Plate 3.1.1.

3.1.4 Reflecting best practice in strategic development, the rationale and context for the strategy was considered in detail and a comprehensive evidence base compiled. This evidence base is set out in Part 1 of this strategy, and also includes the best practice review set out in Appendix A.

3.1.5 Having considered the evidence base and identified the key drivers of the *SES*, the high level objectives were agreed, and a series of initiatives or activities proposed.

3.1.6 The *SES* includes identification of the expected outputs and outcomes associated with the activities and objectives and a framework for monitoring and evaluation. Arrangements for delivery and governance, including the identification of individuals and groups responsible for leading and implementing the activities, also form an important part of the *SES*.

Plate 3.1.1 Skills and employment strategy strategic framework



3.2 Method

3.2.1 The compilation of the evidence base involved desk top research and consultation with a range of external stakeholders (see Appendix B) and various internal project teams.

3.2.2 Information was gathered on the planning policy, legislative and regulatory context. A comprehensive best practice review was undertaken, covering existing initiatives for the delivery of skills, training and business support; skills and employment interventions associated with other development projects; and writing and delivering an effective *SES*. The best practice review is presented in Appendix A.

3.2.3 The baseline work also analysed the demand for jobs and skills arising from the Thames Tideway Tunnel and other projects, the characteristics of the relevant industrial sectors and workforce, and the current landscape for the delivery of skills, education and employment services in London and the UK.

3.2.4 The *SES* was developed on the basis of the evidence by the Thames Tideway Tunnel Skills and Employment working group which met regularly between September 2012 and December 2012. Jobs and Skills Forum meetings were held with external stakeholders on 24 May 2012 and again on 4 December 2012 at which the preliminary *SES* was shared and discussed with external stakeholders; the feedback from which was incorporated into the final *SES*.

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4 Policy context

4.1 Aims and scope

4.1.1 This section sets out the planning policy framework for the Thames Tideway Tunnel project. It highlights the policies and aspirations relevant to economic development, skills and employment, and therefore to the development of objectives for the *SES*.

4.2 National policy

National Policy Statement for Waste Water

4.2.1 Section 104(2) of the Planning Act, 2008 Act states that in deciding an application the decision maker must have regard to:

a. any relevant National Policy Statement, which in this case is the NPS for Waste Water

b. any local impact report

c. any matters prescribed in relation to development of the description to which the application relates (there are none in this case)

d. any other matter which the decision maker thinks is both important and relevant to its decision.

4.2.2 Section 104(3) further states that applications must be decided in accordance with any relevant NPS, except to the extent that to do so would:

a. lead to the UK being in breach of its international obligations

b. be in breach of any statutory duty that applies to the decision maker

c. be unlawful

d. result in adverse impacts from the development outweighing the benefits

e. be contrary to regulations about how its decisions are to be taken

4.2.3 The NPS for Waste Water, therefore, has a particularly important status in the decision to be made on this application.

4.2.4 Whilst, the decision maker will also have regard to "*any other matter which* [it] *thinks is both important and relevant",* the potential relevance of planning policy set out in other local, regional or national policy documents is reduced by the following:

a. the NPS itself advises at para. 1.1.6 that it has already taken account of relevant Planning Policy Statements and Planning Policy Guidance notes (which were in any event cancelled on the publication of the National Planning Policy Framework (the NPPF), apart from PPS 10 dealing with Waste)

b. the NPPF itself confirms at para. 3 that it does not set policy for NSIPs and that relevant policy is to be found within the NPSs

c. unlike normal planning applications considered under the Town and Country Planning regime, the Planning Act 2008 contains no express requirement for the decision maker to have regard to the terms or policies of the local development plan

d. the NPS advises at para. 1.1.6 that, in the event of a conflict between the NPS and any other document, the NPS prevails for the purposes of decision making.

4.2.5 The NPS makes clear that, given the level and urgency of need for waste water infrastructure, the decision maker should start with a presumption in favour of granting consent to applications for waste water NSIPs unless any more specific and relevant policies set out in the NPS clearly indicate that consent should be refused (para. 3.1.2).

4.2.6 The paras. below set out details of the relevant policy and tests provided by the NPS.

Factors for examination and determination of applications

4.2.7 Part 3 of the NPS considers a number of general policies which are relevant to decision making on waste water NSIPs. In considering any proposed development, and in particular when weighing its adverse impacts against its benefits, the decision maker should take into account (para. 3.1.3):

a. its potential benefits including its contribution to meeting the need for waste water infrastructure, job creation and any long-term or wider benefits; and

b. its potential adverse impacts, including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.

4.2.8 In this context, the decision maker should take into account environmental, social and economic benefits and adverse impacts which are identified at national, regional and local levels (including in local impact reports).

4.2.9 Part 4 of the NPS sets out policies which are relevant to particular physical impacts of the construction and operation of waste water NSIPs, under a heading of *Generic Impacts*. The NPS also provides guidance on what should be included in the applicant's assessment, the principal considerations for decision making and an outline of possible mitigation measures. The approach advised in relation to socio-economics is outlined below.

Socio-economic

4.2.10 Where a project is likely to have socio-economic impacts at a local or regional level, applicants should undertake an assessment of these impacts during the construction, operation and decommissioning stages of the development (para. 4.15.2). Potential socio-economic impacts include the creation of jobs and training opportunities (addressed in this document), impacts on rights of way and effects arising from an influx of

workers during the construction phase (para. 4.15.3). Impacts on tourism or local business can also be relevant (para. 4.15.5).

4.2.11 The applicant should describe the existing demographics of the area surrounding the development and could also refer to how the development's socio-economic effects correlate with local planning policy (para. 4.15.4).

4.2.12 The applicant should assess whether a disproportionate number of a particular equalities group will be affected by the generic impacts e.g. air emissions, other emissions, flood risk, noise, visual impacts, land use etc. This will require an Initial Equalities Impact Assessment (EqIA) to identify potential adverse, differential or positive impact on equalities groups, and whether these are direct or indirect. If significant impacts are identified at the screening stage, a full Equalities Impact Assessment should be undertaken. The applicant should describe the equalities impact on people living, working or owning businesses who may be displaced as a result of the development, as well the indirect equalities impact of a loss of goods or services as a result of displacement (para. 4.15.6).

4.2.13 The decision maker is required to have regard to the applicant's assessment of socio-economic effects and to other sources that it considers important and relevant. However, the NPS advises that it "*should be reasonable for the decision maker to conclude that little weight is to be given to speculative assertions of socio-economic impacts not supported by evidence (particularly in view of the need for wastewater infrastructure as set out in this NPS*)" (para. 4.15.10).

National Planning Policy Framework

4.2.14 Section 104 (2) of the 2008 Act indicates that the decision maker must have regard to any NPS that has effect and to any other matters which it thinks are both important and relevant to its decision. This may require some consideration of the National Planning Policy Framework (NPPF), published on 27 March 2012. The NPPF now replaces the majority of the Planning Policy Guidance Notes and Statements, with the exception of a small number of documents including PPS 10: *Planning for Sustainable Waste* (2011).

4.2.15 The NPPF does not contain specific policies for NSIPs for which particular considerations apply. Para. 3 states:

"*These are determined in accordance with the decision-making framework set out in the Planning Act 2008 and relevant national policy statements for major infrastructure, as well as any other matters that are considered both important and relevant (which may include the National Planning Policy Framework). National policy statements form part of the overall framework of national planning policy, and are a material consideration in decisions on planning applications*".

4.2.16 In preparing local plans para. 162 of the NPPF states that *"authorities should work with other authorities and providers to assess the quality and capacity of infrastructure for transport, water supply, wastewater and its*

treatment", and to *"take account of the need for strategic infrastructure including nationally significant infrastructure within their areas".*

4.2.17 In other words, the NPPF does not set policies or tests for a Waste Water NSIP. It does advise, however, that planning authorities must take into account plans for nationally significant infrastructure in preparing their plans and that policies in an NPS will be material considerations in the determination of town and country planning applications.

4.3 Regional context

The London Plan 2011

4.3.1 There is no requirement to have regard to the *London Plan 2011* in determining the application. The *London Plan 2011* was published in July 2011[1] and outlines the spatial development strategy for Greater London until 2031. Economic development is one of the cross-cutting themes of the *London Plan 2011*. The Mayor's vision and objectives for development up to 2031 aim to ensure that *"London excels among global cities – expanding opportunities for all its people and enterprises, achieving the highest environmental standards and quality of life and leading the world in its approach to tackling the urban challenges of the 21st century".*

4.3.2 This overarching vision is supported by several objectives, which seek to ensure London is:

a. "A city that meets the challenges of economic and population growth";

b. "An internationally competitive and successful city";

c. "A city that becomes a world leader in improving the environment"; and

d. *"A city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities*".

4.3.3 Policy 1.1 'Delivering the strategic vision and objectives for London' outlines the Mayor's vision for economic growth, remaining competitive and ensuring that everyone has access to jobs and opportunities. As there are concentrations of deprivation within certain London boroughs (eg, Tower Hamlets, Newham and Southwark) geographically targeted investment and approaches to development and regeneration are required.

4.3.4 Policy 2.14 'Areas for Regeneration' states that the Mayor will work with strategic and local partners to stimulate regeneration by way of coordinated neighbourhood investment. Boroughs should outline policies which encourage regeneration and development, including "improvements in learning and skills" and employment.

4.3.5 Policy 4.1 'Developing London's economy' outlines the Mayor's targets for promoting "the continued development of a strong, sustainable and increasingly diverse economy" including "supporting infrastructure and suitable environments for larger employers and small and medium sized enterprises". Specialist economic activity, enterprise and innovation should also be encouraged, and concentrations of deprivation targeted.

4.3.6 Policy 4.10 'New and Emerging Economic Sectors' supports innovation and research, aiming to "promote clusters of research and innovation as focal points for research and collaboration between businesses, Higher Education Institutions (and) other relevant research and innovation agencies and industry" ensuring that businesses with bespoke requirements are accommodated.

4.3.7 Policy 4.12 'Improving Opportunities for All' seeks to improve "employment opportunities for Londoners, to remove barriers to employment and progression and to tackle low participation in the labour market". This will be achieved by supporting local employment, development and training to address "the mismatch between labour supply and demand in terms of education (and) skills".

4.3.8 Policy 5.14 'Water Quality and Wastewater Infrastructure' provides clear and strong support for the Thames Tideway Tunnel project, stating that the "development of the Thames Tideway Tunnels to address London's CSOs should be supported in principle", and that relevant boroughs should in principle "support the Thames Tideway Sewer Tunnels".

The Mayor's Economic Development Strategy for London

4.3.9 The *Mayor's Economic Development Strategy for London* was published in May 2010[2]. It outlines several objectives to support the development of London's economy and the skills of London residents:

a. "to promote London as the world capital for business

b. "to ensure that London has the most competitive business environment in the world"

c. "to give all Londoners the opportunity to take part in London's economic success, access sustainable employment and progress in their careers"

d. "to attract the investment in infrastructure and regeneration which London needs, to maximise the benefits from this investment".

4.3.10 Para. 4.7 of the Strategy states that investment in London's infrastructure will generate a substantial number of jobs. Over the period to 2031 "it is estimated that Crossrail, Olympics, Thames Tideway and major developments at Brent Cross, Kings Cross, and Stratford will generate at least 130,000 jobs".

4.3.11 Para. 4.26-4.28 emphasise the importance of education in order to give young people opportunities in the London economy, to align educational attainment with the needs of London's labour market, and to assist 16 to 18 year olds not in education, employment or training. Para. 4.35 notes that "there must be resources to support an increasing number of apprenticeships in London and employers need to be encouraged to create more apprenticeship places".

4.3.12 Action 4A outlines the Mayor's commitment to maximising "*the number, variety and quality of jobs needed to provide work opportunities for Londoners and to meet the needs of London's growing and developing economy*". Actions 4D and 4E outline the Mayor's commitment to help

people secure and retain jobs, working with partners *"to significantly improve training and employability support, with a particular focus on neighbourhoods with high concentrations of worklessness"* and to help Londoners "acquire relevant skills and qualifications to progress in their careers".

4.3.13 Para. 5.21 outlines significant investments being made to London's infrastructure, which includes "the building of the £2.5 billion Thames Tideway sewer". Para. 5.25 supports sustained investment in infrastructure as essential to London's competitiveness and innovation.

Skills and Employment Strategy for London

4.3.14 The London Skills and Employment Board's '*From Recession to Recovery: Skills and Employment Strategy for London 2009-2014*' was published in 2009[3]. It aims to tackle the impact of recession and to keep London's economy competitive to provide more skills and job opportunities to Londoners. It outlines the following aims (p. 7):

a. *"Strategic aim 1 – Working with employers to support them in developing their businesses and keeping London's economy competitive to provide more job and skills opportunities to Londoners"*

b. *"Strategic aim 2 – Supporting Londoners to improve their skills, job and advancement prospects through integrated employment support and training opportunities"*

c. *"Strategic aim 3 - Creating a fully integrated, customer-focused skills and employment system".*

4.3.15 The London Skills and Employment Board stopped activity in April 2011 and some of its functions were folded into the London Enterprise Panel, which was established as the Local Enterprise Partnership in February 2012. A Skills and Employment Working Group has been set up to make recommendations to the Panel related to employment and skills. The London Enterprise Panel is currently working on a new Employment and Skills Plan.

4.4 Local planning policy and strategy

4.4.1 The application will be judged by the decision maker primarily on the policies in the NPS. The Planning Inspectorate must also have regard to any local impact report prepared by affected local planning authorities.

4.4.2 The local planning policies for the boroughs which the Thames Tideway Tunnel passes though are outlined in LDFs, and provide useful contextual information which is relevant to the *SES*. Those policies relating to employment, skills and economic development are set out in Appendix C.

4.4.3 There are other borough level strategies and policy documents which identify objectives and aspirations relating to employment and skills. These have been reviewed and the following common themes have been identified as most relevant to Thames Tideway Tunnel project, with examples of relevant policies grouped under each theme as appropriate.

Theme 1: Supply the right skill set to employers

4.4.4 Borough-level policy promotes training and employment which fills skills gaps and responds to the needs of employers, thereby improving the skills and employability of residents:

a. the LB of Hammersmith and Fulham '*Economic Development Strategy*' (2007) outlines priorities in relation to employment and skills. Priority 5 is to "stimulate the supply of suitably skilled local labour to meet the needs of growing sectors (and) improved routes to employment". Partnerships with vocational training centres linked to key local industries are emphasised.

b. in the LB of Tower Hamlets '*Draft Employment Strategy'* (2011), Objective 5.4 focuses on the skills requirements of employers and aims to ensure that "a full and accurate picture of businesses' demand for skills is maintained and the advantages for people in Tower Hamlets are maximised" (p. 60).

c. the LB of Ealing '*Work and Skills Strategy 2010-2012'* Objective 2 aims to ensure "jobseekers have the right skills to meet employer needs" by offering residents vocational training to develop skills for existing and growing employment sectors and ensuring they have appropriate skills and qualifications to secure work (p.8).

4.4.5 Borough-level policies also identify the specific need for construction and engineering skills:

a. the LB of Newham '*Economic Development Strategy 2010-2027*' (2010) outlines the development of the Tunnelling Academy by Crossrail as "a key mechanism to ensure that construction workers are able to retrain and continue to secure employment" (p. 56).

b. the LB of Tower Hamlets '*Draft Employment Strategy*' (2011) lists construction and engineering as a key sector where skills will be needed in the future (p. 38), with over 20% growth in the borough construction and engineering sector since 2001 (p. 36).

c. the LB of Hammersmith and Fulham '*Economic Development Strategy*' (2007) outlines the need to "improve access to a range of employment opportunities, including construction" (para. 4.1.2).

d. the LB of Lambeth '*Economic Development Strategy 2006-2010*' (2007) supports the introduction of vocational educational opportunities in schools for employment sectors such as construction (p. 28).

e. the City of Westminster '*Economic Development Strategy 2008-2011*' supports: vocational training for key sectors in Westminster, including construction; a construction training centre at Paddington Green; and construction training and employment opportunities via Building London Creating Futures (p. 27).

Theme 2: Improve skills through training and employment

4.4.6 A common theme within borough-level policy relates to the promotion of training before and during employment to improve Londoners' skills.

a. the LB of Southwark '*Economic Development Strategy 2010-2016*' (2010) notes a "strong correlation between having low skills and being unemployed" and aims to identify skills gaps and "promote vocational routes to employment and supported placement schemes such as modern apprenticeships and work placements".

b. the LB of Lewisham '*Regeneration Strategy 2008-2020*' (2007) emphasises the importance of training and skills development in the borough, and is currently supporting adult "basic skills learners" and assisting "people on incapacity benefit and lone parents to develop skills and confidence to re-enter the labour market" (p. 22).

c. the LB of Ealing '*Work and Skills Strategy*' (2010) aims to increase "local training and employment opportunities" and outlines ways to achieve this, including partnering with employers and job brokerage services to create local training opportunities (p. 8).

d. in the LB of Hounslow's '*Employment Development Plan*' (2008) Policy E3 'Local Employment Opportunities' aims to work with partners to enhance local employment opportunities for residents.

Theme 3: Tackling worklessness

4.4.7 Worklessness is a common theme in borough-level policy. Long term unemployment can result in deteriorating skills and other barriers to work.

a. the LB of Newham '*Economic Development Strategy 2010-2027*' (2010) outlines key priorities including 'More People into Work'. It aims to maximise employability, extend the reach of employability support (for example Jobcentre Plus) and target the economically inactive (p. 57), as well as to provide pathways to employment designed to tackle worklessness, and work with partners to create employment opportunities for residents (p. 29).

b. the LB of Tower Hamlets '*Draft Employment Strategy*' (2011) outlines strategic objectives, including to "engage those workless residents detached from the labour market" and to develop interventions for tackling worklessness with key partners (p. 64).

c. the LB of Lambeth '*Economic Development Strategy* 2006-2010' (2007) Strategic Objective SO2 'Tackling worklessness and improving skills' aims to generate opportunities to reduce the impact of worklessness (p. 11).

Theme 4: Support for young people

4.4.8 Ensuring young people have access to education and training opportunities is a key theme in borough-level policy, including:

a. the LB of Newham '*Economic Development Strategy 2010-2027*' (2010) identifies "preparing young people for the future" as a key priority (p. 7) and aims to "ensure that the educational infrastructure and pathways are in place to provide young people with the knowledge and skills" to access employment opportunities (p. 29).

b. the LB of Tower Hamlets '*Draft Employment Strategy'* (2011) identifies the need to encourage the employment aspirations of young people and in order to achieve this *"*linking education services with local employers*"* may also be beneficial (p.56).

c. the LB of Lewisham *'Regeneration Strategy 2008-2020'* (2007) identifies the borough's second strategic priority as *"*young people's achievement and involvement: raising educational attainment and improving facilities for young people through partnership working*"* with relevant organisations.

Theme 5: Increase local procurement opportunities

4.4.9 Borough-level strategic documents outline the importance of supporting economic development via local procurement opportunities, as follows:

a. the LB of Tower Hamlets '*Draft Enterprise Strategy*' (2011) outlines strategic objectives to support enterprise, including SO3 'Spreading the benefits of growth: developing a partnership with and between big businesses'.

b. the City of Westminster '*Economic Development Strategy 2008-2011*' outlines the development of procurement and supply chain initiatives that support the delivery of the enterprise objectives of One City, Westminster's strategic vision.

c. a number of councils have local labour and procurement codes or strategies which aim to provide additional social benefits for local residents and local businesses through planning agreements or voluntary schemes.

