King’s Cross Central
Environmental Statement

VOLUME 3:
Specialist Reports

Part 11 Urban Services Specialist Report
Part 12 Socio-economic Specialist Report
Part 13 Health Specialist Report
Part 14 Nature Conservation Specialist Report

Prepared for Argent St George,
London and Continental Railways
and Exel

May 2004
King's Cross Central

Environmental Statement

Volume 3: Specialist Reports

Part 11 Urban Services Specialist Report by Arup
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Environmental Statement

Volume 3: Part 11 Urban Services Specialist Report

Prepared for Argent St George, London and Continental Railways and Exel by Arup

May 2004
11 Urban Services Specialist Report

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11.1 Introduction

11.1.1 This part of the Environmental Statement assesses the effects of the proposed
development on the existing utility network and waste services. Due to the nature of
urban services (utilities) the study area extends beyond the planning application
boundaries to include selected sections of the existing utility network, which would be
likely to form the points of supply to the proposed development. This section has
therefore been structured around individual utilities, rather than geographical areas.

11.1.2 The assessment has been undertaken to identify the effects based on the complete
development. It is important to note that the development is planned to be undertaken in
a phased manner and the utility provision would, where possible, be designed accordingly.
However, not all utilities lend themselves to phasing. Where appropriate, some
discussion on the effects of phasing has been included where utility providers have
indicated this is feasible.

11.1.3 Part 3.2 of this Environmental Statement describes the development specifications for site
infrastructure and utilities including surface water drainage. In addition Main Site
Parameter Plan 018:Utilities shows significant aspects of on-site provision and an
additional plan CONTEXT 001:Off-Site Utilities indicates the potential routing of off site
utility provision.

11.1.4 Surface water drainage is dealt with in Part 15 of this Environmental Statement.

11.1.5 The effects of noise, dust and traffic from construction works associated with urban
services are considered in Part 4 Construction Effects and the relevant topic based
specialist reports. Construction waste is also dealt with in Part 4.

11.2 Methodology and Assessment Criteria

Assessment

11.2.1 The assessment methodology for the EIA as a whole is described in Part 1.3. This section
considers the specific methods of assessing the impacts related to urban services only.
The assessment considers the effects on existing utilities of having to provide new
supplies to the site, both physically and as a resource; diverting existing utilities to
facilitate development; and the effect on existing utilities of constructing and operating
the King’s Cross Central development.

11.2.2 The assessment comprised:

- site visits;
- reviewing existing utility records to establish a preliminary baseline;
- estimates of utility demands for the proposed development;
- extensive consultation with the utility companies to confirm the capacity of existing
  networks and to establish the works that may be required on and off site to meet
  the predicted demands, and also to establish the ability to meet the demands in
  phases to reflect the potential build-out programme;
- Assessment of impacts, including during construction and during operation, taking into account mitigation included in the proposals; and
- Identification of possible further mitigation measures and options, where appropriate.

**Significance Descriptors**

11.2.3 The following significance descriptors are used in the assessment of effects in this report:
- **Major** – effects of the development of greater than local scale
- **Moderate** – effects of the development that may be judged to be important at a local scale (i.e. in the local planning context)
- **Minor** – effects that are of low importance in the decision making process
- **Negligible** – effects that are below normal levels of perception and are thus not material

11.2.4 The following terms are used to identify the time-scale of impacts:
- **Short-term**, <12 months
- **Medium term**, 1–5 years
- **Long term**, >5 years

11.2.5 Considerations in applying the above criteria to a typical activity of installing a new utility supply to the site would include:
- identifying the nature of the work required; e.g., excavating a length of trench along an existing road, connecting the new pipe to an existing pipe;
- estimating the duration of the work required; typically less than 12 months;
- identifying in particular whether there are any significant long term effects on either the utility being considered or other utilities that might be adjacent or affected indirectly; and
- identifying whether the quantum of the supply required has an effect remote from the site and/or requires other work to mitigate the reduction in remaining available utility capacity.

**11.3 Consultations**

11.3.1 Unlike other aspects of the environmental assessment the impact of the proposed development on utility networks is generally not assessed against nationally or locally specified criteria. Impact is typically addressed in terms of the works required to provide the utility demands and the resultant physical changes required to existing networks to provide the new demand and also any issues relating to residual utility capacity. The potential impact is usually assessed in conjunction with the relevant utility company.
11.3.2 During preparation of the Consultation Draft Scoping Report, and this subsequent Environmental Statement, several meetings have taken place with the utility companies and reviews held to ensure the information contained herein has remained up to date.

11.3.3 Extensive consultation has been conducted with all the relevant statutory utility providers and agreement reached on technically feasible means of providing the relevant utility supplies to the site. The statutory consultees include the Environment Agency and the London Boroughs of Camden and Islington.

11.3.4 In addition, consultation has taken place with various non-statutory consultees, including:

- Network Rail;
- The Channel Tunnel Rail Link Project through Rail Link Engineering and Union Railways North;
- Thames Water Utilities Ltd
- EDF Energy (formerly 24Seven, part of the London Electricity Group);
- Scottish & Southern Energy plc;
- National Grid Company (part of National Grid Transco);
- Transco (part of National Grid Transco);
- British Telecom;
- WaterGrid.

11.3.5 Estimated demands for the proposed development have been issued to the providers, followed by discussion of those forecast loads. Options have been considered and the likely off site works, including any reinforcement required for servicing the site, have subsequently been identified together with programme information and phasing where appropriate.

**Context to Utility Provision**

*Power*

11.3.6 The incumbent infrastructure electricity company is EDF Energy. They would be the default provider of new electrical infrastructure and are responsible for the operation and maintenance of the existing electrical distribution assets surrounding the site.

11.3.7 EDF Energy and National Grid Company have been consulted by the applicants regarding the possibility of utilising the existing buried 400kV circuits located along the northern towpath of the Regent’s Canal to supply the site. Whilst theoretically possible, there are substantial technical hurdles such that this approach would be fraught with unacceptable risks. Therefore this option is not viable and has not been considered as part of the assessment.

11.3.8 EDF Energy has identified the most viable means of providing the required electrical supply to the site. Spare capacity has been identified at two substations close to the site. Supplies to support a proportion of the site would be available from the Longford Street sub station, approximately 1.5km to the west of the site. Bulk supply serving either the complete development, or the major proportion not served from Longford Street, would
be available from the City Road primary substation approx. 3km to the south east of the site.

11.3.9 **Scottish & Southern Energy** is one of a number of potential alternative electrical infrastructure providers to the site. At present they have proposed a similar technical solution to EDF Energy for providing power to the site.

**Gas**

11.3.10 During consultation with Transco, the provider of gas infrastructure, various alternative supply arrangements and phasing options have been discussed. Transco has identified a range of flexible gas supply solutions from adjacent low-pressure mains dependant on the site supply requirements.

11.3.11 An independent gas transporter GSC Services has also been consulted during the consultation process to identify alternative potentially beneficial solutions. No alternative solutions were apparent given the proximity of the large diameter low and medium pressure mains adjacent to the site.

**Potable Water**

11.3.12 Thames Water Utilities Ltd, the incumbent water company, has identified several constraints related to providing a resilient potable supply to the proposed development.

11.3.13 These issues include identifying a suitable source of water, the strategic distribution of that water within the London network, and the local issue of conveying sufficient water to the site. Thames Water Utilities Ltd has undertaken a potable supply study to establish the most economic means of providing a supply.

11.3.14 Thames Water Utilities Ltd has established that as a result of several very significant schemes, including King's Cross Central, all of which would be supplied from the Coppermills Water Treatment Plant, a combination of reinforcement measures would need to be implemented. These measures would provide adequate supply for the major schemes identified and benefit Thames Water Utilities Ltd by providing additional resource to address future load growth.

11.3.15 The works that Thames Water Utilities Ltd consider may be required include relining existing mains, changes to the existing network management, new and revised pumping arrangements and lengths of new tunnel and pipe work and associated shafts. These works are considered by Thames Water Utilities Ltd to be part of their own network development.

11.3.16 Thames Water Utilities Ltd has also identified the need for local works to the surrounding infrastructure in order to supply the site. The work is likely to comprise two new lengths of large diameter main.

11.3.17 The Applicants have held preliminary discussions with WaterGrid (a joint venture between Anglian Water, Bristol Water and British Waterways) to investigate alternatives to traditional "mains" supply. There could be options in due course to take supply from the Regent's Canal or boreholes, either on or off site, and there may be sustainability benefits in doing so. No decisions have yet been taken to pursue any of these alternative options, which may or may not be practicable, depending upon later detailed studies. Any alternative supply would require separate approvals and consents from the appropriate
regulatory authorities. For all of these reasons, alternative supply options are not considered further as part of this Environmental Statement.