Theme 6: Attract inward investment

4.4.10 An emphasis on investment to assist economic stability and regeneration is reflected in borough-level policy:

a. the LB of Hammersmith and Fulham '*Economic Development Strategy*' (2007) outlines priorities *"*which are imperative to delivering positive economic improvements*"*, to encourage inward investment (p.4) and work with private sector partners (p.57).

b. the LB of Lambeth '*Economic Development Strategy 2006-2010*' (2007) Strategic Objective SO1 aims to create the conditions for inward investment and regeneration. A key aim is *"*for private investment to be attracted to the borough to the extent necessary to achieve the development of sustainable communities*"* (p.10).

c. the LB of Tower Hamlets '*Draft Enterprise Strategy*' (2011) Strategic Objective SO1 outlines the requirement to promote the borough *"*as a location for inward investment*"* (p.46).

Theme 7: Support local business growth, innovation and enterprise

a. the LB of Southwark 'Economic Development Strategy 2010-2016' (2010) aims to create "a strong sustainable economy, with a thriving network of town centres, built on an entrepreneurial culture" (p.4).

b. the LB of Lambeth 'Economic Development Strategy 2006-2010' (2007) Strategic Objective SO3 'Supporting Enterprise' aims to create an enterprise culture, by co-ordinating business support, promoting innovation.

c. the LB of Tower Hamlets 'Draft Enterprise Strategy' (2011) includes Strategic Objectives SO2 'New business: supporting enterprise start-ups and growth'; SO4 'A changing economy: potential growth sectors'; SO5 'A pioneering borough: fostering an entrepreneurial and innovation culture'; and SO6 'A 'place' for business: ensuring Tower Hamlets has the right spaces and places to support a diverse, thriving economy' (p.45).

4.5 Summary

4.5.1 The Thames Tideway Tunnel is a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 (the 2008 Act). The NPS provides the basis for determining the application. The NPS requires the assessment of socio-economic impacts at local or regional levels during the construction and operational phases of the project. It highlights regional and local job creation as one of the socio-economic issues that could be considered within the assessment.

4.5.2 Although not of direct relevance, the *London Plan 2011* forms a strategic policy framework and has economic development as a cross-cutting theme. Together with the *Mayor's Economic Development Strategy for London 2010* it highlights the potential economic benefits of infrastructure projects and their essential role in London's competitiveness and innovation.

4.5.3 Borough Local Development Frameworks (LDFs) and local economic development strategies also inform the context for the project. They contain policies and aspirations relating to employment and skills, including measures to maximise economic benefits arising from the construction projects for the local workforce and economy.

5 Jobs and skills demand analysis

5.1 Aims

5.1.1 This section assesses demand generated by the project for workers, skills, supply chain and training provision. An assessment of the cumulative demand generated by other major construction projects such as Crossrail, Olympics Legacy, High Speed 2 and the Northern Line Extension is also made. In order to assess this potential demand the section also sets the context by describing the key features of the project and relevant job sectors.

5.2 Demand arising from the Thames Tideway Tunnel project

5.2.1 The construction of the project is a major undertaking which will last several years and involve significant resources. This includes a large amount of manpower and specialist skills. It will involve employment of numerous professions.

5.2.2 As the majority of the infrastructure will be underground tunnels carrying waste water to a treatment centre there will be limited operational jobs. However there will be some maintenance employment to ensure the project functions properly. No estimate of the number of permanent operational jobs has been made at this stage, it is assumed to be minimal.

5.2.3 The expected construction programme is shown below. This is based on the best available estimates of the Thames Tideway Tunnel delivery team.

a. advance works – approximately 2015

b. peak construction year – 2019

c. project completion – approximately 2022

d. commissioning - 2023

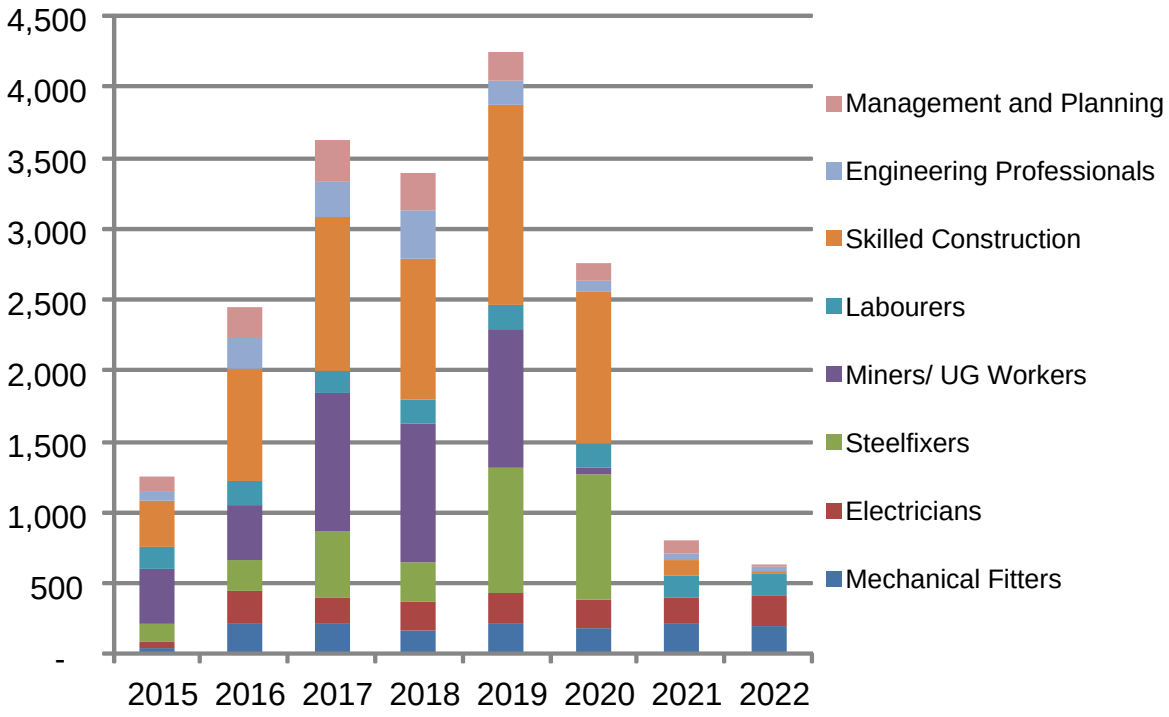
5.2.4 The current assumption on total expected project cost is approximately £4.1billion. This cost is based on the best available estimate of the Thames Tideway Tunnel delivery team.

5.2.5 Ensuring health and safety (H&S) for workers will be enshrined in all possible elements of the project.

Jobs

5.2.6 The expected number and types of jobs are shown in Plate 5.2.1 and Table 5.2.1 Thames Tideway Tunnel estimated jobs by occupation below. The peak jobs figure is estimated to be approximately 4,250. The jobs shown represent one job for one year. The job estimates are made by the project delivery team.

Plate 5.2.1 Thames Tideway Tunnel estimated construction programme



Source: Why Does London Need the Thames Tideway Tunnel? Thames Water (2012)

Table 5.2.1 Thames Tideway Tunnel estimated jobs by occupation

Occupation	Year								Total	
	2015	2016	2017	2018	2019	2020	2021	2022	Man years	%
Mechanical Fitters	50	221	218	170	213	193	216	206	**1,487**	7.8
Electricians	50	221	181	204	213	193	184	206	**1,452**	7.6
Steelfixers	113	221	471	272	892	880	0	0	**2,849**	14.9
Miners/ UG Workers	388	392	979	986	978	55	0	0	**3,778**	19.7
Labourers	163	172	145	170	170	165	160	156	**1,301**	6.8
Skilled Construction	325	784	1,088	986	1,402	1,073	104	25	**5,787**	30.2
Engineering Professionals	50	221	254	340	170	83	56	19	**1,193**	6.2
Management and Planning	113	221	290	272	212	110	80	13	**1,311**	6.8
Total	**1,252**	**2,453**	**3,626**	**3,400**	**4,250**	**2,752**	**800**	**625**	**19,158**	**100**

Source: URS extrapolation of 'Why Does London Need the Thames Tideway Tunnel: Thames Water (2012)'

5.2.7 The number and types of project worksites in each borough shown in Table 5.2.2 Thames Tideway Tunnel estimated project worksites by location. LB Wandsworth has the highest number of project sites.

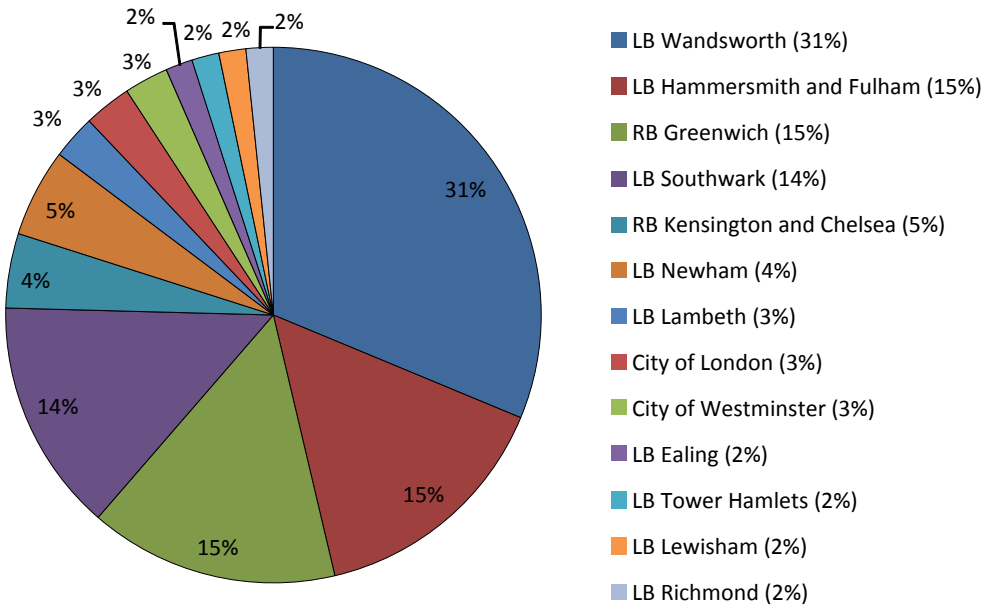
Table 5.2.2 Thames Tideway Tunnel estimated project worksites by location

Borough/Region	No. of project Sites	Main site	Other tunnel	CSO*
Ealing	1			1
Hammersmith and Fulham	2	1		1
Wandsworth	6	1	1	4
Richmond upon Thames	1			1
Lambeth	1			1
Westminster	1			1
Kensington and Chelsea	2			2
City of London	1			1
Tower Hamlets	2			2
Southwark	2	1		1
Lewisham	2			2
Greenwich	1	1		
Newham	2		1	1
Total	**24**	**4**	**2**	**18**

*Source: Thames Tideway Tunnel delivery team (2012) * Combined Sewer Overflow*

5.2.8 A broad estimate of the distribution of jobs is made. This is shown at Plate 5.2.2.

Plate 5.2.2 Demand arising from the Thames Tideway Tunnel project – estimated jobs by borough



Source: Thames Tideway Tunnel delivery team (2012)

Skills and occupation requirements

5.2.9 This section considers the skills required to deliver the project, focusing particularly on the key sectors such as specialist construction, tunnelling and marine skills. The estimated skills required to construct the project are shown in Table 5.2.1 above. The skills relate to the occupations or trades it is estimated will be required in each year throughout the course of the project. For example, at the peak construction year of 2019 approximately 892 steel-fixers will be required and 213 electricians.

5.2.10 The working assumption is that the majority of skilled construction labour would be the equivalent of NVQ2 level[iv].

5.2.11 The categories for skilled construction workers and miners / underground workers describe occupations that include a variety of sub-occupations within them. Each of these categories has specific skills. For example, within the skilled construction category shown in Table 5.2.1 there are likely to be a requirement for numerous specialist skills such as spray concrete (shotcrete), steel pile specialists, dewatering specialists, bentonite and slurry treatment experts amongst others. For miners / underground workers there are likely to be numerous sub-occupations such as tunnel boring machine (TBM) operators, grouters, tunnel loco drivers, excavated material removal experts and pit bottom operatives.

[iv] NVQs are national vocational qualifications. NVQ1 is the equivalent of three to four GCSE's grades D to E, NVQ2 is equivalent of four to five GCSEs grades A* to C. NVQ3 is the equivalent of two or more A levels, NVQ4 is broadly the equivalent of a Certificate of Higher Education and NVQ5 is broadly the equivalent of a Masters degree or doctorate.

5.2.12 A further breakdown of skilled construction and miners / underground categories is presented in Table 5.2.3. This is performed because these skills are diverse and often different to each other and a finer grained analysis could highlight any specific skills gaps. The jobs represent one employment year. The assumptions are based on information gained through consultation with the following organisations[v]:

a. British Tunnelling Society (BTS)

b. Thames Tideway Tunnel delivery team

c. Construction Skills

d. Tunnelling and Underground Construction Academy (TUCA).

Table 5.2.3 Thames Tideway Tunnel project estimated specialist skills by occupation

Occupations	No. per Year								
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**Total man years**
Miners / UG Workers									
TBM Operations	35	35	88	89	88	5	0	0	**340**
Tunnel Transport	58	59	147	148	147	8	0	0	**567**
Tunnel Backup & Plant	85	86	215	217	215	12	0	0	**831**
D-Wall* and Spray Concrete	101	102	255	256	254	14	0	0	**982**
Shaft miner	85	86	215	217	215	12	0	0	**831**
Pipe jacking	23	24	59	59	59	3	0	0	**227**
Sub-total	**388**	**392**	**979**	**986**	**978**	**55**	**0**	**0**	**3778**
Skilled Construction									
Marine Civils	24	59	82	74	105	80	8	2	**434**
Specialist plant – conveyors	24	59	82	74	105	80	8	2	**434**
Specialist plant – Cranes	31	74	103	94	133	102	10	2	**550**
Specialist Grouter	34	82	114	104	147	113	11	3	**608**

[v] For each occupational sub-category an estimate of the proportion of the total estimated jobs in the main category is made and then applied equally to each year.

Occupations	No. per Year								
	2015	2016	2017	2018	2019	2020	2021	2022	Total man years
Demolition	41	98	136	123	175	134	13	3	**723**
Ground contamination expert	24	59	82	74	105	80	8	2	**434**
Site power supply	28	67	92	84	119	91	9	2	**492**
Other skilled labour	119	286	397	360	512	392	38	9	**2112**
Sub-total	**325**	**784**	**1,088**	**986**	**1,402**	**1,073**	**104**	**25**	**5787**

*Source: URS analysis of 'Why Does London Need the Thames Tideway Tunnel?' Thames Water (2012) * Diaphragm Wall*

5.2.13 A key component of the workforce required to construct the project is employees involved in the transportation of materials into and out of the project worksites. The products transported principally include aggregates, concrete, precast tunnel segments, plant and machinery. The products taken away from the project site include excavated material to be recycled or sent to landfill. According to the *Transport Assessment,* which accompanies the application, approximately 8 million tonnes of material will need to be transported into and out of project sites over the course of the project.

5.2.14 Thames Water is keen to promote sustainable transport and encourage modal shift where it is feasible. Material will be moved by either lorry or barge. Barge movements will be required for the importation of material to fill cofferdams, to deliver aggregates and to remove excavated material from the project worksites.

5.2.15 There are not expected to be any significant labour or skills shortages in road based logistics and transportation. Responsibility for the transportation of goods principally falls to the sub-contractors and the wider supply chain. However, the transportation of material by river has been identified as potentially problematic regarding the capacity and skills of the local workforce.

5.2.16 It has been estimated that approximately 274 new marine transport employees will be required over the course of the project to support the transport of freight by water. The type and number of marine jobs are shown in Table 5.2.4 below:

Table 5.2.4 Thames Tideway Tunnel project estimated marine transport jobs

Tug crew				Ships			
Master	**Mate**	**Engineer**	**Bargeman**	**Master**	**Mate**	**Engineer**	**Deckhand**
21	21	21	21	38	38	38	76

Source: Thames Water (2012)

5.2.17 In addition to the direct marine transport employment outlined in Table 5.2.4 above the Thames Tideway Tunnel project team expects there to be a need for the sub-contractors to employ specific marine management personnel. The details of these employees are likely to be set out in a River Management Project Requirement document[vi]. Currently the Thames Tideway Tunnel delivery team expects the following specific river transport posts to be required:

a. marine operations manager

b. marine logistics manager

c. site marine coordinators

d. berthing coordinators.

5.2.18 Consultation with the Company of Watermen and Lightermen and analysis of Boatmaster Licences (BML) that include local knowledge endorsements suggest there are approximately 300 to 350 people with BMLs currently working on the tidal Thames[4]. However, the same consultation concluded that if the current situation continues by the peak year of the project there would be around only 200 people with appropriate BMLs with local knowledge. This is partly because the BML takes a minimum of two years to complete and the current take up is low.

Supply chain

5.2.19 The supply chain includes firms, organisations, technology and resources involved in moving the products and services from the supplier to the project. It is important to understand the characteristics and the types of job and skills that make up the supply chain as any shortfalls in capacity could have an adverse impact on the overall deliverability of the project.

5.2.20 Information on the potential supply chain to support the project has been gained through consultation with the Thames Tideway Tunnel delivery team and with the BTS, Construction Skills and TUCA. The supply chain is likely to include the following types of firm and specialism. These are grouped in relation to the demand likely to be generated by the project for their products and services[5]:

[vi] This document does not accompany the application. It is a guideline document that will support the requirements for the project's *Transport Strategy*, Site Based Navigational Risk Assessments and River Transport Management Plan, the latter as described in the *Code of Construction Practice (CoCP).* Once completed this document will also outline the requirements for the main contractors regarding the management of the river operations.

Higher Demand

a. concrete, cement and aggregate suppliers, major plant suppliers, tunnelling equipment, penstock and flap valves, marine civils, water and power supply, marine spoil logistics, construction design and management and skilled labour

Average Demand

b. diaphragm-wall contractors, demolition, utility diversions, ground contamination, steel structures, concrete segment manufacturers, slurry treatment, H&S, bentonite suppliers, shotcrete, site security and archaeology

Lower Demand

c. pumps and valves, ecology and environmental mitigation experts, fans and ventilation, SCADA software and controls, UXO clearance, utility strengthening and MEICA

5.3 Cumulative demand

Construction sector

5.3.1 To understand the potential cumulative demand for jobs and skills an investigation of the relevant sectors is made to set the context. This is presented in Appendix D**.**

5.3.2 Construction skills demand forecasts for the construction sector in London have been taken from the Construction Skills Network (CSN) projections for 2012-2016. The CSN assists the construction industry and its stakeholders with planning to meet future employment and skills requirements, by providing sector intelligence based upon robust data and analysing capacity, productivity and skills. The work is completed by Construction Skills in partnership with Experian. Construction Skills (also known as Construction Industry Training Board - CITB) are the Sector Skills Council and Industry Training Board for the construction industry.

5.3.3 According to the CSN, employment from construction within Greater London is expected to total 371,270 in 2016 which is a 6.2% increase on 2012's predicted level and 3% above the previous peak in 2010[6]. Whilst construction employment is expected to fall between 2012 and 2013 it is anticipated to rise between 2013 and 2016, increasing at an average rate of 0.9% per year.

5.3.4 The CSN annual construction skills recruitment requirement (ARR) for Greater London between 2012-2016 is shown in Table 5.3.1 below. It can be seen that the ARR for specialist building operatives is 340; this occupational category is likely to include many of the types of skills required to deliver the project and shown in Table 5.2.1 above[vii].

[vii] CSN figures have been preferred to GLA employment forecasts in terms of quantifying demand for skills due to their specificity to the construction sector and a greater degree of confidence in the robustness of the projections which are based on a model of consultation and primary research with key stakeholders.

Table 5.3.1 Greater London Annual construction skills recruitment requirement 2012-2016

Occupations	ARR 2012-16
Senior, executive, and business process managers	500
Construction managers	0
Non-construction professional, technical, IT, and other office-based staff	0
Wood trades and interior fit-out	0
Bricklayers	150
Building envelope specialists	0
Painters and decorators	0
Plasterers and dry liners	200
Roofers	0
Floorers	180
Glaziers	90
Specialist building operatives	340
Scaffolders	160
Plant operatives	80
Plant mechanics / fitters	0
Steel erectors / structural	50
Electrical trades and installation	0
Plumbing and HVAC trades	0
Logistics	0
Civil engineering operatives	<50
Non–construction operatives	0
Civil engineers	<50
Other construction professionals and technical staff	0
Architects	0
Surveyors	0
Total annual recruitment requirement	**1,750**

Source: CSN (2012) Note: The ARR in this table does include assumptions on demand generated by the major projects as described in the following sub-section. This is shown for indicative purposes and there is no element of double counting.

Local workforce and businesses

5.3.5 See additional information in the project-wide socio-economic impact assessment (see Volume 3 Appendix H of the *Environmental Statement*).

Within the 13 boroughs where project worksites are located there are approximately 2.4 million jobs and approximately 249,000 businesses (source: Experian 2012)[7]. Jobs are head count rather than full time equivalent, and businesses are business locations or units rather than enterprises). Businesses within the smallest size band (one to nine employees) account for 85% of jobs with the 13 boroughs, slightly less that within Greater London as a whole (88%).

Major projects

5.3.6 There are several other large construction projects occurring at a similar time to Thames Tideway Tunnel project. These projects, taken cumulatively, could generate increasing demand for skills and within the supply chain. Many of them also have, or will have, associated training schemes or activities to develop the capacity of supply chains, and so are an important part of the context for this *SES*. The projects considered are:

a. Crossrail

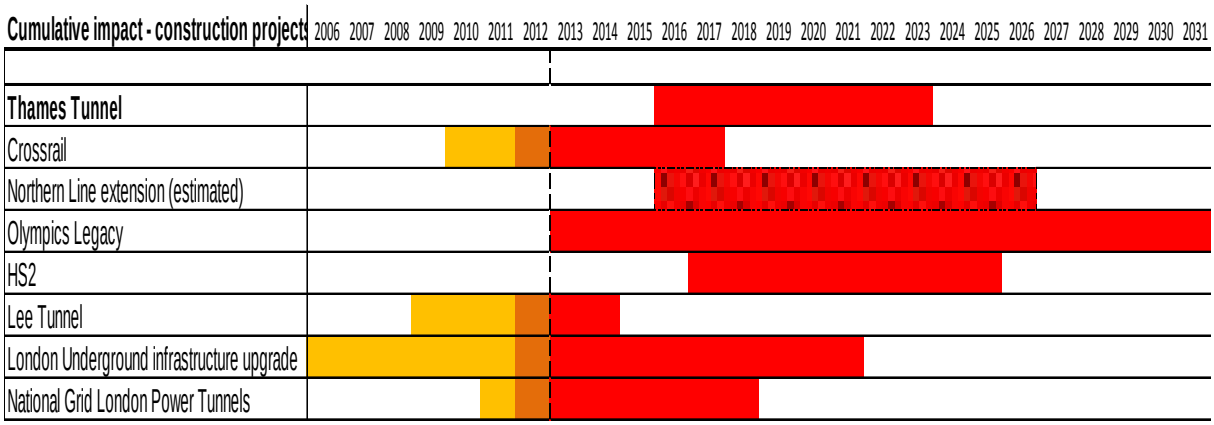
b. Northern Line Extension

c. Olympics Legacy Communities Scheme

d. High Speed 2

5.3.7 Further information on these projects is presented in Appendix E. The cumulative demand for construction and tunnelling skills from other major infrastructure projects is shown in Plate 5.3.1 below. It is clear from this assessment that during the construction period of the project there will be an increase in demand once the requirements of other projects are considered.

Plate 5.3.1 Cumulative demand for construction skills from major infrastructure projects in London



Source: Respective Employment and Skills Strategies and Planning Statements as discussed in this chapter.
Note: Red represent the future, orange the current year and yellow the past.

5.4 Summary

5.4.1 The project will take over six years to complete and will cost approximately £4.1billion. It will generate significant employment and demand for specific skills in the construction, tunnelling and freight by water sectors. At its peak it is expected that there will be approximately 4,250 direct construction workers. In addition there will be significant indirect jobs including around 274 river transport workers who will be required to transport material to and from the project sites.

5.4.2 Due to the complexity of the project a large variety of skills will be required. In particular there will a requirement for significant numbers of skilled construction workers and tunnelling specialists.

5.4.3 The additional demand for jobs will be experienced across all the boroughs affected by the project. It is estimated that the four most significant boroughs in terms of employment demand will be those where the key tunnel drive sites are located, ie, LB of Wandsworth, Southwark, Hammersmith and Fulham and RB Greenwich.

5.4.4 The project will generate demand in the local supply chain. The sort of companies, products and services that are most in demand include concrete, cement and aggregate suppliers, major plant suppliers, tunnelling equipment, penstock and flap valves, marine civils, steel structures, water and power supply, marine spoil logistics, construction design and management and skilled labour.

5.4.5 It is important to recognise the cumulative effects on demand for construction, tunnelling and freight by water employment and skills caused by the other major projects likely to occur at a similar time as the project. Crossrail, Northern Line Extension, High Speed 2 and other upgrades to infrastructure such as the London Underground and the National Grid in London will increase demand for these skills. Taking account of this cumulative demand ConstructionSkills estimates that there will be an annual requirement for around 1,750 additional construction workers in London.

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6 Jobs and skills supply analysis

6.1 Aims

6.1.1 This section considers the characteristics and capacity of the following elements of relevant supply:

a. workforce skills levels

b. training schemes

c. business support and major project initiatives

6.1.2 The aim is to understand whether the demand generated by the project as discussed in the previous section can be met. It also sets the context for the *SES* in terms of the skills, employment and educational levels of the local workforce compared to the London and UK level.

6.2 Workforce

Local workforce and businesses

6.2.1 The project passes through 14 London boroughs although there are no physical works taking place in Hounslow, and there is limited baseline information on employment and skills for the City of London due to the very low resident population. A schematic plan showing the route of the Thames Tideway Tunnel and the boroughs it passes through is provided at Plate 6.2.1 below.

6.2.2 Information is provided below on employment, local businesses, skills and qualifications and equality indicators for the 13 boroughs in which there are project worksites (hereafter referred to as the 13 relevant boroughs) and for Greater London. Supplementary information is provided within Appendix F.

6.2.3 Table 6.2.1 below illustrates the breakdown of businesses and jobs within the Construction, Manufacturing and Transport and Storage sectors, which are of particular relevance to the project, across the 13 relevant boroughs[8].

Plate 6.2.1 Schematic of the Thames Tideway Tunnel project

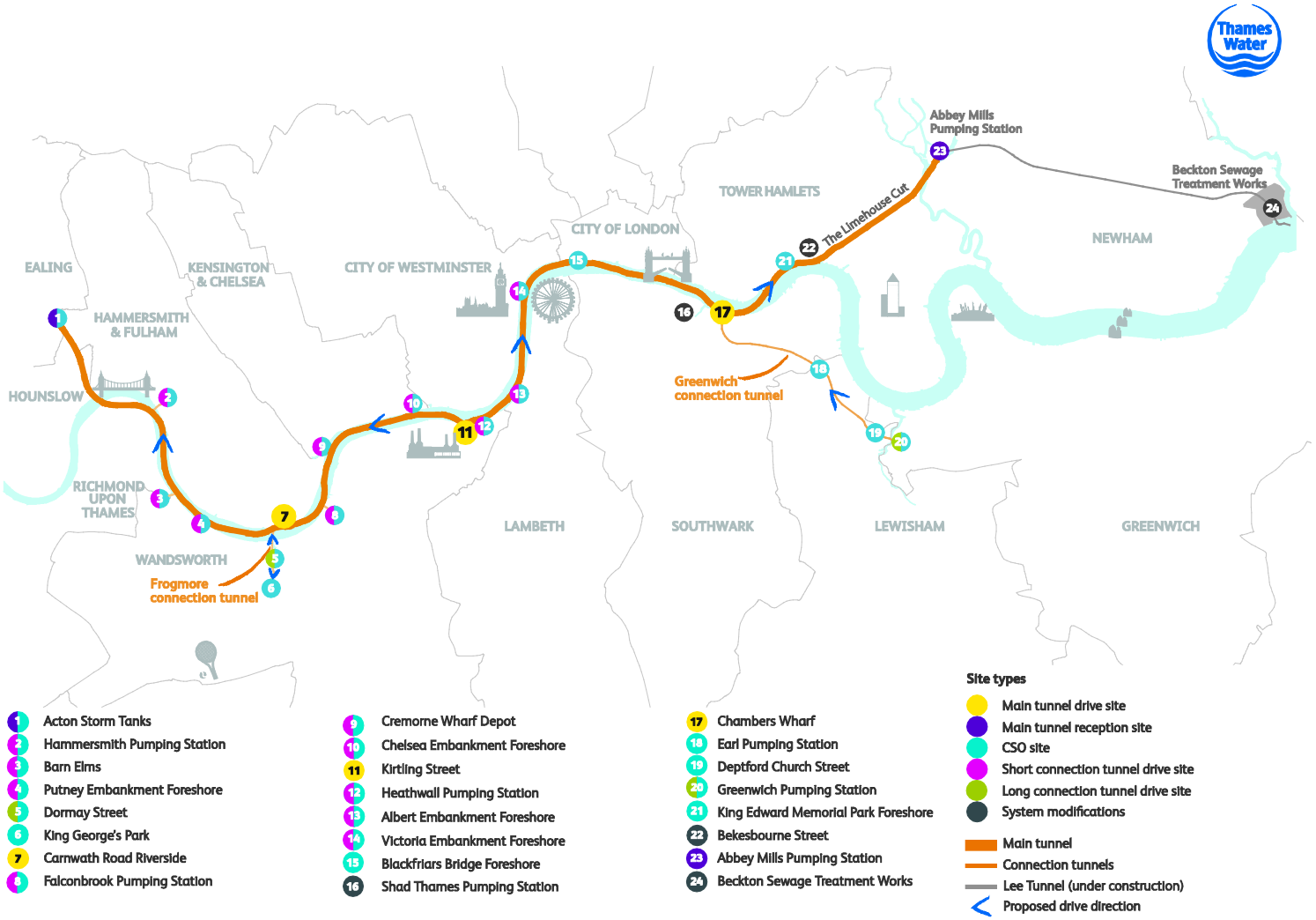


Table 6.2.1 Employment and business locations for the construction, manufacturing and transport sectors

	Construction sector		Manufacturing sector		Transport and storage sector	
Borough	**Jobs**	**Business locations**	**Jobs**	**Business locations**	**Jobs**	**Business locations**
City of London	8%	2%	5%	3%	4%	3%
Ealing	11%	14%	14%	12%	14%	14%
Greenwich	6%	8%	4%	6%	7%	6%
Hammersmith and Fulham	5%	6%	12%	7%	7%	7%
Kensington and Chelsea	4%	4%	7%	5%	3%	4%
Lambeth	7%	7%	7%	7%	5%	8%
Lewisham	5%	8%	4%	7%	4%	7%
Newham	7%	7%	5%	6%	16%	8%
Richmond	5%	8%	4%	7%	5%	6%
Southwark	5%	6%	5%	8%	7%	8%
Tower Hamlets	7%	5%	8%	7%	10%	8%
Wandsworth	6%	9%	5%	9%	6%	8%
Westminster	24%	15%	20%	15%	12%	12%
13 boroughs	89,052 (100%)	12,610 (100%)	69,609 (100%)	7,161 (100%)	69,722 (100%)	5,871 (100%)
Greater London	228,405	39,213	168,410	20,553	174,390	15,777

Source: Experian (2012)

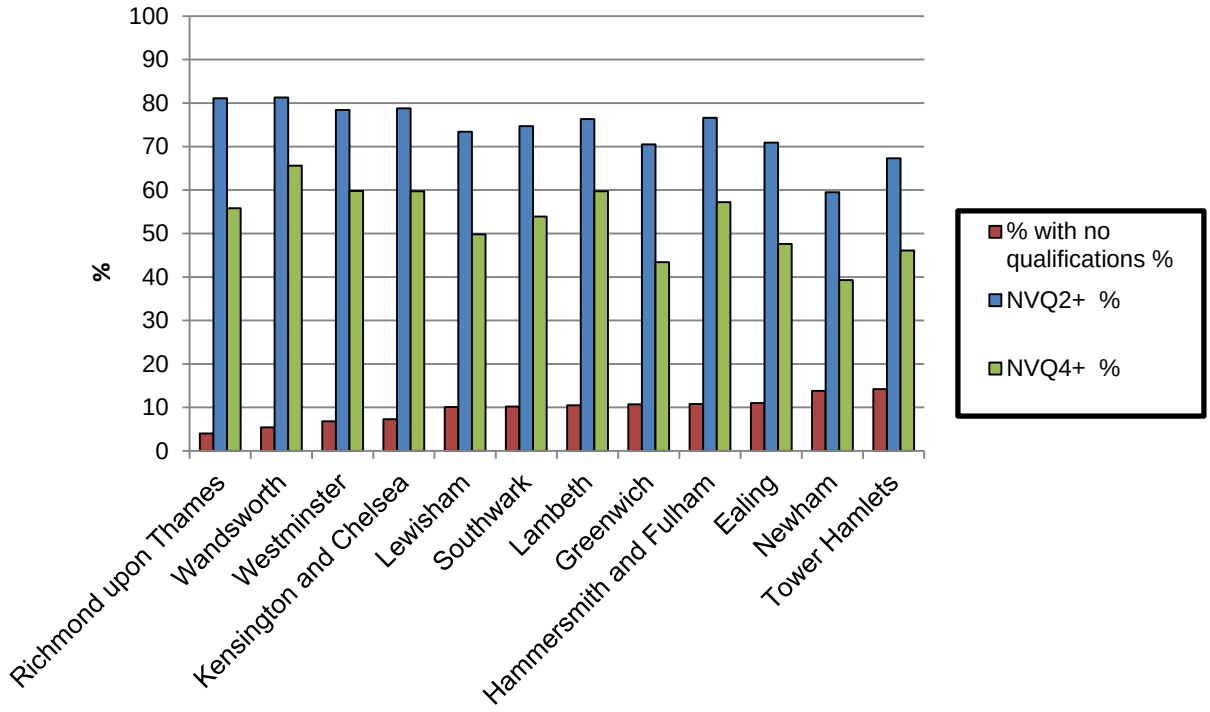
Local qualifications and skill levels

6.2.4 Plate 6.2.2 below show the percentage of those residents in the relevant boroughs with no qualifications and NVQ2 and NVQ4 qualifications as sourced from Office of National Statistics (ONS) data[9]. As described in the demand section, in general NVQ2 equivalent is the level required for most of the skilled construction and tunnelling workers.

6.2.5 This analysis show that 9.3% of Greater London residents have no qualifications, slightly less than across Great Britain as a whole (10.6%). 71.4% of residents have qualifications equating to NVQ2 or higher, slightly more than within Great Britain as a whole (69.7%). A considerably greater proportion of Greater London residents has qualifications equating to NVQ4 or higher (45.9%) than within Great Britain as a whole (32.9%).

6.2.6 The proportion of residents educated to NVQ2 or above within the relevant boroughs is broadly in line with, or greater than, levels within Greater London (71.4%) and Great Britain (69.7%) as a whole, with the exception of the LB of Newham (59.5%) and LB of Tower Hamlets (67.3%).

Plate 6.2.2 Workforce qualifications



Source: ONS (2012)

Construction, tunnelling and river transport specific skills

6.2.7 The current and future skills levels available in the relevant London boroughs for the specific sectors required to deliver the project are not straightforward to quantify. For example, there is no definitive dataset that quantifies the skills levels of construction, tunnelling and barge operating workers in London as is available for more general indicators of skill levels and qualifications such as provided by the Experian data and shown in Table 6.2.1 above. However, information on current and future levels of

specific relevant skills has been obtained through consultation with the following stakeholders:

a. London Colleges
b. BTS
c. Construction Skills
d. TUCA
e. Crossrail
f. Company of Watermen and Lightermen
g. Thames Tideway Tunnel delivery team.

Construction skills supply

6.2.8 Consultation indicated that the construction sector in London generally has a relatively adequate supply of skills to meet demand. This is to be expected given the size of the market, availability of labour and high quantity of construction projects. However the Construction Skills / Experian CSN modelling as described above describes the supply of construction skills in Greater London. The key shortfalls of skills supply identified relevant to the project are Specialist Building Operatives (340 annual requirement), Plasterers and Dry Liners (200 annual requirement), Floorers (180 annual requirement) and Plant Operatives (80 annual requirement). The CITB expects this to occur in the period 2012 to 2016.

Tunnelling skills supply

6.2.9 Consultation indicated that the supply of tunnelling skills is relatively difficult to quantify. The tunnelling sector is seen as relatively informal in terms of training required by contractors and many of the firms are small family based companies that travel around the world for tunnelling contracts. Many of the workers learn the skills on the job and work their way up from more basic positions to roles with more responsibility over a long period of time.

6.2.10 The BTS suggests that, based on current estimates of resource capacity, future demand mainly linked to large infrastructure projects such as the project and Crossrail will outstrip current supply by 2015 / 16.

6.2.11 TUCA in conjunction with consultants MACE produces a proprietary demand and supply model that identifies where there are specific gaps in the supply of tunnelling skills. When these gaps are identified contractors have the ability to send workers specific courses at TUCA.

River transport skills supply

6.2.12 The number of people employed in Greater London in the barge and ship operation industry in total is estimated by the PLA to be approximately 1,900 (PLA Economic Impact Assessment, 2009)[10].

6.2.13 According to consultation with the Company of Watermen and Lightermen the current supply of people with skills relevant to the freight by water sector is relatively small and declining at approximately 10% per annum. There are currently around 375 people with Boatmaster licences with local

knowledge endorsements operating on the Greater London portion of the Thames. This includes approximately 75 at commercial tug and barge operation companies and the remainder working at tourist and passenger boat operators. Approximately 100 boatmasters working at passenger and tourist boat companies have previous experience working on barges and tugs and therefore theoretically have the skills to be able to transfer to work on the project if demand existed. However, these 100 boatmasters would be unlikely to transfer to freight given the passenger vessel industry is likely to be more lucrative. The current baseline of total boat and ship workers in Greater London is estimated by the PLA to be 1,900[11]. Assuming the attrition rates mentioned above it is estimated that by 2019 there would be approximately 1,000 ship and boat workers in total including approximately 200 boatmasters.

Unemployment, equality groups and deprivation

6.2.14 The project will pass through boroughs with issues of unemployment, deprivation and economic inactivity. The project with its significant employment generation presents an opportunity to help address some of these issues by creating jobs that could be taken by local people. Table 6.2.2 below shows economic activity rates, unemployment rates, economic inactivity amongst ethnic minorities[12] and percentage of 16 to 18 years olds not in education, employment or training (NEETs)[13] for the 13 relevant boroughs and Greater London. In general, the following boroughs appear to have the most significant issues of worklessness and economic deprivation:

a. LB Newham
b. LB Tower Hamlets
c. LB Lewisham
d. LB Lambeth
e. RB Greenwich
f. LB Southwark
g. LB Ealing.