Foul Drainage

11.3.18 Thames Water Utilities Ltd is the incumbent drainage authority providing public storm and foul drainage to the area, typically via existing combined sewers. Detailed meetings, discussions and design studies have taken place with Thames Water Utilities Ltd to determine the available spare capacity of the existing combined sewer network in order to establish available foul flow capacity.

11.3.19 On the basis that existing stormwater flows from the former Kings Cross Railway Lands previously discharged to the existing combined sewers, Thames Water Utilities Ltd have undertaken a hydraulic modelling study of the proposed storm and foul arrangements discharging to the existing combined sewer network. Thames Water Utilities Ltd has confirmed there is adequate capacity to accommodate the proposed foul flows without the need for off site works.

Waste

11.3.20 Municipal waste is collected at present by the local authorities and managed by the North London Waste Authority. At present, this waste is managed through two waste transfer stations and taken either to the waste to energy plant at Edmonton or to landfill outside London. These contracts will be reviewed during the life of the development and new waste management routes may become available as facilities are provided in accordance with the London and unitary development plans now being prepared. Industrial and commercial waste would be collected by appropriately licensed waste management companies and managed and disposed of through facilities available at the time.

Communications

11.3.21 Information has been collected from possible telecommunications providers to establish what existing equipment is located in the surrounding area. BT, Telewest Broadband, Cable and Wireless and NTL, WorldCom (now MCI Inc.) and EasyNet provided details of the telecomms infrastructure in the area. Further details are provided in section 11.4.

11.3.22 In addition BT conducted a study of the capacity of both the network and local exchange.

11.3.23 Other telecommunications providers (including –Your Communications, Thus, Level 3, 186k, Fibrenet, Infolines, Consol, Viatel, Call Communications) have either not responded to initial enquiries or have responded but with no information, so have been presumed to hold no equipment in the area.
11.4 The Existing Situation

Utilities Description: Overview of Current Situation

11.4.1 The primary existing networks for power, water, gas and telecommunications follow the routes of the main highways; York Way at the Eastern site boundary; Pancras Road in the south-west; and Goods Way crossing the site. Secondary networks connect to existing buildings in the southern part of the site, between Battlebridge Road and Euston Road. The substantial portion of the site lying to the north of the Regent's Canal is sparsely serviced, the only significant element being an electricity substation near the Granary which serves Exel's properties. A combination of existing relatively small diameter local foul sewers and large diameter combined sewers are located along existing roads.

11.4.2 A major gas governor station has been relocated to a new position on the site at the junction of Pancras Road and Battle Bridge Road as part of the CTRL works.

Power (refer to Figure 11.1)

11.4.3 EDF Energy's infrastructure comprises high voltage circuits, typically at 11kV and low voltage cables typically at 415V and 240V, located under highways and footpaths, notably York Way and a connection from Goods Way over the Regent's Canal to an existing substation just north of the bridge.

11.4.4 National Grid Transco's 400kV Supergrid circuits cross the site uninterrupted, buried in the northern towpath of the Regent's Canal. The cables run in ducts, are oil-insulated and water-cooled and placed in a shallow concrete trough with pre-cast concrete removable covers. The cables connect between the Lisson Grove (St. John's Wood) and City Road substations, which supply substantial parts of central, and north London, including Oxford Street, but not the vicinity of King's Cross.

Water (refer to Figure 11.2)

11.4.5 The strategic London Water Ring Main, a tunnel some 30m below ground level, crosses the site from west to east, entering near the junction of Goods Way and Pancras Road and exiting beneath the southern end of King's Cross Station. This main is used for water transfer between “water zones” rather than for direct water supply to developments.

11.4.6 Thames Water Utilities Ltd also owns several water mains of varying diameter within and adjacent to the site located within public roads and along wayleaves and easements. These include 4” and 5” mains along York Way, a 6” main along Pancras Rd, 150mm main along Goods Way and a 6” main along Wharf Rd within the site.

Foul Sewage (refer to Figure 11.3)

11.4.7 Two strategic combined foul and storm sewers bisect the site north of Regent's Canal. The Camden Sewer, a combined sewer (various internal dimensions; 1448mm high x 990mm wide max) runs north-south and passes beneath Regent's Canal/King's Cross Railway lines and into York Way. The Middle Level Sewer No. 2 (internal diameter estimated 2500mm) runs east-west across the northern end of the site.
11.4.8 South of Regents Canal, the Fleet Storm (2134mm dia), the Camley St Sewer (1143mm x 813mm) and Fleet Main Line sewer (internal dimensions 2438mm x 2591mm max) provide drainage typically via combined gravity sewers which are north-south beneath Pancras Road, in the west of the site.

11.4.9 Currently, there is no foul drainage to the Triangle Site. Existing stormwater drainage is provided by two outfalls to the Middle Level Sewer No. 2 (a combined sewer) running approximately west-east. Historically the Triangle Site was covered with railway sidings and railway arches. The railway sidings were provided with extensive undertrack drainage and records indicate that they discharged to the Middle Level Sewer. Thames Water Utilities Limited is responsible for the operation and maintenance of the strategic sewers identified above.

Gas (refer to Figure 11.4)

11.4.10 A major district gas governor station, a significant element of London's strategic gas supply infrastructure, is located in the southern part of the site at the junction of Pancras Road and Goods Way. It is supplied from the south by a 900mm medium-pressure main running beneath Pancras Road. It in turn supplies gas into the low-pressure network via two 900mm low-pressure mains.

11.4.11 National Grid Transco own several gas mains throughout the site, predominantly located in the main roads. There are several 600mm LP mains that run through Camley Street, Pancras Road, Goods Way and York Way. There are also several smaller mains that run through side roads in the site, including a 180mm main to the Western Coal Drop.

Telecommunications

11.4.12 BT has a variety of cables running through the site adjacent to the roads. Cable sizes include (amongst others) D5, D42, D54 and D64 specification according to the required capacity. There is also a cable attached to the wall on the northern towpath of the Regents Canal, running in a north-west direction.

11.4.13 EasyNet Telecom also has fibre optic cables running through the northern towpath of the Regent’s Canal, crossing through the entire width of the site.

11.4.14 Telewest Broadband has cables running alongside Camley Street, Pancras Road and passing through Goods Way towards York Way.

11.4.15 MCI Inc. has ducts and cables (formerly owned by WorldCom) close to the east of the site that would be unaffected by the proposals.
11.5 Baseline 2006/7

11.5.1 The CTRL project will have its own power supply for traction and signalling, with infrastructure contained within the CTRL corridor. Known changes which affect the baseline are:

- relocation of lengths of the utilities network as part of the re-routing of York Way, Pancras Road and Goods Way has recently been completed;
- LUL’s works at the southern end of the site may result in some further minor changes to the utilities layout; and
- an enhanced water supply along Coach Road

Physical Constraints

11.5.2 The following constraints to development of the utility network have been identified:

- existing 400kV high voltage cables are located along the northern towpath of the Regent’s Canal, these restrict the nature of any works along the canal interface;
- there will be a number of CTRL/LUL and Network Rail facilities including utility routes, substations and roads constructed at the southern end of the site. These would have to be either maintained or relocated;
- there are existing utilities servicing Network Rail that may be affected by the proposed development, mainly towards the southern end of the site. Solutions would be agreed during the detailed design stage to ensure that these services are maintained, if required;
- existing utility congestion, along Pancras Road and Goods Way in particular, may restrict the ability to locate new utilities in the preferred locations;
- the Regent’s Canal bisects the site west-east. It presents a significant obstruction to utility distribution routes between the northern and southern areas of the development. Where possible, the design of new bridges would facilitate new utility crossings;
- if the proposed relocation of the existing gas governor, which is of strategic importance, is implemented, diversion of other more minor utilities in advance of the relocation would be required;
- the existing Camden Sewer is located within the site north of the canal, the sewer is at a shallow depth and would either need to be diverted or restrict the location of proposed buildings;
- at depth the Thames Water Ring Main crosses the site south of the canal in a west-east direction; this may restrict deep piled building foundations;
- the Thameslink 2000 tunnels are proposed at shallow depth and would cross the site north of the canal from the south west to the north east, these tunnels would primarily affect building basements, foundation types, building heights and the route of any large diameter sewers; and
the LUL pedestrian subway connection from the LUL northern ticket hall to St Pancras station is at a very shallow depth and places constraints on any diversions of existing services and provision of new utilities along Pancras Road.