Table 6.2.2 Economic activity, employment and 16-18 year olds not in education, employment or training (NEET)

Borough	Economic Activity Rate (16-64)	Employment Rate (16-64)	Unemployment Rate (16-64)	Ethnic Minority Economically Inactive (16-64)	Estimated number NEET (16-18 year olds)	% NEET
City of London	-	-	-	-	10	0.3%
Ealing	75.1%	66.7%	11.2%	32.7%	320	8.9%
Greenwich	77%	68.2%	11.4%	25.5%	410	11.4%
Hammersmith and Fulham	74.3%	67.1%	9.6%	39%	160	4.4%
Kensington and Chelsea	68.9%	64.3%	6.7%	44%	130	3.6%
Lambeth	81.6%	72.3%	11.3%	25.4%	270	7.5%
Lewisham	75.4%	68.4%	9.2%	24.2%	470	13.1%
Newham	67.5%	57.1%	15.3%	34.4%	520	14.4%
Richmond upon Thames	77.5%	73.9%	4.7%	30.9%	180	5%
Southwark	74.9%	66.4%	11.4%	32.6%	330	9.2%
Tower Hamlets	69.7%	60.5%	13.2%	42.7%	370	8.4%
Wandsworth	81.6%	76.9%	5.8	31.3%	260	7.2%
Westminster	69.3%	63.8%	8%	42.3%	170	4.7%
Greater London	**75.1%**	**68%**	**9.5%**	**31.1%**	10,910	4.5%
Great Britain	**76.5%**	**70.2%**	**8.2%**	**32%**	108,490	6.1%

Source: Nomis (2011), Department for Education (2012)

6.3 Skills and training provision

Skills and training providers

6.3.1 Information on the supply of skills and training provision relevant to the delivery of the Thames Tideway Tunnel project was based on literature review, internet research and consultation with key stakeholders such as London Colleges, TUCA and Construction Skills.

6.3.2 Generally there appears to be a wide variety of institutions that provide comprehensive construction skills training. Further Education (FE) colleges provide general construction skills training and where necessary refer people to the more specialist national construction colleges such as TUCA. There are numerous FE colleges catering for Greater London residents. There are also several specialist construction skills colleges and Higher Education (HE) providers that provide specialist tunnelling courses. A sample of construction skills training and education providers are shown below:

London FE colleges

a. Lewisham College
b. Lewisham / Greenwich Christ the King College
c. Greenwich Community College
d. Newham College
e. Newham Sixth Form College
f. Tower Hamlets College
g. Southwark College
h. Westminster Kingsway College
i. Richmond upon Thames College
j. City of Westminster College
k. Richmond Adult Community College
l. Kensington and Chelsea College
m. Lambeth College
n. Ealing, Hammersmith and West London College
o. Hackney College
p. Wandsworth – South Thames College.

HE specialist construction course providers

a. Brunel University
b. Power Academy' (Institute of Electrical Engineering and Technology)
c. Imperial College
d. University College London
e. Birmingham University
f. Cambridge University
g. City University
h. East London University
i. Loughborough University
j. York University
k. Southampton University
l. Warwick University, MSc Tunnelling and Underground Space
m. South Bank University.

Specialist providers

a. Waltham Forest National Construction College
b. Beckton Park National Construction College
c. Tunnelling and Underground Construction Academy - TUCA (Ilford, East London)
d. The National Construction College South (Erith, Kent)
e. TunnelSkills, Surbiton.

6.3.3 TUCA is a specialist tunnelling and construction skills college that currently provides training mainly for the Crossrail project. TUCA is the only known purpose built training facility for the tunnelling sector and clients come from all over Europe and the world to practice and obtain skills. It features a mock pit head, 40 metres of tunnel with locos that can be driven into the tunnel, a concrete laboratory and a unique testing facility for spray concrete.

6.3.4 Apart from the recently initiated Maritime Occupations Framework training and apprenticeship system run by the TTA, there has historically been limited training provision for freight by water skills. Consultation with the PLA and the Company of Watermen and Lightermen suggests that most training is currently ‘on the job’.

6.4 Supply chain

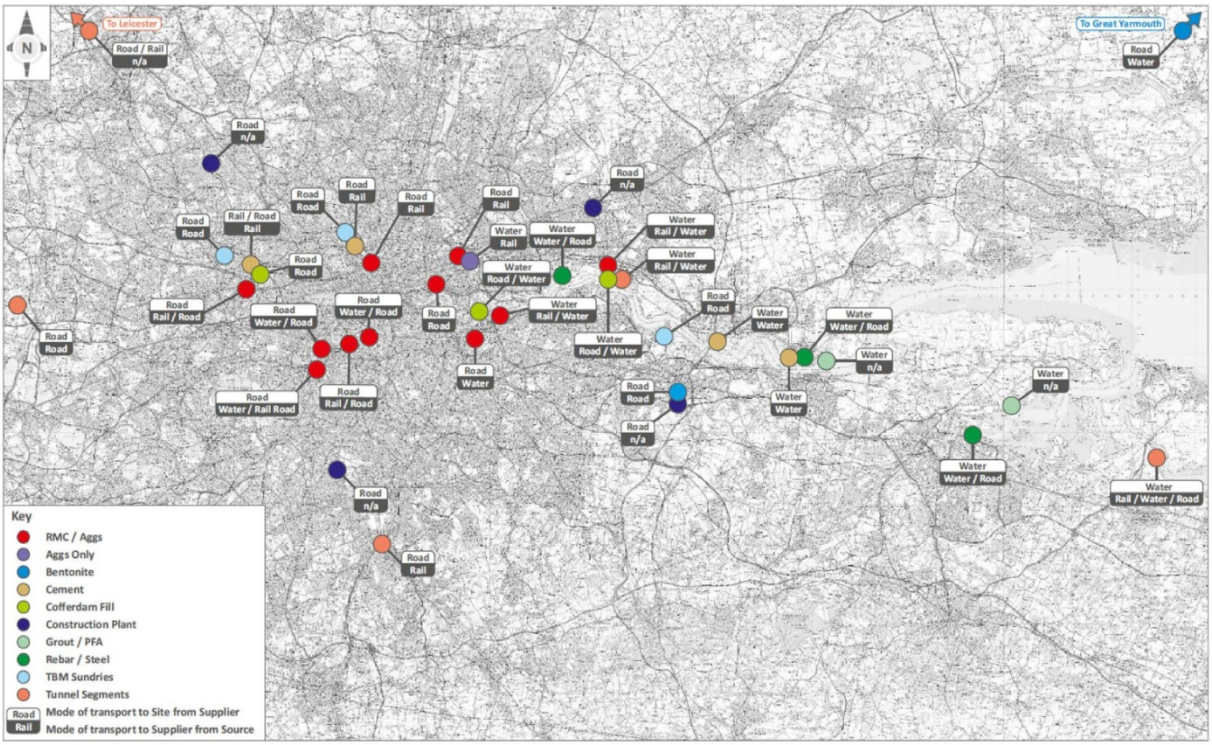
Supply chain assessment

6.4.1 In the demand section the supply chain required to meet the demand generated by the project was described. The capacity and location of the

supply chain can vary depending on the level of specialisation of the goods and services being provided.

6.4.2 Given that London is the UK's largest city and thus has a large construction sector, many of the supply chain firms are likely to be relatively close to the project sites. To illustrate the point with regard to one element of the supply chain, Plate 6.4.1 shows the approximate location of companies which could supply concrete and related materials.

Plate 6.4.1 Thames Tideway Tunnel approximate location of potential concrete supply chain



Source: Thames Tideway Tunnel Transport Assessment (2012)

6.4.3 It is estimated that the elements of the supply chain with the least capacity, and therefore potential pinch points, are as follows:

Medium capacity

a. steel piles, TBM water supply, marine civils, dewatering specialists, penstock and flap valves, bentonite, major plant equipment, slurry treatment, specialist grouting, shotcrete.

Low capacity

a. construction design and management, barge spoil logistics, skilled marine labour, marine transport.

6.5 Summary

6.5.1 The supply of skills and employment necessary to meet the demand generated by the project in the 13 relevant London boroughs (ie, those where project worksites are located) could be summarised as being relatively adequate in many key areas. However, there are key deficits in

the supply of particular skills required by the project, namely tunnelling and particularly barge operation. Construction Skills Network has identified that in London there will be an annual construction recruitment requirement of around 1,750 new workers a year to meet demand. Many of these skills are relevant to the project.

6.5.2 There are also certain affected boroughs where underlying issues of deprivation may be addressed positively through the employment opportunities presented by the project. These boroughs include Newham, Tower Hamlets, Lewisham, Lambeth, Greenwich, Southwark and Ealing.

6.5.3 There is generally a well-developed training infrastructure to meet general construction skills training needs. For example there are numerous training organisations, Further and Higher Education Colleges and specialist training centres such as TUCA and the National Construction College. These training organisations offer a variety of construction skills courses. There are bodies that advocate skills development and jobs brokerage for the industry such as Construction Skills, TunnelSkills and JobCentre Plus and there is funding for apprenticeships and training courses provided by the Skills Funding Agency and BIS.

6.5.4 The supply chain is generally well developed and connected as might be expected in a settlement of London's size and significance. However, there are potential pinch points in the local supply chain. For example, there may be particular shortage of skills relating to management and design of construction, barge spoil logistics, skilled marine labour and marine transport supply chain.

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7 Gap analysis

7.1 Aims

7.1.1 The aim of the gap analysis is to compare the demand for jobs and skills generated by the project against the existing supply of local workforce, skills and training provision. This allows an assessment of whether there are particular shortfalls that could potentially be addressed through specific actions.

7.2 Approach

7.2.1 The gap analysis considers the following elements.

a. jobs, skills and supply chain gap

b. training provision gap.

7.2.2 Jobs, skills and supply chain are grouped together in considering categories of demand. This is because the demand for, and supply of, jobs, skills and supply chain to enable the project to be delivered are generally inter related. For example, shotcrete specialists are a category of job, a skill and an individual contractor firm that is part of the supply chain.

7.2.3 The analysis takes account of both demand generated by the project and the cumulative effect of other major projects which are likely to occur at a similar time in London - such as Crossrail, High Speed 2 and Northern Line Extension.

7.2.4 Once the jobs, skills and supply chain gap analysis is performed ways of addressing the gap through training or by relying on the wider labour market (national or international) to supply that skill or job can be determined. This takes account of the availability of training provision as discussed in Section 6. It allows potential conclusions to be made on the prioritisation of initiatives to address the skills gap. For example, it may be that particular skills such as tunnelling are so specialised that it is logical and more efficient that they are addressed by the international labour market. In this scenario it is therefore likely to be more acceptable for a skills gap to occur at the local level. Specific gaps such as this will be difficult or challenging to address through a particular strategy and so it may be that resources and effort would be better placed addressing a skill that has the potential to embed itself more easily at the local level – for example, steel fixing or barge operation.

7.3 Jobs, skills, supply chain and training gaps

7.3.1 The following gap analysis (Table 7.3.1) builds on the analysis of the previous sections. The main source of information was the consultation exercise with key stakeholders and the CSN demand forecasts for London. It presents the potential ‘pinch points’ in supply necessary to meet demand. The gaps are not presented in a quantitative format. This

is because although there are figures for the approximate numbers of jobs and skills in demand there is no reliable figure for the total supply of that particular skill or job in the local or wider labour market to compare it against.

7.3.2 The analysis assumes demand and supply at the peak construction year because this is effectively the worst case scenario that should be addressed through the *SES*. Potential ways the gap could be addressed are then considered. This takes account of the training provision analysis and the potential supply of the particular skill in the international labour force. In the table below (Table 7.3.1), a tick is provided to indicate the most appropriate way of addressing the gap. In some circumstances there are multiple ways the gap could be addressed and for these two ticks are provided to indicate the relative significance and priority.

Table 7.3.1 Jobs, skills, supply chain and training gap analysis

		How skills gap could best be addressed		
Demand **Job / Skill / Supply Chain**	**Gap identified**	**Short Term Training (up to 6 months)**	**Longer term training (6m to 3+ years)**	**Additional demand met by national and then international workers**
Construction Design and Management	Y		✓	
Engineering Professionals	N			
Electricians	N			
Mechanical Fitters	N			
Steelfixers	Y	✓		
Miners / UG Workers	Y	✓	✓	✓
Labourers	N			
Skilled Construction	Y	✓✓	✓	
Specialist Security	Y	✓		
Marine Logistics – Boatmasters	Y		✓	
Marine Logistics – Bargehands	Y	✓	✓	✓

7.3.3 There are various ways the skills gaps shown in Table 7.3.1 above could be addressed. Many of the skills gaps can be addressed by short term training schemes delivered at a local level by the existing construction

training infrastructure. For example steelfixers, specialist security and many of the specialist construction skills could be addressed by training new workers or retraining the existing construction workforce at FE colleges. Many of the courses, which are expected to be NVQ2 level, can be completed within six months. The exception is marine logistics bargehands. Although they can probably be trained in a relatively short timeframe there is currently a significant shortfall of workers who could be re-trained and there is limited existing training provision, apart from the TTA training and apprenticeship scheme, to meet this need. For this reason it is stated in Table 7.3.1 that some of the demand could be met by national or international workers, for example from areas with relatively established workforce such as the North East of England.

7.3.4 Construction design and management professionals require longer term training. This could potentially be provided by HE institutions. Also some of the skilled construction training could take longer than six months. However, it is too early to say with precision which specialist construction skills would be required and what their training needs would be. For example, Crossrail addresses a similar issue through its supply and demand model which is an interactive model of demand for particular skills matched to existing training provision.

7.3.5 Some of the gaps in tunnelling skills could potentially be addressed through short to long term training courses. This currently occurs at TUCA for the Crossrail project. The Crossrail supply and demand model is used to project the detailed training requirement for the TUCA courses. However, some of the gaps in tunnelling skills are likely to be too specialised to justify investment in training schemes given the structure of the industry and the supply of skills internationally. For example, although London does have a significant amount of tunnelling projects planned, many of the skilled and specialised jobs working on the TBM could easily be met by international contractors as currently occurs on most tunnelling projects.

7.3.6 The most significant gap occurs for marine logistics boatmasters. People operating freight vessels on the tidal Thames need to have local knowledge and an understanding of the river and the courses take a minimum of two years to complete. Therefore marine logistics boatmasters fall into the longer term training category.

7.4 Magnitude of gap

7.4.1 The types of skills gaps vary in type and degree. This is why a range of potential options have been developed for how they might be addressed. To guide a more comprehensive strategy to address these gaps it is helpful to try to assess the relative magnitude of each of the specific gaps. This will help to prioritise potential actions and initiatives.

7.4.2 The magnitude of gap considers the following factors:

a. extent of the gap, when considered against the local baseline of that particular skill

b. potential impact of the gap on the deliverability of the project ie, if a particular skills / job category cannot be delivered would it make the overall project undeliverable? Are there alternative delivery solutions?

c. options for alternative supply of that skill ie, if the skill cannot be delivered locally through a training scheme can a substitute be found by sourcing through the national or international labour market?

d. potential for the skill gap being closed naturally by the market.

7.4.3 The above factors are assessed qualitatively to arrive at the analysis on the magnitude of the skills / jobs / supply chain gaps as discussed in Table 7.3.1 above. The magnitude analysis is presented in Table 7.4.1 below:

Table 7.4.1 Magnitude of skills / jobs / supply chain gap

Job/Skill/ Supply Chain Gap	How Addressed	Magnitude of Gap			Justification
		Low	Med	High	
Construction Design and Management	Long term training (LTT)		✓		High gap identified across London by CSN report and significant potential impact on project if not addressed but given high wages potential for transfer from other sectors
Steelfixers	Short term training (STT)		✓		Fairly significant gap but ability to train in short period if gap identified and potential for national and international labour to fill gap if required
Miners/ Underground Workers	Partly international labour but also STT & LTT	✓			Although specialised skills there is an ability to rely on international labour to fill gap at same times as opportunity through TUCA to train locally
Skilled Construction	Mainly STT but also LTT		✓		Specialised skills that would have high project impact if not delivered but ability to train locally and/or recruit nationally or internationally if required
Specialist Security	STT	✓			Relatively short term training needs and potential to divert from other security firms if required
Marine Logistics – Boatmasters	LTT			✓	Very significant gap in demand generated by project compared to local supply and very limited opportunities for substitution
Marine Logistics –	STT, LTT and		✓		Ability to recruit from national / international labour market but

Job/Skill/ Supply Chain Gap	How Addressed	Magnitude of Gap			Justification
		Low	Med	High	
Bargehands	international Market				large gap in supply against demand

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PART 2: Skills and employment strategy

8 Context and rationale for the Skills and Employment Strategy

8.1 Introduction

8.1.1 This section draws together the findings from the evidence presented in Part 1 (Sections 1-7 of this document) as well as other important context information including the best practice review and consultation, in order to establish the most important drivers for the *SES*.

8.1.2 The consideration of the rationale for the *SES* and the key factors shaping its development provide a basis for formulating the *SES* objectives and subsequently Thames Water's proposed *SES* activities.

8.2 Project delivery

8.2.1 To deliver the project, a large workforce is required with a wide range of skills.

8.2.2 The gap analysis (Section 7) found potential skills shortages in a number of occupations, in particular river transport, construction design and management, and skilled construction. While at an international level the relevant skills are likely to be available, a variety of training programmes could help increase the supply of local and UK-based workers and secure project delivery. For example, as set out in Section 7:

a. longer term training could be required to meet demand for boat masters, construction design and management, skilled construction and miners / underground workers

b. short term training could be required to meet demand for marine bargehands, skilled construction, steelfixers, mining / underground workers, and specialist security.

8.2.3 Timely delivery of the Thames Tideway Tunnel project is required to ensure compliance with European environmental water quality standards and related UK regulations. Moreover, the project must be delivered to the highest possible standards of H&S.

8.2.4 Cost effectiveness is also a key consideration for the Thames Tideway Tunnel project, as costs will be reflected in increased bills for Thames Water's customers.

8.3 Corporate sustainability objectives

8.3.1 Thames Water is integrating corporate responsibility measures across its business practices. The '*Thames Water Annual Performance Report*' (2011 / 2012)[14] states:

"To ensure that we provide a service on which future generations can rely, we need to strike a balance between the level of service we provide, our impact on the environment, and the level of customer bills."

8.3.2 Thames Water's commitment to skills and employment is reflected in its nine sustainability themes which inform Thames Water's future plans, which include *"Sustainable workforce - employment and employability".*

8.3.3 The *Sustainability Statement,* which accompanies the application, includes eleven sustainability themes which aim to ensure that consideration is given to promoting better social, economic and environmental outcomes. Two of these themes are directly relevant to the *SES*:

a. economy: promote a strong and stable economy

b. population, human health and equality: ensure the safety, health and support well-being of communities in which the project operates and encourage equality and sustainable communities.

8.4 Legislative and policy drivers

8.4.1 As set out in Section 4 the Thames Tideway Tunnel project is a NSIP under the 2008 Act. The NPS[15] provides the primary basis for determining the application. It highlights regional and local job creation as one of the socio-economic issues that could be considered within the assessment.

8.4.2 In addition, the *London Plan 2011* forms a strategic policy framework and together with the *Mayor's Economic Development Strategy for London 2010* supports infrastructure projects and highlights their potential economic benefits. Borough LDFs and local economic development strategies also inform the context for the project.

8.4.3 As stated in the NPS (para. 3.2.1) all proposals that are subject to the European EIA Directive must be accompanied by an *Environmental Statement* describing the aspects of the environmental likely to be significantly affected by the proposed development. The *Environmental Statement* which accompanies the application finds that the construction and operation of the Thames Tideway Tunnel project would lead to beneficial socio-economic effects for certain workers and industries at the project-wide (Greater London) level[viii]. The activities set out in this *SES* have the potential to complement and further enhance those benefits.

[viii] Job creation and increased skills levels are judged to be moderate beneficial effects on the Greater London workforce within the project-wide socio-economic impact assessment. See the project-wide socio-economic impact assessment (*Environmental Statement* Volume 3 Section 10).

8.5 Socio-economic context

8.5.1 Section 6 indicates that many of the London boroughs through which the project passes experience high levels of unemployment and economic inactivity. It is likely that some sections of the community experience persistent barriers to employment, for example due to low skills levels or disability.

8.5.2 This implies that the jobs and spending associated with the project could provide an opportunity to realise important benefits in these communities, as well achieving wider goals associated with improved water quality. Employment has wide-ranging benefits for the individual but also for the wider economy and community. The economic opportunities include direct jobs, estimated to peak at approximately 4,250, but also indirect employment resulting from economic multipliers within the wider economy.

8.5.3 Thames Water must comply with legal requirements, for example in terms of H&S, but has also identified opportunities to go beyond legal compliance towards best practice in terms of maximising the social benefits of the project and to leave a meaningful and positive legacy. Thames Water aims to draw from the lessons from past major development projects and to work in partnership with existing local stakeholders who offer considerable existing expertise and resources in order to define and work towards best practice.

8.6 Summary

8.6.1 The *SES* arises from and is shaped by a number of drivers. Most fundamentally, the successful delivery of the project depends upon securing specific skills, goods and services. The legal and policy framework supports the optimisation of socio-economic benefits and requires due diligence with regard to H&S requirements.

8.6.2 Thames Water also seeks to move beyond legal compliance towards best practice with regard to maximising the economic benefits of the project, as reflected in its corporate sustainability objectives and the *Sustainability Statement* accompanying the application.

8.6.3 Many of the communities through which the main tunnel passes are characterised by incidences of high unemployment, economic inactivity and deprivation; the socio-economic context therefore implies opportunities to realise considerable benefits for local communities as well as for society and the economy more widely.

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9 Objectives and Activities

9.1 Introduction

9.1.1 Given that there is a vast range of potential objectives and activities relating to skills and employment, it is important to identify the priorities which are most effective for Thames Water to pursue.

9.1.2 The four objectives which have been identified articulate the high level goals of the *SES*, and will be achieved through a series of *SES* activities. Both the objectives and the activities reflect the evidence base and rationale set out in the previous sections.

9.1.3 Below, each objective is described including justification, scope and target beneficiaries. The activities which sit beneath each objective are then set out. The relationship between the objectives and activities is also described.

9.2 Objective 1: Achieve exemplar standards of health, safety and well-being

9.2.1 A 'Zero Harm, Zero Accidents, Zero Compromise' approach has been adopted for the project, signalling that the well-being of the workforce is the top priority. This approach will involve the creation of a construction regime that can realistically deliver this huge project without a single major injury incident occurring to any of the project workforce. Thames Water intends that delivery of a transformational H&S performance that "moves the market" is a key element of the project's legacy.

9.2.2 Health, safety and well-being considerations will be fundamental to Thames Water's approach to the *SES*. All workers will be equipped with the full range of skills required to successfully deliver the project while meeting the Target Zero ambition.

9.2.3 Each worker will require H&S and basic skills training appropriate to his or her role, and an understanding of project and site-specific systems and protocols. However Thames Water also aims to embed behavioural safety within working practices, and to engender a positive project culture and a positive relationship with the project workforce.

9.2.4 In terms of scope and target beneficiaries, this objective relates mainly to the workforce working on and in the vicinity of the project sites. However in taking a comprehensive and long-term view of H&S, for example in considering wide-ranging potential environmental impacts and aiming to leave a legacy of increased H&S standards, this objective also aims to benefit other workforces and communities further afield.

9.2.5 Activities to achieve this objective are set out below.

Develop a culture and systems to ensure Health and Safety is seen as the top priority

9.2.6 The fundamental importance of health, safety and well-being on the project will be communicated to the workforce. All workers will receive appropriate H&S and basic skills training, with an emphasis on behavioural safety within working practices.

9.2.7 Thames Water will put a series of H&S systems and protocols in place which will improve workers' H&S awareness and skills. For example, the Working Instructions will describe requirements to adhere to: project-wide systems for near-miss reporting; the Considerate Construction Scheme; and a pro-active approach to health screening and occupational health.

An ethos of one-to-one engagement with the workforce

9.2.8 Thames Water will embed the principle of one-to-one engagement within the project culture. While project workers will largely be employed through contractors, Thames Water will be a visible and engaged client.

9.2.9 Thames Water will implement a Supervisor Leadership programme across the project. Driven from a senior level, this initiative will encourage contractors to employ working practices which promote engagement with and amongst the workforce, for example one-to-one sessions between project managers and all on-site workers.

9.2.10 Thames Water believes that this approach will be of significant importance in delivering a transformative H&S performance. It will raise H&S awareness, facilitate effective training, improve security and reduce staff turnover. It will positively influence the behaviour of the workforce and allow Thames Water's H&S values to be cascaded down through the supply chain.

A project-wide smart card system

9.2.11 Thames Water will implement a project-wide H&S smart identification (ID) card system. Each worker's card will hold a range of data, potentially covering employment history, training, health screening and key technical skills.

9.2.12 As well as providing security control, this system will enable Thames Water to help plan skills requirements and to ensure each worker has completed the required training. It will allow a profile to be built up of each employee, and will facilitate individual engagement with each worker.

9.2.13 The smart card system will be designed to fit with other card schemes such as Construction Schemes Certification Scheme (CSCS) card and, if relevant, TUCA underground passports.

Workforce training

9.2.14 Contractors will be required to ensure that workers receive all H&S training necessary to fulfil their role and successfully deliver on the Target Zero ambition, and to formulate and report upon a workforce H&S training plan to evidence this.

9.2.15 As well as covering project-wide and site-wide inductions and risks associated with the worker's specific role on the project, training requirements will include basic skills such as ensuring all workers adequately speak English.

'Project Hubs'

9.2.16 The Project Hubs will provide space and resources to help administer initiatives to meet this objective.

9.2.17 It is envisaged that the Project Hubs will be created at each of the key tunnel drive sites (which represent the project's employment nodes). They will provide space for H&S and basic skills classes including English language classes, and internet resources for workers. They will also provide office space for project staff (for example, administration, security, and skills / job brokerage staff) and act as a base for community liaison and outreach activities; these are described in Sections 9.3 and 9.4.

Health and safety forum

9.2.18 A H&S forum will be formed to lead activities relating to H&S skills and training, and to achieve Objective 1.

9.2.19 Its core membership will comprise senior executives from Thames Tideway Tunnel, Thames Water; contractors, and other key stakeholders. It will be supported by an internal Thames Tideway Tunnel professional team. The Forum will also have a wider membership which will supply additional resource and expertise in order to help achieve Objective 1.

9.3 Objective 2: Ensure that a suitable workforce with the right skills is available to deliver the project

9.3.1 To successfully deliver the project in a cost effective and efficient way which achieves value for money for Thames Water customers and other stakeholders, a workforce with the right skills must be accessible. Thames Water will therefore support the development of relevant skills and sectors, building the capacity of the workforce and the supply chain where gaps have been identified.

9.3.2 As set out in Section 5, the Thames Tideway Tunnel project requires a wide range of skills and employees, and therefore a wide range of training and education courses are relevant, including short term courses and on-the-job training; longer term courses such as degrees; and basic skills relating to language, job-readiness and H&S. Meeting this objective will require detailed research and monitoring in order to establish needs and adequately plan for them.

9.3.3 There is an extensive network of skills and training providers and funders which Thames Water can work with in this arena. Thames Water can also capitalise on synergies with Crossrail and other major infrastructure projects, and is already engaging with other these projects to explore potential overlaps in skills and training requirements.

9.3.4 Thames Water aims to leave a useful and lasting legacy, so skills and the associated support infrastructure used on the project can be utilised by other projects, helping ensure that London and the UK is a world leader in the delivery of large scale infrastructure projects.

9.3.5 In many instances, the beneficiaries of any such intervention around skills and training will be Greater London residents who can be trained up to meet a skills gap arising out of the project. It is however also likely that some beneficiaries will come from other parts of the UK or even abroad, especially for more specialised occupations.

9.3.6 Activities to achieve this objective are set out below.

Apprenticeships

9.3.7 Thames Water will seek to ensure contractors employ at least one apprentice for every 50 site employees at all times throughout construction contracts.[ix] Over the entire project, which it is estimated will generate approximately 19,000 man years of employment, it is estimated that between 250 and 400 apprentices will be trained.

9.3.8 These apprenticeships will help fulfil contractors' labour and skills requirements in a cost-effective way, while also providing paid employment, training and potential pathways into employment for apprentices.

9.3.9 Thames Water will work with key partners including the National Apprenticeship Service and Construction Skills to identify the most effective and appropriate apprenticeship schemes for implementing this activity.

TUCA

9.3.10 Crossrail was the major driver of TUCA and has shaped the wide-ranging curriculum which TUCA now delivers, which includes newly developed qualifications such as the Tunnelling Construction Passport. However TUCA was also conceived with the skills and training needs of future projects including the Thames Tideway Tunnel project in mind.

9.3.11 Thames Water are already working with Crossrail and aim to provide on-going partnership and support to TUCA in the future. This reflects the need to meet the skills requirements of Thames Tideway Tunnel project, including the potential gap around mining / underground workers identified in Section 6. However this activity will also help drive the evolution of UK the tunnelling and underground sector as a whole.

River transport related skills

9.3.12 Thames Tideway Tunnel project will use the river for moving excavated material and freight and needs a river transport workforce to deliver the transport strategy. Section 5 identified a clear gap in the availability of

[ix] This would mean, for example, on a contract package for 50 people over 3 years and assuming a minimum 12 month apprentice period, that at any one time there would be at least one apprentice on the site and at the end of the three years three apprentices would have been trained.

river-related transport skills, especially with regard to marine boatmasters who require detailed local knowledge and a Boatmaster Licence (BML) which takes at least two years to complete.

9.3.13 The project also represents a wider opportunity to promote the use of the river as a significant freight route.

9.3.14 Thames Water will therefore support the development of river-transport related skills. It will work with partners including the PLA and the TTA. Thames Water has already contributed towards the TTA's new training system which will qualify as an Apprenticeship under the Maritime Occupations Framework programme.

Monitor skills gaps and training requirements and establish a Skills Planning Group

9.3.15 Thames Water will set up mechanisms for the on-going monitoring of skills gaps and training requirements. Contractors will be required to forecast and report on their future employee requirements, as well as on staff turnover rates and conversion rates of apprenticeships into on-going employment. They will also be required to participate in a Skills Planning Group which, on the basis of this information and other intelligence, will identify future training requirements and potential employer interventions.

9.3.16 Crossrail and many other large construction projects have employed an in-house resource (a business analysis or other professional) to assist in modelling future employee needs, and the Thames Tideway Tunnel project's contractors could pursue the same approach.

9.3.17 The Skills Planning Group will be chaired by a senior leader from the Thames Tideway Tunnel project executive management team. It will involve among others representatives from Thames Tideway Tunnel project, the prime contractors and supply chain, FE colleges and training organisers (including TUCA and river transport bodies), and could also draw on other delivery and funding agencies such as Construction Skills and the Skills Funding Agency. These agencies and stakeholders already work together in well-established partnerships on the strategic planning of skills and training in London and can bring wide-ranging relevant experience and knowledge to the table.

9.3.18 The gap analysis carried out in Section 7 represents an initial conceptual framework for assessing future skills and labour requirements associated with the project. Once contractors are appointed and the Skills Planning Group is formed, this framework can be refined and the modelling exercise will be informed by more detailed 'real-time' information and diverse professional expertise.

9.3.19 Where a skills gap is identified, it may be appropriate for the Skills Planning Group to devise measures to address that gap. Potential interventions could range from sponsorship of degrees to direct contributions towards new FE courses or existing FE institutions. It may be appropriate to apply for grants from Construction Skills, BIS or other skills funding organisations.

9.3.20 The Skills Planning Group will therefore be of key importance for the delivery of Objective 2, and of the *SES* as a whole.

Links with Lee Tunnel and Crossrail

9.3.21 The Thames Tideway Tunnel team will work closely with Crossrail and ensure that there are strong links with the Lee Tunnel project in order to carefully manage the relationship between the contracts and workforces of these three projects. Based on their current programmes, there are clear opportunities to re-employ workers on the Thames Tideway Tunnel project as labour demand on Crossrail and the Lee Tunnel decreases.

9.3.22 This would benefit Thames Tideway Tunnel project contractors, who would secure the appropriate skilled workers in a timely and efficient way, as well as Crossrail and Lee Tunnel workers who would enjoy continuity of employment.

9.4 Objective 3: Promote opportunities for local people and disadvantaged groups

9.4.1 The project will generate economic opportunities in terms of jobs and contracts. Thames Water will seek to steer its activities, and those of its contractors, to maximise economic benefits for local, disadvantaged and under-represented people and companies.

9.4.2 The project will directly employ a large workforce and also generate additional indirect jobs. Thames Water will promote equitable pay and working conditions for the project's direct workforce. It will also pursue equity goals by promoting access for disadvantaged sections of the population, and to groups commonly excluded from or under-represented in the workforce. Such groups often need assistance to enter the labour market, for example because they have been unemployed for some time and also to sustain employment after they have been placed into a job. The benefits of bringing such groups back into the workforce are considerable, not just to the individual in question but to society more widely.

9.4.3 Thames Water will promote access to jobs generated by the project to local workers and where possible encourage spending at local businesses. While most of the jobs and contracts will be associated with the construction phase and therefore temporary in nature, there is the potential to permanently increase the capacity and skills level of the local workforce and supply chain with long term benefits for the local economy.

9.4.4 Small businesses account for a considerable proportion of employment in Greater London. As set out within para. 5.3.5, in the boroughs with project sites approximately 85% of businesses have between one and nine employees. Often small businesses find it difficult to access opportunities within the supply chains of major organisations. Thames Water will seek to ensure that small businesses benefit from contracts arising from the project.

9.4.5 As this objective particularly targets local people and businesses, it will be important to draw upon the knowledge and experience of existing local organisations and networks working in the field of job brokerage and economic development.

9.4.6 Activities to achieve this objective are set out below.

London Living Wage

9.4.7 Thames Water supports paying the Thames Tideway Tunnel project workforce at least the London Living Wage, subject to approval by Ofwat. Contractual requirements would be used to secure this commitment for workers who are not directly employed by Thames Water.

9.4.8 The Living Wage is an hourly rate set independently every year in London by the Greater London Authority (GLA). It is calculated according to cost of living and gives the minimum pay rate required for a worker to provide their family with the essentials of life. In London the rate (as of November 2012) is £8.55 per hour[16].

Targets for local employment

9.4.9 Contracts will include requirements to employ local workers. Specific targets will be included as follows:

a. at each key tunnel drive site (located in LB Hammersmith & Fulham, Wandsworth, Southwark and RB Greenwich), Thames Water will seek to ensure that at least 20% of employees live in the drive site borough and, overall, at least 25% of employees live in those boroughs where project worksites are located

b. for river transport, Thames Water will seek to ensure that at least 30% of employees live in Greater London, Kent or Essex.

9.4.10 These targets reflect Thames Water's aspiration that local communities derive economic benefits from the project, while also reflecting the nature of the relevant industrial sectors and Greater London's labour market. Workers commonly move across and come into Greater London to take up jobs, and some workers will likely move between proposed construction sites during the project.

Targets for employment of local people who are unemployed

9.4.11 Thames Water will set an appropriate and sustainable target for the employment of local unemployed people within the contractor workforce.

9.4.12 The target will reflect discussion with relevant partners, and will aim to balance the aspiration to reduce local unemployment with the other objectives and priorities set out in this strategy.

Targets for employment of ex-offenders

9.4.13 Thames Water will set a sustainable target for the employment of ex-offenders within the contractor workforce throughout the duration of construction contracts.

9.4.14 The aim of this activity is for ex-offenders to secure long-term employment (ie, to stay in a job for as long as possible). The project will utilise a brokerage group (or groups) such as Changing Paths[17] to assist contractors in selecting the most suitable candidates. Thames Water will engage with relevant stakeholders such as the London Probation Trust, the National Offender Management Service and the London Enterprise Panel to draw on best practice in assisting ex-offenders back into work and to link with similar initiatives.

Employment brokerage

9.4.15 Contractors will be required to employ a Skills and Employment Manager (SEM) at each key tunnel drive site. The SEM will be responsible for job-brokerage and outreach. He or she will work to maximise the number of contractor employees drawn from the target beneficiary groups including local residents, unemployed people, other disadvantaged groups including ex-offenders, and groups which are currently under-represented in the workforce (for example in terms of age, ethnicity, gender and disability).

9.4.16 Potentially relevant measures in this respect could include the early communication of employment opportunities to target groups, and preparation work with potential candidates, for example relating to pre-qualifications for employment such as CSCS training, or job-readiness.

9.4.17 The SEM would also provide expert advice on workforce training and skills. Embedded within the contractor's organisation at the project hub, the SEM would have a detailed understanding of the recruitment needs and working practices of the contractor and feed into the Skills Planning Group described above.

9.4.18 The SEM would provide single point of contact for matters relating to employment and skills and liaise with other job brokerage agencies and skills providers. Indeed, given the importance of local knowledge and networks to this role, it may be appropriate for the SEM to be drawn from the local authority or another existing local job brokerage agency.

A diversity policy

9.4.19 Contractors will be required to use reasonable endeavours to maximise the diversity of their workforce.

9.4.20 They will be required to report on how recruitment activities, training and development activities, working practices and the on-site environment have been designed to reflect this requirement.

9.4.21 The contractor's SEM will be responsible for ensuring that jobs are communicated to under-represented groups. The contractor will report on the demographic profile of applicants for new jobs for example in terms of age, ethnicity, gender and disability. Regular reporting will also be required on the profile of the contractors' workforce, with data to be collected through a voluntary survey.

9.4.22 To improve employment opportunities for disabled people, key tunnel drive site offices should be compliant with Disability and Discrimination Act (DDA) requirements, as a minimum in ground floor areas.

Supply chain diversity and engagement

9.4.23 Contractors will be required to use reasonable endeavours to ensure local businesses benefit from spending on goods and services during the project.

9.4.24 To increase opportunities for small businesses, Thames Water and main contractors will use the online procurement portal *CompeteFor* to advertise contracts. *CompeteFor* has a particular focus on opportunities in the supply chains of major organisations which are often not visible to smaller businesses. It is free, and facilitates access to business support.

9.4.25 Contractors will also be required to employ a Supply Chain Engagement Manager (SCEM) who will engage with local businesses in order to maximise opportunities arising from the project. Potential initiatives include 'meet-the-buyer' and other public information events; compilation of a database of interested local suppliers who can be informed early of upcoming opportunities; and work with businesses to ensure they are ready to respond to contracts (for example with regard to the various legal and administrative criteria of the tendering process). The SCEM will also work with other business support agencies and stakeholders such as Job Centre Plus, local authorities and the Chamber of Commerce.

9.4.26 Reporting will be required on contracts awarded so that Thames Water can monitor value of spending on local and small businesses.

Local opportunities and outreach group

9.4.27 A Local Opportunities and Outreach Group will be set up to lead the *SES* activities relating to each drive site and the local area and based at the Project Hubs. There will also be a Programme Management Team with responsibility for implementing the project-wide activities relating to community outreach and education.

9.4.28 The Group would be led by the Project Director for relevant Tier 1 contractor and include representatives from the project; Thames Water; local authorities; local FE / training institution representatives. The composition of the group reflects the need to draw upon the detailed knowledge and experience of existing local stakeholders including local authorities. The members of the Group will help design the activities and be directly involved in their delivery; for example, the SEM / SCEM could be drawn directly from the local authority or an alternative existing job brokerage agency.