**Study Limitations**

11.5.3 The following limitations have been identified during the course of compiling the baseline:

- information on the location of utilities in surrounding streets has been compiled from several sources of varying age and status. The accuracy of this information has not yet been confirmed by intrusive route proving exercises; and
- telecommunication providers have provided limited information about services around the site.

11.6 **Proposals**

11.6.1 As explained in Part 3.2 of this Environmental Statement, the proposed development is defined by Development Specifications for the Main Site and the Triangle Site incorporating a number of Parameter Plans. The Development Specifications define and fix the parameters of the development and form the basis of the assessment of effects on urban services.

11.6.2 The estimation of new utility demands for the Main Site and the Triangle Site has been based on appropriate unit rates for the different types of buildings and includes a further provision to serve the public realm (e.g. street lighting). The overall demands for power, gas, water and telecoms together with the forecast foul discharges have been discussed and agreed with the respective utility companies. They are based on a set of realistic worst-case assumptions. Further sensitivity testing has indicated the extent and nature of the works that may be required off site, shown indicatively on Context 001 (Main Site Development Specification), and that the on site trench sizes used to calculate the import and export of materials, are robust enough to accommodate the full range of build out scenarios allowed by the Development Specifications.

**Assumptions and Study Parameters**

11.6.3 The following assumptions and study parameters form part of the assessment of the proposed development and its ‘worst-case’ impacts on urban services.

11.6.4 Utility works on and off site during all phases of development and also during any future maintenance would be undertaken in accordance with the provisions of the NRSWA for adopted highways and privately owned estate roads alike.

11.6.5 The NRSWA provides a legislative framework for street works activities by undertakers, including public utilities. The aim is to balance the respective statutory rights of highway authorities and undertakers to carry out works in the highway against the right of the users to expect the minimum disruption from street works. The obligations under the act include notification of the works, estimating the duration of the works with possible penalties for late completion, co-ordination of the works, the requirement to minimise inconvenience to road and pedestrian users and safety.
11.6.6 As indicated on Main Site Parameter Plan 018, duct space would be available within new bridge crossings across the Regent’s Canal. There is also space available within Maiden Lane Bridge for service routes.

11.6.7 An estate management company would be established and would ensure that all activities relating to the phasing and installation of on-site utilities are co-ordinated.

11.6.8 Off site supply/reinforcement requirements for this site would not be altered significantly by other future developments.

11.6.9 The Regional Electricity Company would be required to enhance the network to provide further capacity for background growth.

11.6.10 The relevant telephone company would be required to expand facilities to ensure the appropriate capacity is provided.

11.6.11 Desk studies and consultations with utility providers indicate that sufficient space is available within the local road network for off site utility reinforcement and new supplies. In due course this would be confirmed by undertaking excavation and inspections to confirm the feasibility of the route chosen. In the event that such space was not available, alternative routes would be identified and subsequently validated.

11.6.12 As stated in the Development Specifications, all new buildings would be designed to achieve high BREEAM and EcoHomes ratings.

11.6.13 The base build installation would employ water efficient fittings wherever possible. For example commercial office buildings would be fitted with dual or low flush toilets.

11.6.14 Measures to mitigate the impact of installing new utilities on-site would include specification of working hours, consideration of noise when selecting plant and directing vehicles along agreed local access routes. Method Statements for specific activities would be produced.

11.6.15 The following control measures would be followed for the diversion and installation of utilities on site:-

- appropriate selection of plant to mitigate noise, dust and vibration;
- use of hoardings and screens to mitigate noise and dust transmission;
- control of working hours and noisy activities;
- use of water sprays to damp-down area prone to dust generation;
- use of vehicle and wheel washing facilities;
- monitoring of control measures; and
- control of surface water runoff from and into excavations.

11.6.16 Works would be programmed at the appropriate times of the year (e.g. summer months for gas), when utility demands are typically less.

11.6.17 As part of the on-site infrastructure works, the potential for residual ground contamination within any construction site would be confirmed prior to the start of any excavation work. This would be maintained when trenching is carried out for installation of new utilities as part of the development.
11.6.18 The off-site works required to install utility supplies to the site would potentially give rise to isolated, temporary noise, dust and air quality effects. These impacts are controlled primarily via the New Road and Street Works Act and any standard requirements of the Highway Authority.