9.5 Objective 4: Support initiatives to promote STEM education and careers

9.5.1 Thames Water will aim to promote science, technology, engineering, and mathematics (STEM) education, and to promote STEM careers and routes into relevant occupations.

9.5.2 The target beneficiaries of this objective are secondary school children, FE college students and other teenagers within the key tunnel drive site boroughs. Given the project's construction programme spans a number of

years, some of the beneficiaries could ultimately become part of the Thames Tideway Tunnel project workforce. However the key aim of this objective is to inform and inspire young people about STEM careers more generally, and to encourage them into areas of STEM education which have clear pathways into employment.

9.5.3 The rationale for this objective relates in part to the current poor take-up of STEM subjects within schools and colleges, and the aging profile of the UK's workforce of engineers[x]. This implies a potential shortage of the technical and professional skills required to deliver Thames Tideway Tunnel project and other large infrastructure projects in the future. More broadly, however, Section 5 highlights that there are high proportions of 16-18 year olds NEET in the boroughs through which the main tunnel passes. This objective aims to increase aspirations among young people, and to increase their awareness of and support them into well-defined and attractive career paths, so they are not vulnerable to becoming unemployed or to falling out of education in due course.

9.5.4 In this way Thames Water will build on its previous Education and Community Investment Programme in order to help develop a future workforce who can make London and the UK a world leader in the delivery of large infrastructure projects.

9.5.5 Activities to achieve this objective are set out below.

STEM education in secondary schools and colleges

9.5.6 Thames Water will promote STEM subjects and work based learning in secondary schools and FE colleges in drive site boroughs in order to raise young peoples' interest in STEM subjects and career paths. The initiatives put in place to take forward this activity will be designed based on engagement with local schools in the early years of the project programme. Thames Water has already established relationships with schools in the key tunnel drive site boroughs through its Education and Community Investment programme, which has delivered a series of projects.

9.5.7 Thames Water will further develop the TunnelWorks online learning resources for Key Stage 3 and 4 and post-16 age groups, which launched in September 2012. TunnelWorks resources are CREST accredited and curriculum based, and were informed by focus groups undertaken with schools local to the drive sites.

9.5.8 The Thames Tideway Tunnel project's STEM ambassador programme will be continued during the construction phase. This programme involves Thames Tideway Tunnel project staff volunteers spending up to 3 days per academic year in schools, giving talks or interactive workshops on STEM subjects. To date the programme has been delivered to students in Key states 3, 4 and at post-16 settings and has been a valuable exercise

[x] For example, a report for the Royal Academy for Engineering (2012) found that demand for STEM skills will exceed supply in the foreseeable future, and Engineering UK (2010) found that half of those currently employed in engineering professions are over 45.

in terms of the continuing professional development of the project staff as well as for the student beneficiaries.

9.5.9 The 'project hubs' at the key tunnel drive sites, described at para. 9.2.16 could provide space and resources to deliver STEM education initiatives. It may also be possible for children to take part in visits to the project sites in order to experience a major engineering project first hand and to learn about the occupations of on-site workers. Such school visits have taken place at the Lee Tunnel site in Beckon and have proved high exciting and inspiring for the children taking part.

9.5.10 These activities will be driven by the Local Opportunities and Outreach Group described in para. 9.4.27 and Section 11.

STEM education outside of established educational settings

9.5.11 Thames Water will also explore opportunities to promote STEM education for teenagers who are not attending school.

9.5.12 Children outside of established educational settings are likely to obtain fewer skills and qualifications than those attending school, and to be provided with less information about pathways from education into work. They are therefore at higher risk of become workless. Educating these young people about STEM and related careers therefore has clear links with Thames Waters' aims around reducing barriers to the labour market for vulnerable groups (see Objective 3).

9.5.13 This activity will involve engagement with relevant agencies such as the Skills Funding Agency, local authorities' children's services departments and youth offending teams, and the Youth Justice Board as well as third sector organisations. Thames Water will aim to draw on the expertise of these stakeholders to formulate relevant initiatives.

Work with partners to promote engineering careers

9.5.14 There are many organisations who work to promote engineering careers, both directly for example by funding and delivering education and skills programmes, and indirectly for example through lobbying and marketing activities. Relevant organisations include Engineering UK, the Institute of Chartered Engineers (ICE) education, Sector Skills Councils and higher education institutions in London specialising in engineering.

9.5.15 Thames Water will explore opportunities to work with such organisations, identifying areas where it can support and augment their activities and therefore more effectively promote engineering careers.

9.5.16 Initiatives could include jointly-held events, the production of online information and resources, and financial contributions or in-kind support in the design and delivery of training programmes.

9.5.17 Thames Water will also facilitate the involvement of the Thames Tideway Tunnel project's industry experts with schools and institutions promoting engineering careers. Where opportunities exist, experts working within the project could share their experience with organisations to provide figure-heads for the industry and to inspire the next generation of engineers.

9.6 Relationship between the objectives and activities

9.6.1 There is some overlap between the objectives and activities in terms of their rationale and their target beneficiaries. For example, training programmes aiming to fulfil Objective 2 could be taken up by young and unemployed people who are also intended beneficiaries of Objective 3.

9.6.2 Plate 9.6.1 describes and compares the degree of focus on different beneficiaries, ie, the project workforce, the wider (non-Thames Tideway Tunnel) workforce and the local community. It illustrates that:

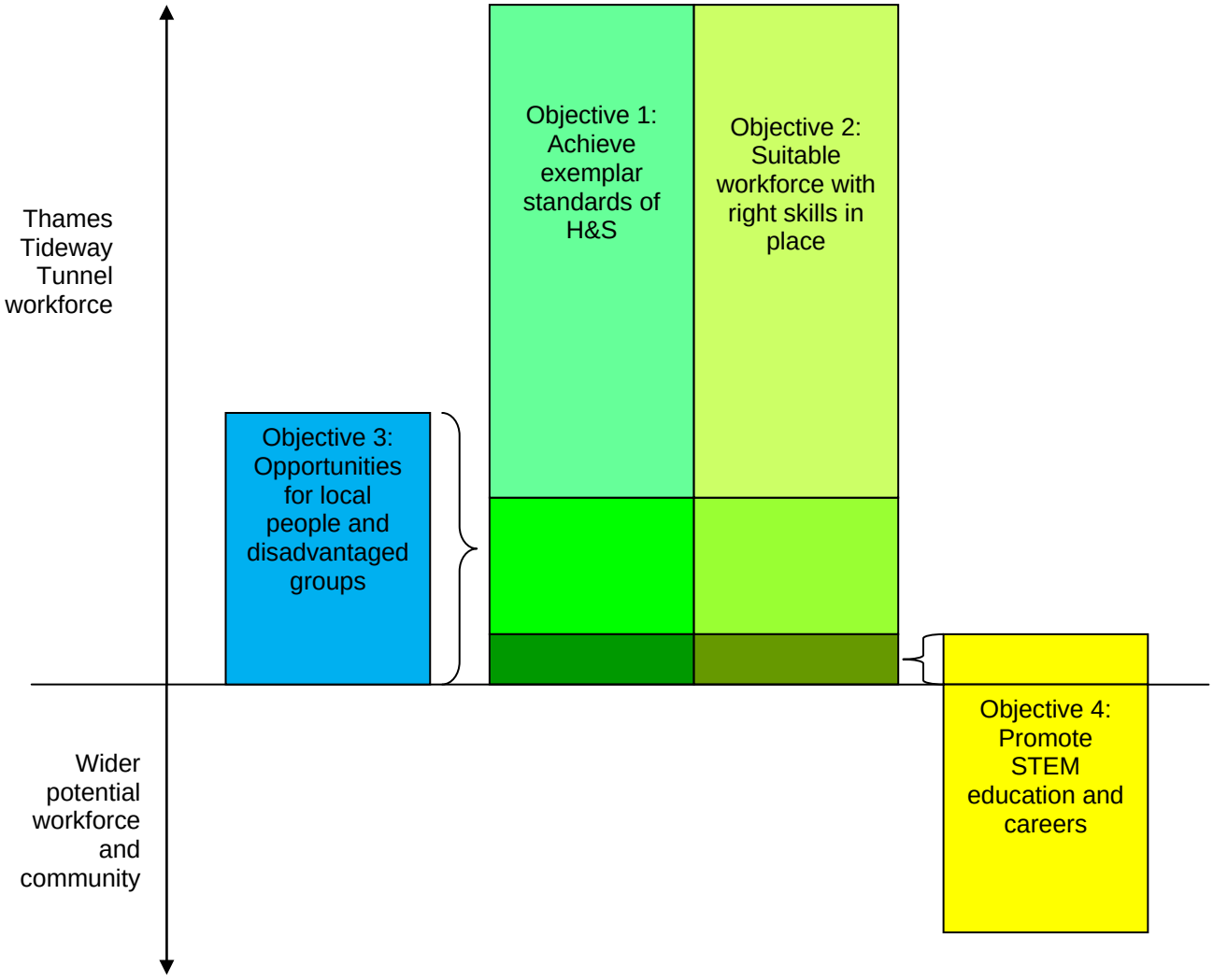
a. Objectives 1 and 2 relate solely to the project workforce - specifically, to their skills and well-being and their subsequent ability to effectively and safety deliver the project.

b. Objective 3, and to a lesser extent Objective 4, focus on generating benefits for the wider community and workforce.

c. Objective 3 and Objective 4 overlap with Objectives 1 and 2 in that, while they would not necessarily have any direct consequences for the Thames Tideway Tunnel project workforce and the delivery of the proposed development, they aim to draw in workers from the wider workforce.

9.6.3 There is also an overlap in terms of the activities and resources which would be required to achieve the objectives, as explored in the following sections of the *SES*.

Plate 9.6.1 Overlap of Skills and Employment Strategy objectives and beneficiaries



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10 Monitoring performance

10.1 Aims

10.1.1 This section describes the measurable outcomes and outputs of the strategy. It describes the rationale and potential methods for developing a performance measurement system.

10.1.2 It is important that the high level objectives and the specific activities to achieve these objectives identified in section can be effectively monitored and measured. This will allow lessons to be learnt to help guide the project both during and after the Thames Tideway Tunnel project is completed.

10.2 Outputs

10.2.1 Outputs can be defined as the tangible results of implementing the specific activities. For example, the Objective 3 activity where we seek to ensure that at least 30% of river transport employees should live in Greater London, Kent or Essex can be measured and monitored during the project as a means of defining whether the overall objective is being achieved.

10.2.2 Monitoring of outputs is essential to determine, on an on-going basis, whether the strategic objectives are achieving their target outputs and subsequently, whether the overall outcomes and vision could be realised.

10.3 Outcomes

10.3.1 Outcomes are less tangible and often longer term results of implementing the strategy. They include changes in the local community, environment or workforce that the activities ultimately aim to achieve. For example, the outcome of Objective 3 might be an overall increase in the numbers of people working in the river employment sector in the local area.

10.3.2 Outcomes are generally measured and documented through evaluations undertaken at various intervals during or following project completion.

10.4 Methods for effective performance monitoring

10.4.1 There are particular methods and lessons that can be followed to achieve effective performance monitoring. These include the following:

a. develop SMART performance indicators ie, specific, measurable, attainable, realistic and timely

b. fewer but better quality and appropriate performance indicators

c. performance monitoring mechanisms should be consistent with the stated aims of the strategy and individual actions

d. performance indicators should be flexible and readily updateable

e. the practicality of how data will be collected should be scoped out before defining measurable indicators eg, employee surveys, ONS data, sub-contractor questionnaires.

10.5 Methods for effective evaluation

10.5.1 The primary purpose of evaluation is to gain an insight into the proposed strategy and activities, to enable reflection on that strategy and activities and to use that insight to assist in the identification of future change. The method of evaluation should be tailored to the specific outputs and outcomes once they are agreed.

10.5.2 Evaluation of the outcomes can be performed either on an interim and final basis or just at the end of the project. The evaluation can be conducted either internally or externally.

10.5.3 The key questions the evaluation will seek to ask include the following:

a. what has been achieved?

b. have the specific outcomes been realised?

c. what would have happened anyway?

d. was it value for money?

e. what lessons can be taken into other projects?

f. how will the lessons be communicated to the wider public as the *SES* is a positive story to tell?

10.6 Suggested measurable outputs and outcomes

10.6.1 The suggested outputs and outcomes linked to the objectives described in Section 9 are shown in Table 10.6.1 below. The outputs and outcomes are indicative and set out at a broad level at this stage. For successful monitoring and evaluation it will be necessary to further refine these outputs and project outcomes as the project progresses.

Table 10.6.1 Suggested measurable outputs and outcomes

Objective	Suggested outputs	Suggested outcomes
O1 – Achieve exemplar standards of health, safety and well-being	Number employees completing H&S training Number incidents / near misses reported Number employees holding smart card	Incident rate on project is zero major injuries / RIDOR incidents Accident Frequency Rate of 0.1 or better
O2 – Ensure a suitable workforce with the right skills is available to deliver the project	Number apprenticeships funded / taken-up Number students graduating from TUCA pa Number gaining river transport skills / qualifications	Successful delivery of Thames Tideway Tunnel project with the right skills and workforce Reduction in number people with no qualifications
O3 – Promote opportunities for local people and disadvantaged groups	Number people employed by project who are: Local Ex-offenders Average earnings of project employees Number employees who are happy with working environment / culture (employee survey) Number / value of contracts secured by local businesses	Change in average weekly income Increase in employment rate in local areas, or target groups.
O4 – Support initiative to promote STEM education and careers	Number schools engaged Number interventions / events delivered (to be defined) Number pupils participating Increased awareness of careers – pupil survey	GCSE attainment in participating schools Take up of STEM subjects at FE

10.7 Summary

10.7.1 The four objectives described in Section 9 are the skills and employment priorities which are most effective for Thames Water to pursue. They articulate the high level goals of the *SES*, and feed directly into a series of *SES* activities. It is important to be able to measure and evaluate, on an on-going, interim and final basis, whether these activities are helping to achieve the objectives. This will guide the development of the project to maximise the benefits as it is designed and built. It will also enable continuous improvement and enable lessons to be learnt to take forward into other projects.

10.7.2 This will involve the development of an effective performance management system. The starting point of this is a set of outputs and outcomes. These should be specific, measurable, achievable, realistic and timely. The outputs are more tangible deliverables that can be monitored and measured throughout the project. The outcomes are the less tangible effects that the project intends to achieve. The success in achieving these outcomes can be evaluated in the middle or end of the project, or both.

11 Delivery

11.1 Introduction

11.1.1 Thames Water understands the importance of putting clear and comprehensive arrangements in place for delivering the *SES*.

11.1.2 While the details of the delivery arrangements described will need to be developed and confirmed in due course, this section sets out where key responsibilities for leadership and delivery will lie, and actions required in the years up to project commencement.

11.2 Organisational arrangements

11.2.1 Plate 11.2.1 sets out an indicative organisational structure for the delivery of the *SES*.

11.2.2 For each element of the *SES*, a team with a clearly identified lead will drive forward delivery. At all levels, it is envisaged that a variety of stakeholders, including Thames Water, the Thames Tideway Tunnel project, contractors and external parties will be involved. This emphasises the importance which Thames Water places on joint working for effective delivery.

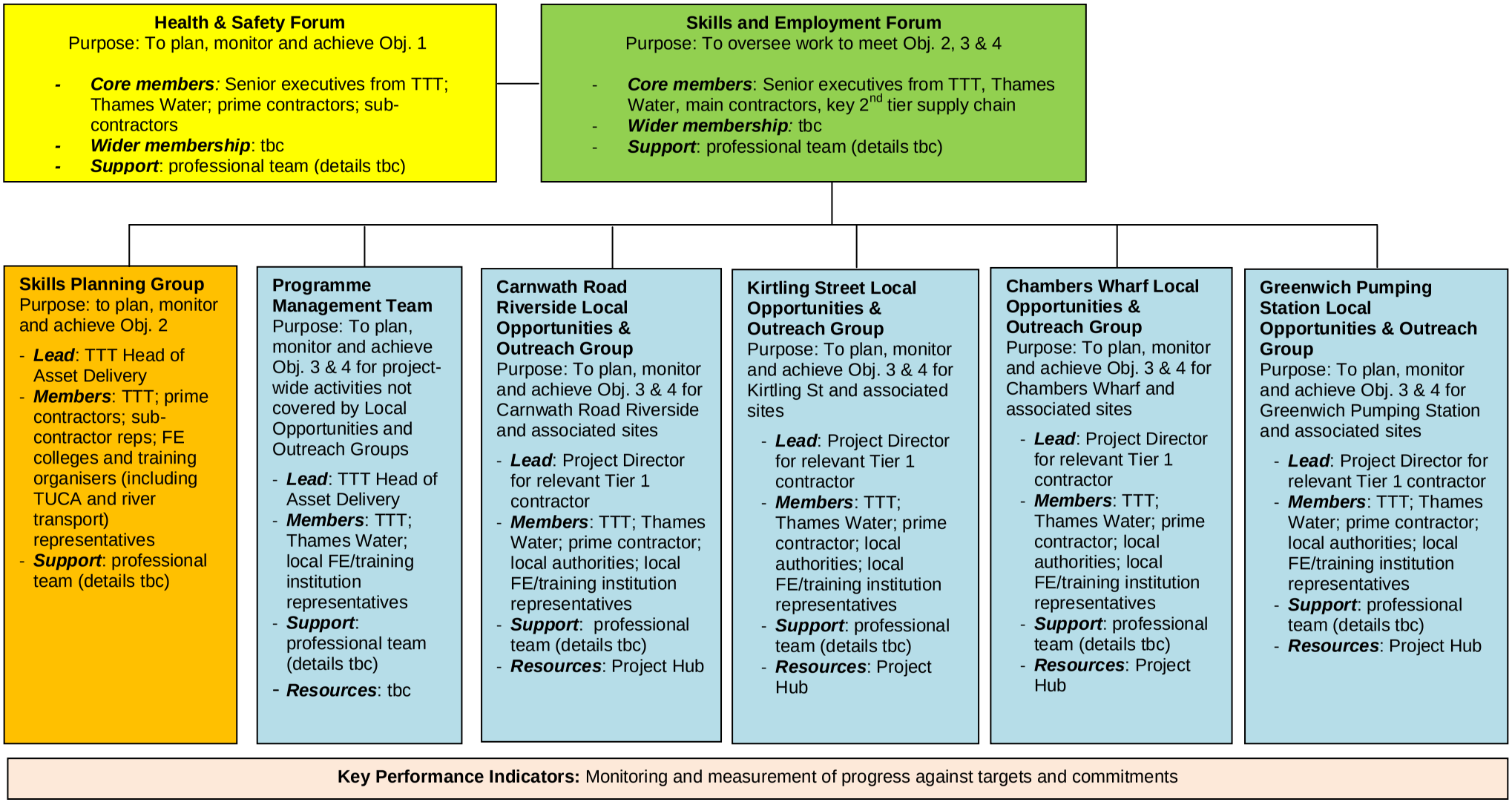
11.2.3 A Skills and Employment Forum will lead the delivery of Objectives 2, 3 and 4, and take responsibility for the overall delivery of the *SES*. A H&S Forum will sit parallel to this and lead the delivery of Objective 1. The core membership of both fora will include senior executives from the project, and opportunities for the participation of other stakeholders will also be provided as part of a wider membership group.

11.2.4 A series of groups or teams will sit beneath and report to the Skills and Employment Forum.

a. Objective 2 will be delivered by a Skills Planning Group. Led by Thames Tideway Tunnel Head of Asset Delivery, this group will be fundamental to delivering the *SES*. It will draw together intelligence from across the project on skills and recruitment needs and formulate appropriate initiatives to meet those needs in a co-ordinated and effective way. The group will involve key stakeholders including Thames Water, contractors, local authorities and skills providers including FE colleges, TUCA and river transport bodies.

b. Objective 3 and 4 will be delivered by Local Opportunity and Outreach Groups. Established for each of the four key tunnel drive sites and led by the main contractor, these Groups will deliver locally specific initiatives promoting access and outreach, such as jobs brokerage, schools and community liaison and supply chain engagement. Membership will include local stakeholders including local authorities, reflecting the importance of experience and detailed knowledge in successful delivery of Objectives 3 and 4. A project-wide management team will support and co-ordinate delivery across the four key tunnel drive sites.

Plate 11.2.1 Indicative governance and delivery structure for the Skills and Employment Strategy



11.2.5 It is recognised that professional support and other resources such as space for training at the project hubs will be required, together with a robust framework for monitoring and feedback against targets.

11.3 Indicative programme

11.3.1 Plate 11.3.1 below, presents an indicative programme setting out the immediate next steps and other actions for implementation of the *SES* up to 2016. The assumed project milestones (shown in bold) illustrate how the *SES* fits with key project events.

Plate 11.3.1 Indicative programme for implementation of the SES

2013

- **DCO Submission, SES published – early 2013**
- **Appointment of apprentices in project team**
- SES requirements included and evaluated in ITT for contractors
- Membership of Thames Tideway Tunnel Employment & Skills Forum confirmed; establish Health and Safety Forum and Skills Planning Group
- Maintain and strengthen initiatives and links with schools & colleges, training bodies, TUCA and other stakeholders
- Long-term training initiatives underway eg Boatmaster Licence (BML) training
- Establish close working links with skills and employment representatives from training organisations and all 14 London Boroughs affected by the project

2014

- **Development Consent application determination**
- **Contractors appointed – SES requirements established in contracts**
- Medium-term training initiatives underway
- Monitoring of skills gaps and initial training underway
- Commence quarterly review cycle of SES implementation

2015

- Initial apprentices and ex-offenders selected
- Lead-in for participation of schools/colleges in early stage of construction activities
- Composition of project hubs confirmed; Local Opportunities and Outreach Groups established and relevant professionals appointed, eg, Skills and Employment Managers
- First Annual Review of SES

2016

- **Main construction commences**
- Initial apprentices and ex-offenders commence work
- Commence participation of schools/colleges
- Second Annual Review of SES

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Appendices

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Appendix A : Best practice review

A.1 Aims and approach

A.1.1 This section presents findings from a best practice review. The purpose of the best practice review is two-fold: to explore lessons for effective practice and to identify precedents which can be used as a benchmark. Best practice examples have been identified through consultations with Thames Tideway Tunnel project staff and key stakeholders (consultees are listed in Appendix B), professional experience and desk based research.

A.1.2 The best practice review draws on the following development projects and their associated strategies:

Table A.1 Best practice review

Project	Strategy
Crossrail	*Crossrail Skills and Employment Strategy*[18]
London 2012	*ODA Employment and Skills Strategy*[19] *LOCOG Skills and Employment Strategy*[20]
Hinkley Point C	*Economic Strategy*[21]
Lee Tunnel	Section 106 agreement[22] contains relevant information
Kings Cross Central Development Programme	Section 106 agreement[23] contains relevant information
Heathrow Terminal 5	*Heathrow Local Labour Strategy*[24]
Sellafield	*Sellafield Socio-economic Development Plan 2010-11*[25]
Various mixed use developments in London	*LDA Skills and Employment Strategy*[26]

A.1.3 The examples above were selected for the following reasons:

a. they are predominantly London / South East based and so the socio-economic context of the project location is similar (with the exception of Hinkley Point C and Sellafield)

b. each project had a written strategy, fundamentally aiming to deliver social returns from construction projects (with the exception that no formal written strategy was identified for Kings Cross or Lee Tunnel)

c. each strategy is associated with the delivery of a major infrastructure or mixed-use project with the exception of the *LDA Skills and*

Employment Strategy which was focussed around linking employment to a range of development projects in London

d. they all represented some mix of public and private sector funding and delivery partners.

A.1.4 Each of the above examples has been examined, drawing on desk based research and consultations to identify lessons for Thames Tideway Tunnel project and present key findings below.

A.2 Key findings

A growing requirement for social investment

A.2.1 In recent years, there has been growing emphasis on major projects being delivered in a socially responsible way, due to a variety of factors including regulatory and policy drivers. For example, the Environmental Impact Assessment Directive[27] requires all projects considered to have significant effects on the environment to consider the social and economic impacts. Local planning and economic policies also emphasise the benefits of ensuring local communities benefit from major projects (see Section 4).

A.2.2 This has given rise to a growing interest in maximising social returns of development projects, which is becoming more sophisticated with each new project. A more targeted and strategic approach to achieving this goal is being seen; with significant resources invested as demonstrated below.

Levels of social investment by project

A.2.3 Table A.2 shows total project costs and estimated social investment for each project. Using the available information, the ratio of money spent on social investment per £1m of total project cost was compared. There appears to be no direct correlation between the total project costs and social investment with a range of £115 to £10,000. This may reflect the varying stage of development of some projects (which may invest more yet) and also the different issues and priorities related to each project.

Table A.2 Relationship between project investment and skills and employment strategy investment

Project*	Strategy	Total project cost	Estimated social investment	Spend on SES per £1m of project** cost
Crossrail	*Skills and Employment Strategy*	£16bn	£5m	£312.5
London 2012	*ODA Employment and Skills Strategy*	£9.3bn	~	~

Project*	Strategy	Total project cost	Estimated social investment	Spend on SES per £1m of project** cost
	LOCOG Skills and Employment Strategy	£2bn	£20m	£10,000
Hinkley Point C	*Economic Strategy*	£10bn	£6m	£600
Lee Tunnel	*S106 agreement*	£900m	~	~
Kings Cross Central Development Programme	*Kings Cross Central Development Programme*	£2bn	~	~
Heathrow Terminal 5	*Heathrow Local Labour Strategy*	£13bn	£1.5m	£115.38
Sellafield	*Socio-economic Development Plan 2010-11*	£1.2bn	£3.1m	

**Excludes LDA SES as not linked to a specific development project*
***URS calculation 2012*

Setting a clear strategy

A.2.4 The Government through Treasury Green Book[28] sets out the policy making process and emphasises that there must be a clear and logical connection between the rationale for investment, the strategic objectives, the activities funded and end outputs and outcomes. This represents best practice and shows how activities funded through the strategy are likely to impact on intended objectives.

A.2.5 As set out above, many of the projects had a written formal strategy in place. A review of the written strategies showed that some projects (Crossrail, Sellafield, Hinkley Point C and London 2012) prepared a clear evidence base to provide a baseline of local issues and demonstrate a rationale for the strategy.

A.2.6 Each strategy aimed to address around five strategic themes (linked to the needs identified through the evidence base). The most common strategic themes related to job brokerage, workforce development and Small and Medium Enterprise (SME) support. Other themes have included building community relations, volunteering, H&S, and carbon reduction. Some strategies (Crossrail, Heathrow Terminal 5, and London 2012), encapsulate these themes and goals in a set of high level strategic objectives.

A.2.7 Others did not establish high level strategic objectives and this represents a challenge in communicating the purpose of the strategy to the public and stakeholders as well as performance management. Heathrow Terminal 5

and Crossrail both provided a clear example of how strategic objectives would be achieved through relevant activities.

A.2.8 Clear governance structures are also needed to ensure effective delivery of the strategy. Examples such as Crossrail and the ODA have a strategic lead (ie, a core delivery person or team) responsible for delivering the strategy.

Setting commitments and targets

A.2.9 Setting targets is a useful way to ensure a clear and directed focus for the strategy as well as a way to measure performance and success. Some of the strategies reviewed have set definitive targets. Others have not set targets or committed to achieving certain outcomes.

A.2.10 Whilst there are benefits to setting targets, caution should be used when assessing performance against targets, in case targets were not appropriate or viable in the first place. Another issue is 'hitting the target and missing the point'.

A.2.11 Taking into account the strategies reviewed and wider examples, there are examples of both voluntary and contractual commitment to local procurement and local employment targets eg, Stirling Council set contractors a target of 25% of jobs filled by local employees. Research from elsewhere suggests it is difficult to compare effectiveness of voluntary versus contractual commitments from contractors due to a variety of factors.[29]

A.2.12 There are also limitations when imposing targets on contractors. Most projects in the best practice review have used the term 'best endeavours' or reasonable endeavours. For example, Tower Hamlets asks any successful contractor to use their best endeavours to ensure that at least 20% of the construction and related works should be undertaken by local residents[30]. In conclusion, any targets should be carefully considered and must be appropriate to the context of strategy.

Activities funded through strategies

A.2.13 As noted above, each project funded a range of different activities to achieve the aims of their social investment strategies. The types of activities delivered have included:

a. apprenticeships and volunteering opportunities
b. raising awareness and interest in STEM subjects
c. raising awareness of careers opportunities
d. community based activities and investment in local facilities
e. job brokerage interventions
f. in the case of Heathrow, compensation schemes were included in the strategy
g. business support and advice together with procurement portals
h. the best practice review identified three common approaches to delivering activities:

i through initiatives of contractors, eg, BeOnsite originally established by Lend Lease and Changing Paths, originally established by Wates.

ii by the project developer themselves, eg, some projects have employed an in house workplace co-ordinator, eg, Kings Cross Central development Programme and Heathrow Terminal 5.

iii by drawing in or funding existing projects, eg, East London Business Alliance (worked with Thames Water on Lee Tunnel), TUCA (funded by Cross Rail) and Supply London (used for both Crossrail and London 2012) and Education Business Partnerships.

A.2.14 The review did not suggest that any of these three approaches were preferable or more effective. However, experience from elsewhere suggests that there are potential efficiencies to be achieved by building on existing activities and local networks. These existing activities and agencies are already well established, have direct access to identified target groups, hold a proven track record of success, often hold effective strategic relationships with other organisations and as a result could offer efficiencies and costs savings in achieving the objectives of the *SES*.

A.2.15 This best practice review identified a range of London based organisations, largely not for profit, which exist to achieve similar objectives that Thames Tideway Tunnel project will be aiming to deliver. These are related to, for example, job brokerage, careers awareness, procurement and SME development and those organisations who are already engaged with target beneficiaries. (The review acknowledges that Thames Tideway Tunnel project team has already established relationships with some of these organisations).

Target beneficiaries

A.2.16 Some strategies aimed to reach particular groups within the local labour market, for example, young people, women, black and minority ethnic groups, long term unemployed and ex-offenders. The key reasons for this are achieving equity and promoting community cohesion by ensuring that the most vulnerable members of society are able to access opportunities.

A.2.17 Target beneficiaries should be identified early on so that effective mechanisms are in place to engage the target groups who are often hard to reach. Mechanisms include engaging relevant partners such as local authorities, other local networks and agencies, Job Centre Plus or the Probation Service; ensuring effective referral mechanisms are in place (both to and from the activity); ensuring there are sufficient numbers of people in the target groups to enable the objective to be achieved; and also recognising that there are different cost implications for targeting certain groups depending on the barriers to employment that certain groups may face.

A.2.18 The LDA *SES* estimated the cost to support a beneficiary into employment and sustain it for at least six months across a variety of London development schemes showed the following profile:

Table A.3 Cost to secure and sustain a job in London

Beneficiary type	Cost to access and sustain a job for 6 months
Older workers	£3,000 - £4,000
Lone parents	£3,500 - £4,000
Health problems and disability	£3,000 - £5,000
Young people (including NEETs)	£4,000 - £5,000
Ex- offenders	£6,000 - £9,000

Source: Evaluation of LDA SES (2011)

A.2.19 As noted above, referral routes are important both to the activities and progression routes from the activities.

Performance management and evaluation framework

A.2.20 There have in the past been efforts to generate economic benefits for local communities through construction projects although monitoring and evaluation evidence has been limited. This has made it difficult to understand the extent to which this goal has historically been achieved. There is a growing trend for more effective performance monitoring.

A.2.21 Many projects have not put clear performance monitoring and evaluation frameworks in place. Exceptions include the LDA *SES*, which was supported by a clear monitoring and evaluation framework, in line with wider LDA policies. The Heathrow example demonstrated clear successes against each of its objectives in their annual corporate report.

A.2.22 Failure to establish monitoring and evaluation frameworks represents a missed opportunity to maximise effectiveness of the project and to promote the successes of the project to wider partners and stakeholders.

Assessing value for money

A.2.23 Value for money should be assessed on the basis that the monies invested generate an efficient social return. That means the benefit is greater than the cost.

A.2.24 The Treasury Green Book and other government guidance[31] advocate the use of 'cost per net output' to assess the economic efficiency or value for money (VfM) of publicly funded projects. The most commonly used indicators are cost per job assist, cost per business assist and cost per skills assist.

A.2.25 Whilst there are limitations with this approach, it proves a useful tool to compare performance of a variety of projects to assess value for money[xi]. A national evaluation of Regional Development Agency (RDA) spend undertaken by PwC consultants estimated an average cost per net output drawing on evaluations RDA funded initiatives (see Table A.4 below).

[xi] The main limitation of this approach is that it focuses on economic returns on investment than social returns.

This showed that skills-related initiatives tended to be significantly less expensive to achieve than those to support businesses and people into employment.

Table A.4 Cost per net output

Output type	Cost per net output
Skills assist	£1,960
Business assist	£9,705
Job assist	£14,221

Source: PwC Impact of RDA Spending (2009)

A.2.26 So far 'benefit' has been defined as economic outcomes such as employment, training, skills or business opportunities. However, social benefits should also be included and organisational returns should be taken into account.

A.2.27 For example, the Sellafield Visitor Centre generated a positive image and supported positive community relations for Sellafield as well as providing benefits to the local community, but perhaps did not generate significant economic returns in terms of employment.

A.2.28 When assessing VfM, the defined benefit or value should be clearly linked to the objectives of the strategy.

A.3 Summary

A.3.1 The best practice review reveals the following lessons:

a. a clear evidence base and rationale for the strategy is important
b. this should be used to determine strategic objectives
c. intended beneficiaries should be identified early on with clear referral and progression routes identified
d. activities funded must be relevant to the strategic objectives
e. it is prudent to build on existing projects and partners (especially local agencies and networks) where a track record of success exists
f. there should also be clear targets where appropriate
g. there should be a clear performance management and evaluation framework to measure performance against targets and objectives
h. based on wider experience, activities related to skills and employment have tended to be more cost effective than activities related to SMEs (based on achievements of RDA funded projects).

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Appendix B: List of consultees

B.1 List of consultees

B.1.1 The following organisations were consulted to inform the findings of the study:

Table B.1 Consultees

Organisation and Department / Role of Consultee
LB Ealing, Economic Development Department
LB Wandsworth, Economic Development Department
RB Kensington and Chelsea, Planning Department and Economic Development Department
City of Westminster, Economic Development Department
LB of Lambeth, Regeneration and Environment
City of London, Economic Development Office
LB of Southwark, Economic Development Department
RB of Greenwich, Planning Department*
LB Newham, Access to Jobs Team
LB of Hounslow, Economic Development Department*
LB Richmond Upon Thames Economic Development Department
Crossrail, Employability and Brokerage Manager
Association of Colleges, Construction Lead / Hackney Community College
Tunnelling and Underground Construction Academy (TUCA) / ConstructionSkills Head of Vocational Services
British Tunnelling Society
CITB ConstructionSkills, Delivery Manager
East London Business Alliance

Organisation and Department / Role of Consultee
Cross River Partnership
Port of London Authority

**No response received*

Appendix C: Local development frameworks

C.1.1 The local planning policies for the boroughs which the main tunnel passes though are outlined in LDFs, and provide useful contextual information which is relevant to the *SES*.

London Borough of Ealing

C.1.2 LB of Ealing '*Adopted Development (or Core) Strategy*' was adopted in 2012. The following policy is relevant to employment, skills and training:

a. Policy 1.2(d) 'Delivery of the Vision for Ealing 2026'.

London Borough of Hounslow

C.1.3 The LB of Hounslow '*Preferred Core Strategy'* was released in July 2011 before submission of the *Core Strategy* to the Secretary of State in July 2012. The *Preferred Core Strategy* contains the following relevant policies:

a. E1 'Promoting Hounslow as a place to 'do business''.

b. E6 'Improving Job Opportunities and Accessibility'.

C.1.4 The LB of Hounslow *Employment Development Plan* was adopted in 2008. It supersedes the 2003 *Unitary Development Plan* (UDP) Employment Chapter and will be part of the LB Local Development Framework (LDF). It contains the following relevant policies:

a. E3 'Local Employment Opportunities'.

London Borough of Hammersmith and Fulham

C.1.5 The LB of Hammersmith and Fulham '*Core Strategy'* was adopted in 2011 and contains the following relevant policy:

a. Borough Wide Strategic Policy LE1 'Local Economy and Employment'.

London Borough of Richmond upon Thames

C.1.6 The LB of Richmond upon Thames '*Core Strategy'* was adopted in 2009 and contains the following relevant policies:

a. Policy CP13 (A) 'Opportunities for All'

b. Policy CP18 (A, C and D) 'Education and Training'

c. Policy CP19 (E) 'Local Business'.

London Borough of Wandsworth

C.1.7 The LB of Wandsworth '*Core Strategy'* was adopted in 2009 and contains the following relevant policy:

a. Core Policies for Issues: Policy IS 6 (A and D) 'Community services and the provision of infrastructure'.

Royal Borough of Kensington and Chelsea

C.1.8 The RB of Kensington and Chelsea *'Core Strategy'* was adopted in 2010 and contains the following relevant policy:

a. 'Corporate and Partner Actions for Fostering Vitality' (6, 7, 8 and 9).

London Borough of Lambeth

C.1.9 The LB of Lambeth '*Core Strategy*' was adopted in 2010 and contains the following relevant policy:

a. Policy S3 (g) – 'Economic Development'.

Westminster City Council

C.1.10 The City of Westminster '*Core Strategy*' was adopted in 2011 and contains the following relevant policy:

a. Policy CS45 'Thames Tunnel'.

City of London Corporation

C.1.11 The City of London '*Core Strategy*' was adopted in 2011 and contains the following relevant policy:

a. Policy CS22 (1ii, 4i, 4ii) 'Social Infrastructure and Opportunities'.

London Borough of Southwark

C.1.12 The LB of Southwark '*Core Strategy*' was adopted in 2011 and contains the following relevant policy:

a. Strategic Policy 1 (SO1A, SO1B) 'Sustainable development'.

C.1.13 The LB of Southwark '*Unitary Development Plan'* comprises saved policies which have not been superseded by the adoption of the *Core Strategy* and contains the following relevant policy:

a. Policy 1.1 (i) 'Access to Employment Opportunities'.

London Borough of Tower Hamlets

C.1.14 The LB of Tower Hamlets '*Core Strategy*' was adopted in 2010 and contains the following relevant policy:

a. Strategic Policy 07 (4a, 5b, 5c, 5d) 'Improving education and skills'.

C.1.15 The LB of Tower Hamlets '*Unitary Development Plan'* comprises saved policies which have not been superseded by the adoption of the *Core Strategy*. The following saved policy is relevant:

a. EMP 6 'Access to Employment'.

London Borough of Lewisham

C.1.16 The LB of Lewisham '*Core Strategy*' was adopted in 2011 and contains the following relevant policy:

a. *Core Strategy* Policy 20 (1c) 'Delivering educational achievements, healthcare provision and promoting healthy lifestyles'.