Worst Case

11.6.19 There is no single “worst case” development scenario for urban services. Instead an individual worst case for each type of service has been assessed. The majority of impacts would be due to off-site works within the local area. Off site “worst case” works would include:

- new power supplies to be provided from City Road and from Longford Street substations (both operated and owned by EDF Energy), which includes the laying of new 132kV and 11kV buried cables along existing public roads;
- new water supply connections from an existing main at Royal College Street via new mains and via a main in Coach Road (underneath new St Pancras Station Platform Extension) and from a main in Caledonian Road via Copenhagen Street;
- new gas supply points from York Way via the junction at the northern end of the site and the junction at Copenhagen Street, east of the site;
- multiple points of connection of foul discharge from the site via new and existing connections to the existing and diverted combined public sewer network;
- new connections for telecomms from either the BT Tower, Clerkenwell or Euston telephone exchanges requiring additional comms infrastructure within existing public roads; and
- direct connections to the Triangle Site from existing infrastructure or via new utility connections from the Main Site.

11.6.20 Traffic management would be required within the surrounding residential and commercial areas while utility supply or reinforcement work is undertaken. More details are included in Part 4 Construction Effects and are therefore not discussed in detail in this report.

11.6.21 Within the site, existing tenants north of the canal would generally vacate the existing buildings. The phased implementation of the development and more particularly the phasing of utility supplies could affect utilities already installed as part of earlier phases of King’s Cross Central.

11.6.22 South of the Regent’s Canal primary utility routes would generally be installed in advance of building construction commencing, leaving only building connections and secondary distribution routes to be constructed. Co-ordination would be required with any existing utilities providing supplies to LUL or Network Rail facilities at the southern end of the site.

11.6.23 Within the site, in addition to utility diversions required as a result of road re-alignment to Goods Way and Pancras Road, and utility works along York Way, further diversions and abandonment of existing utility supplies to buildings to be retained may be carried out. The most significant proposed diversionary works comprise:-

- diversion of the Camden Sewer;
- relocation of the district gas governor and extension of the associated large diameter low and medium pressure gas supply mains;
- abandonment of existing building utility connections; and
- general utility diversions along Goods Way and Pancras Road.

11.6.24 The utility diversions required could have short-term negative impacts on the existing utility network.

11.6.25 Table 11.1 below lists and describes the worst case works, and identifies the assumed mitigation as described above.
### TABLE 11.1: Summary of Mitigation Measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Summary Description</th>
<th>Mitigation Assumed as Part of the Proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Diverting existing utilities in local roads | To allow new road connections from site to tie into existing highway network | - Co-ordination between utilities  
- NRSWA, Highway Authority’s standard requirements |
| Providing new utility supplies from off site locations to the site | New supplies along existing roads and footpaths could restrict tree planting and cause disruption as a result of maintenance requirements | - Co-ordination between utilities  
- NRSWA, Highway Authority’s standard requirements |
| Trenching through potentially contaminated ground | When excavating trenches for utilities onsite there is a risk of encountering contaminated ground | - Identification of potential for residual ground contamination prior to excavation work onsite. |
| Use of imported granular fill | Bedding and surround material for installation of services onsite | - Use of site-won material wherever possible for onsite utilities. |
| **POWER** | | |
| New power supplies to the site | Provision and quantum of new power supplies provides the potential for further enhancement to serve other developments | - Co-ordination required by utility companies  
- NRSWA, Highway Authority’s standard requirements |
| New power supply from City Road (construction) | Laying of new 132kV cables in public roads. Estimated installation time is 1-year | - Co-ordination between utilities  
- NRSWA, Highway Authority’s standard requirements |
| New power supply cables from Longford Street (construction) | Laying of new 11kV cables in public roads. Estimated installation time is 6-months to 1-year | - Co-ordination between utilities  
- NRSWA, Highway and Local Authority’s requirements |
<p>| Utilising power supply from Longford Street | Purchasing existing spare capacity to supply the site | - Regional Electricity Company required to enhance network to provide further capacity for background growth. |
| Utilising power supply from City Road | Electricity taken from a bulk supply point with significant spare capacity | - Regional Electricity Company required to enhance network to provide further capacity for background growth. |</p>
<table>
<thead>
<tr>
<th>Impact</th>
<th>Summary Description</th>
<th>Mitigation Assumed as Part of the Proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of Sub-station on site (construction)</td>
<td>Sub-station installed within the site boundary</td>
<td>▪ Construction control measures as listed in para. 11.6.15</td>
</tr>
<tr>
<td>Operation of primary substation on site</td>
<td>The effect on other utilities of operating and distributing electricity around the site at 11kV</td>
<td>▪ Co-ordinated design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Some screening of adjacent copper based telecom cables may be required</td>
</tr>
</tbody>
</table>