Royal Borough of Greenwich

C.1.17 The RB of Greenwich '*Draft Core Strategy*' underwent public consultation in 2011. Although not fully adopted, it is relevant for consideration and contains the following policies:

a. Policy EA1 'Economic Development'

b. Policy EA (d) 'Skills and Training'.

C.1.18 The RB of Greenwich '*Unitary Development Plan*' comprises saved policies which will remain in place until the *Core Strategy* is fully adopted. The following saved policy is relevant:

a. J14 'Training and Business Support'

London Borough of Newham

C.1.19 The LB of Newham '*Core Strategy*' was adopted in 2012 and contains the following relevant policies:

a. Policy J1(4) 'Investment in the New Economy'

b. Policy J3 (1,3) 'Skills and Access to Employment'.

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Appendix D: Job sector assessment

D.1 Tunnelling sector

D.1.1 Baseline information on the tunnelling sector is sourced from publicly available literature and consultation with the BTS. A key piece of literature is the Capability Analysis of the UK Tunnelling sector produced in April 2012 by the Department for Business Innovation and Skills (BIS)[32]. This report aims to assess whether there is sufficient capacity to meet demand generated by numerous large tunnelling infrastructure projects such as the project, Crossrail, High Speed 2, and the Northern Line Extension.

D.1.2 The National Infrastructure Plan (NIP) 2011[33] sets out the strategy for meeting the infrastructure needs of the UK economy and outlines a clear pipeline of over 500 infrastructure projects and programmes, of which 40 have been classified as 'priority projects'. This commitment to infrastructure programmes signals the potential for growth within the tunnelling sector in the future.

D.1.3 A number of the projects and programmes outlined within the NIP 2011 contain significant elements of tunnelling, including:

a. High Speed 2 (Tunnel Boring Machine (TBM) drives);

b. Crossrail (TBM drives, plus sprayed concrete linings);

c. Thames Tideway Tunnel project (TBM drives);

d. Northern Line Extension to Battersea (TBM drives);

e. London Underground capital programme (containing significant amounts of sprayed concrete linings on projects such as Tottenham Court Road and Bank Station);

f. National Grid cable tunnels (as part of the electricity and gas transmission and distribution investment programme) from Hackney to Willesden Green and Kensal Green to Wimbledon; and

g. New nuclear programme (eg, EDF's Hinkley Point C projects require TBM drives for new tunnels for cooling water intake and outflow).

D.1.4 Investment in infrastructure projects requiring tunnelling is expected to generate significant levels of employment within the tunnelling sector. At its peak Crossrail is anticipated to generate the demand for 14,000 employees, of which approximately 3000 jobs will be within tunnelling and underground construction trades.

D.2 Freight by water sector

D.2.1 Baseline information on the freight by water sector is sourced from literature and consultation with the Thames Tideway Tunnel delivery team and Company of Watermen and Lightermen. Over the last decade the UK freight by water sector has seen a decline in the amount of good lifted by waterborne transport, particularly within inland waters. Inland water traffic

declined by 21% in terms of goods lifted and goods moved over the last decade compared to a decline of 7% in terms of goods lifted across all waterborne transport[34]. One of the major barriers to the development of inland freight traffic has been identified as the loss of key wharves along the river network to higher value land uses such as residential. However, the GLA Safeguarded Wharves policy, which is currently being updated, seeks to retain a sufficient capacity of wharves on the tidal section of the River Thames[35]. The 2012 GLA Safeguarded Wharves evidence base projects that in total freight on the river Thames could increase from 8.8m tonnes in 2011 to approximately 10.6m tonnes per annum by 2021. This represents a 20% increase from the current volumes although it should be noted that this includes assumptions on material transported for the Thames Tideway Tunnel project[36].

D.2.2 The Thames is currently the busiest inland waterway within the UK, accounting for nearly 60% of all goods lifted on the UK's inland waterway network[37]. In 2010 more than two million tonnes of freight were transported on the Thames, an increase of 13% on 2009 levels. Projects such as Crossrail have been driving this growth within London and current proposals will see the transportation of at least 11 million tonnes of excavated material from the tunnelling stages of the project out of London by river as well as the transportation of equipment and materials throughout the project duration.

D.3 Construction sector

D.3.1 The construction sector within the UK can be separated into three main sub-sectors:

a. Commercial, industrial and social;

b. Residential, including repair and maintenance; and

c. Infrastructure, including repair and maintenance.

D.3.2 According to the ONS, the value of the construction output in the UK in 2011 was around £122 billion[38]. Construction output within Greater London rose by 13% to £20.7 billion in 2010, and is anticipated to increase at an average rate of 2.5% to 2016. Forecast growth within Greater London is expected to be driven primarily by the infrastructure sector, and the allocation of major projects such as Crossrail, Thames Tideway Tunnel project, Thameslink, Olympic Legacy projects and various station upgrade programmes.

Appendix E: Major projects assessment

E.1 Crossrail

E.1.1 Crossrail is a 74 mile railway project for London and the South East. It will connect the City, Canary Wharf, the West End and Heathrow Airport to commuter areas east and west of the capital. Crossrail will provide easier, quicker and more direct travel opportunities across the capital via new lines and tunnels[39].

E.1.2 The Crossrail construction period is expected to run from 2010 to 2017. Up to 14,000 people are likely to be working on the construction of Crossrail at its peak, with approximately 1,000 net additional jobs being created to operate and maintain the railway once it is completed. Further jobs will be secured in supplying the project during construction and providing services to those directly employed by Crossrail[40].

E.1.3 A key element of the Crossrail *Skills and Employment Strategy* is the establishment of the Tunnelling and Construction Skills Academy (TUCA) offering training opportunities for new entrants or those wishing to re-skill or up skill[41].

E.1.4 In summary, Crossrail will provide employment opportunities to the local population and training opportunities in construction and tunnelling to provide job-ready candidates for contractors.

E.2 Northern Line Extension

E.2.1 London Underground's Northern Line (Charing Cross branch) will be extended south from Kennington to the Vauxhall Nine Elms Battersea Opportunity Area with a terminus station at Battersea Power Station. This project is promoted by Transport for London (TfL), the Greater London Authority (GLA), and the LB of Lambeth, Southwark and Wandsworth.

E.2.2 TfL is currently preparing a submission to the Secretary of State for Transport for permission to build and operate the extension. Planning, design and public consultation have been undertaken[42]. The NLE aims to support the regeneration and development planned for the Vauxhall Nine Elms Battersea Opportunity Area and up to 25,000 jobs could be created.

E.3 Olympics Legacy Communities Scheme

E.3.1 The Olympics Legacy Communities Scheme project aims to regenerate the Lea Valley and Stratford area and to build on the sustainable infrastructure the 2012 Olympic Games have established. The area presents a huge potential for growth and investment and the Olympic Legacy will offer a new range of jobs and homes in new and existing neighbourhoods in this part of East London. An important part of that legacy is economic regeneration to provide lasting skills and employment opportunities in the five host boroughs around the Olympic park[43] and

improve educational attainment and skills in the host boroughs[44]. Information on the Olympics Legacy is contained within the following documents.

a. *OPLC Legacy Communities Scheme (LCS) Employment Statement* (September 2011)

b. *GLA Olympic Legacy Supplementary Planning Guidance* (OLSPG) (July 2012)

E.3.2 The Olympics Legacy construction period is expected to run from 2013 to 2021. The OLSPG estimates in terms of job creation are 1,200 jobs in the Olympic Park area, 28,000 jobs in the Stratford sub-area, and 12,000 in the Southern Olympic Fringe sub area, 6,400 in the Wick and Fish Island sub-area and 4,400 in the Northern Olympic Fringe sub-area.

E.3.3 The key characteristics of the OPLC LCS Employment Statement are as follows:

a. An enterprise and supply chain pilot, working with the East London Business Alliance, will deliver a programme of work to prepare the foundations for the OPLC's longer-term approach to local supply chain development with its future developers, contractors and operators. This will allow the potential benefits for local SMEs, social enterprises and diverse businesses arising from the future development and operation of the Park to be maximised.

b. A job and apprenticeship brokerage model will support the OPLC delivery partners, contractors and tenants to utilise local recruitment agencies as well as to ensure local people have the right information and support to access job and apprenticeships on the LCS.

E.3.4 In summary, the Olympics Legacy will provide a range and variety of employment opportunities suitable to the profile of the existing and resident population and new education facilities of direct benefit to the local population.

E.4 High Speed 2 (HS2)

E.4.1 HS2 is a planned high-speed railway between London and the Midlands. The HS2 'Y' network will provide direct, high capacity, high speed links between London, Birmingham, Leeds and Manchester. Phase 1 will connect London to the West Midlands. Phase 2 will connect the West Midlands to Leeds and Manchester. Information on HS2 is contained within the following documents.

a. Review of the Government's *Strategy for a National High-Speed Railway Network* (January 2012)

b. Economic Case for HS2: Updated appraisal of transport user benefits and wider economic benefits (January 2012)

E.4.2 The HS2 construction period is expected to run from 2017 to 2025. For the first phase alone it is estimated that HS2 could support around 40,000 jobs in the areas served by HS2. The key skills and employment characteristics of the project are as follows:

a. Out of the 40,000 jobs created by the first phase of HS2, 9,000 jobs would be created during the construction period, 1,500 would be permanent operational jobs and over 30,000 jobs would be created in the regeneration and development areas associated with station developments, and there will be even more significant opportunities for jobs growth with the wider Y network[45]

b. Wider strategies on education and skills are needed to integrate a station successfully into the local and regional economy[46]

c. The Government's National Infrastructure Plan describes the importance of a predictable and transparent long-term pipeline of infrastructure projects. HS2 will form a key element of the National Infrastructure Plan pipeline of infrastructure projects, enabling the private sector to plan for the future and to invest in technology and skills. The UK-based supply chain should be in a position to benefit as far as possible from HS2 and the Government will seek to open a dialogue with potential UK-based suppliers to ensure that they are well-placed to bid competitively for future contracts[47].

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Appendix F: Workforce assessment

F.1 Workforce assessment

F.1.1 This appendix provides supplementary information on the characteristics of the labour force within the 13 boroughs where project worksites are located. This includes skills levels, economic activity rates, and occupation. There is no data for the City of London due to its small residential population.

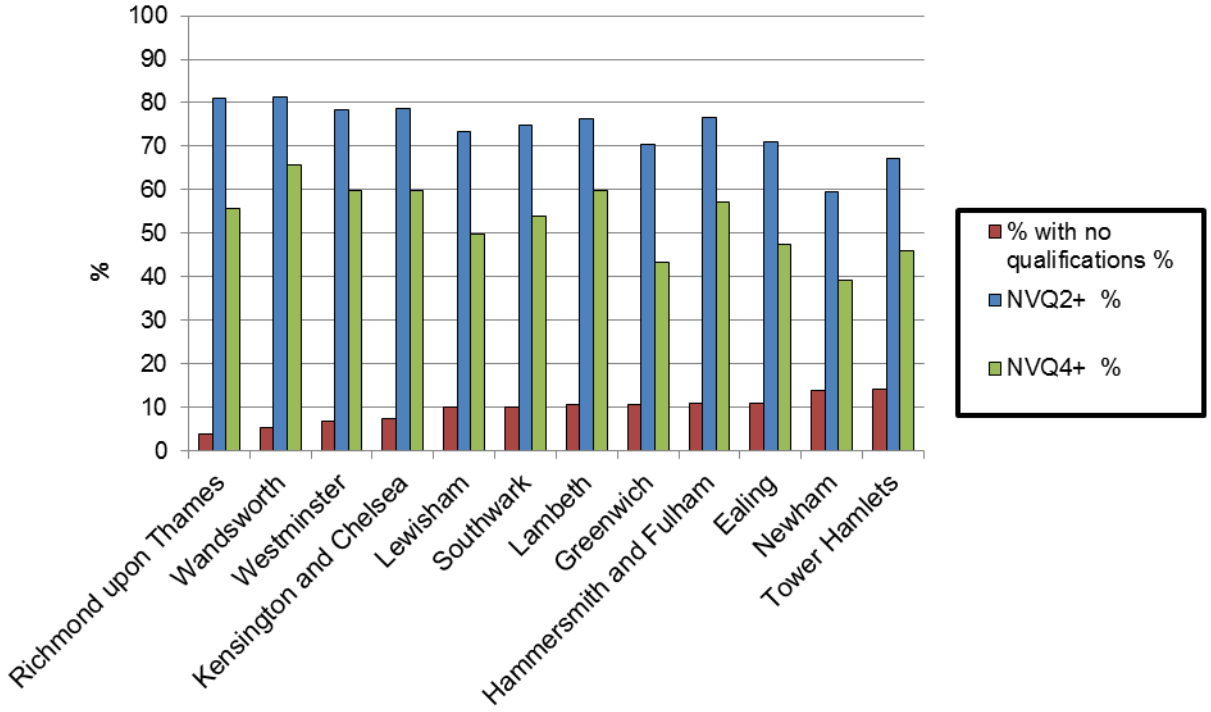
F.1.2 As shown in Plate F.1 below, 9.3% of Greater London residents have no qualifications, slightly less across Great Britain as a whole (10.6%). 71.4% of residents have qualifications equating to NVQ2 or higher, slightly more than within Great Britain as a whole (69.7%). A considerably greater proportion of Greater London residents have qualifications equating to NVQ4 or higher (45.9%) than within Great Britain as a whole (32.9%).

F.1.3 Of the relevant boroughs the LB of Richmond upon Thames and the LB of Wandsworth have the lowest proportions of residents with no qualifications (at 4% and 5.4% respectively). By contrast, the LB of Tower Hamlets (14.2%), LB of Newham (13.8%), LB of Ealing (11%), LB of Hammersmith and Fulham (10.8%), RB of Greenwich (10.7%), LB of Lambeth (10.5%), LB of Southwark (10.2%) and LB of Lewisham (10.1%) have slightly more residents with no qualifications than Greater London and Great Britain as a whole.

F.1.4 The proportion of residents educated to NVQ2 or above within the relevant boroughs is broadly in line with, or greater than, levels within Greater London (71.4%) and Great Britain (69.7%) as a whole, with the exception of the LB of Newham (59.5%) and LB of Tower Hamlets (67.3%).

F.1.5 A number of boroughs have a greater proportion of residents with the highest level of qualifications (NVQ4 or above) than within Greater London and Great Britain as a whole. These are the LB of Wandsworth (65.6%), City of Westminster (59.8%), LB of Lambeth (59.7%) and RB of Kensington and Chelsea (59.7%). In contrast, the LB of Newham (39.3%) and LB of Greenwich (43.4%) have slightly smaller proportions than Greater London, although both boroughs have a greater proportion than Great Britain as a whole.

Plate F.1 Workforce qualifications



Source: ONS (2012)

F.1.6 Within Greater London, 75.1% of residents aged 16 to 64 are economically active[xii], slightly below the average for Great Britain (76.5%). Of the 13 relevant boroughs, the LB of Wandsworth (81.6%) and LB of Lambeth (81.6%) have the highest rates of economically active residents, whilst the LB of Newham has the lowest (67.5%).

F.1.7 The employment rate amongst 16 to 64 year olds is 68% in Greater London, slightly less than Great Britain as a whole (70.2%). Most of the 13 relevant boroughs experience lower employment than Greater London and Great Britain. By contrast the LB of Wandsworth (76.9%), LB of Richmond upon Thames (73.9%) and LB of Lambeth (72.3%) have the highest employment rates.

F.1.8 Within Greater London the unemployment rate amongst those aged 16 to 64 is slightly higher than within Great Britain as a whole (9.5% and 8.2% respectively). Of the affected boroughs, the LB of Newham (15.3%), LB of Tower Hamlets (13.2%), LB of Southwark (11.4%), RB of Greenwich (11.4%), LB of Ealing (11.2%), LB of Lambeth (11.3%) and LB of Hammersmith and Fulham (9.6%) have a higher proportion of unemployed residents than the Greater London and Great Britain averages. Conversely, the LB of Richmond upon Thames has a notably lower proportion of unemployed residents (4.7%).

[xii] Economically active people are defined as people who are either in employment or unemployed.

F.1.9 Within ethnic minoritiesxiii, 31.1% of residents within Greater London are economically inactive, slightly less than within Great Britain as a whole (32%). A number of the relevant boroughs have considerably greater rates of economically inactive ethnic minority residents: the RB of Kensington and Chelsea (44%), LB of Tower Hamlets (42.7%) and City of Westminster (42.3%). In contrast, the LB of Lewisham (24.2%), LB of Lambeth (25.4%) and RB of Greenwich (25.5%) have somewhat lower rates of economic inactivity within ethnic minority residents, compared to Greater London and Great Britain averages.

F.1.10 It is estimated that the proportion of 16 to 18 year olds in Greater London who are 'Not in Education, Employment or Training' (NEET) is 4.5%, somewhat below the average for Great Britain (6.1%). Many of relevant boroughs experience a higher instance of 16 to 18 year olds NEET than Greater London and Great Britain as a whole, for example within the LB of Newham (14.4%), LB of Lewisham (13.1%) and RB of Greenwich (11.4%). In contrast the RB of Kensington and Chelsea (3.6%) and LB of Hammersmith and Fulham (4.4%) have slightly lower levels than Greater London average, and the City of London has the lowest proportion (0.3%). The Annual Population Survey uses ten 2010 Standard Occupational Classification (SOC) codes to record residents' occupations.

F.1.11 Table F.1 shows that within Greater London there are approximately 960,000 people employed in Professional occupations (SOC code 2), representing 25% of all occupational jobs. Within Skilled Trades occupations (SOC band 5) there are approximately 290,000 people employed, representing 7.6% of the total number of occupational jobs. There are approximately 510,000 jobs (13.4%) within Elementary occupations (SOC code 8) and Process Plant and Machine Operatives occupations (SOC code 9) combined.

F.1.12 The proportion of people employed within Professional, Process Plant and Machine Operatives and Elementary occupations is higher within Greater London than within Great Britain as a whole. However, within Skilled Trades occupations there are a higher proportion of jobs within Great Britain as a whole (10.8%) than within Greater London (7.6%).

F.1.13 There is a greater proportion of Professional occupations in most of the 13 relevant boroughs than within Greater London as a whole (25%), particularly within the LB of Wandsworth (30.7%), LB of Richmond upon Thames (30.2%), City of Westminster (29.9%) and LB of Lewisham (29.6%). The sole exception is the LB of Newham, in which 17% of jobs are within Professional occupations.

F.1.14 Most of the relevant boroughs have a lower proportion of Skilled Trades occupations than the average for Greater London (7.6%) and Great Britain (10.8%), with the exception of the LB of Newham (10.4%), LB of Ealing (9%) and LB of Greenwich (8.2%).

[xiii] The figures presented for economic inactivity among ethnic minorities have been taken from the Annual Population Survey 2011.

Table F.1 Occupational profile

Borough	SOC 2010 Band 2 - Professional Occupations	SOC 2010 Band 5- Skilled Trades Occupations	SOC 2010 Bands 8 and 9 - Process Plant & Machine Operatives; Elementary Occupations
Ealing	27.1%	9%	17.2%
Westminster	29.9%	5.5%	7.4%
Tower Hamlets	22.7%	3.9%	14.8%
Wandsworth	30.7%	3%	8.9%
Newham	17.1%	10.4%	23.8%
Southwark	27.6%	6.6%	12.8%
Lambeth	24.4%	4.9%	12.5%
Lewisham	29.6%	5%	9.5%
Hammersmith and Fulham	26.4%	6.8%	7.9%
Greenwich	20.5%	8.2%	20.9%
Richmond upon Thames	30.2%	6.9%	6%
Kensington and Chelsea	21.4%	3.8%	10.5%
City of London	-	-	-
Greater London	**25%**	**7.6%**	**13.4%**
Great Britain	**19.2%**	**10.8%**	**17.4%**

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