**FOUL**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Summary Description</th>
<th>Mitigation Assumed as Part of the Proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td>New foul water discharge points (construction)</td>
<td>Additional/replacement/existing connections from the site to the public combined sewer in public roads</td>
<td>▪ Co-ordination between utilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ NRSWA, Highway Authority’s standard requirements</td>
</tr>
<tr>
<td>New foul flow discharges from the site</td>
<td>Increased foul flows within an overall combined flow</td>
<td>▪ Use of water efficient fittings in base build to reduce quantity of foul flows from the site.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Specification of new drainage infrastructure (see ‘reduced peak combined flows to Camden Sewer’ below)</td>
</tr>
<tr>
<td>Separation on site of storm and foul flows</td>
<td>Separate storm and foul sewers on the site provide future flexibility for separating flows off site thus reducing impact of foul sewer overflows</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Construction of Camden Sewer Diversion</td>
<td>Re-routing of existing large diameter pipes requiring temporary interruption of flows</td>
<td>▪ Works to be undertaken at times of low flow with adequate over pumping (or other) measures in place</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Construction control measures as listed in para. 11.6.15</td>
</tr>
<tr>
<td>Operation of diverted of Camden Sewer</td>
<td>Possible removal in part of sewer from beneath the Granary complex and removal of associated flow restriction</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Reduced peak combined flows to Camden Sewer</td>
<td>A 10% reduction of overall peak flow discharge (foul and storm) from Main Site.</td>
<td>▪ A 10% reduction of overall peak flow discharge (foul and storm) from Main Site.</td>
</tr>
<tr>
<td></td>
<td>(NB Also 10% reduction in peak flow discharge (stormwater) from Triangle Site to the Mid Level Sewer)</td>
<td>▪ (NB Also 10% reduction in peak flow discharge (stormwater) from Triangle Site to the Mid Level Sewer)</td>
</tr>
</tbody>
</table>
### WATER SUPPLY

<table>
<thead>
<tr>
<th>Impact</th>
<th>Summary Description</th>
<th>Mitigation Assumed as Part of the Proposals</th>
</tr>
</thead>
</table>
| New water supply connection via existing Coach Road connection (construction) | 1200m length of new 450mm diameter supply pipe along Royal College Street and Pancras Road to connect to existing connection under Coach Road. | ▪ Co-ordination between utilities  
▪ NRSWA, Highway Authority’s standard requirements |
| New water supply connection via Copenhagen Street (construction) | 400m length of 450mm diameter supply pipe to the site from the existing main in Caledonian Road, via Copenhagen Street | ▪ Co-ordination between utilities  
▪ NRSWA, Highway Authority’s standard requirements |
| Operation of new supplies | Enhancement of existing local network provides additional spare capacity for use by others | Not Applicable |
| Quantum of new potable supplies to the site | Demand for potable supplies to the site, which is a function of occupier requirements and design. | ▪ Ensure water efficient fittings utilised as part of building design  
▪ Limit new supplies and off site works required to those absolutely necessary and thereby ensure a sustainable approach to water supply |

### GAS

<table>
<thead>
<tr>
<th>Impact</th>
<th>Summary Description</th>
<th>Mitigation Assumed as Part of the Proposals</th>
</tr>
</thead>
</table>
| Relocation of gas governor and associated mains (construction) | 200m length diversion of 2 No. 900mm LP gas mains and 350m length of 1 No. 900mm HP gas main | ▪ Co-ordination between utilities  
▪ NRSWA, Highway and Local Authority’s standard requirements |
| Operation of relocated gas governor | Same impact as existing gas governor | Construction to match or be better than existing |
| New off-site gas connections | Connections to existing mains in York Way at two locations | ▪ Co-ordination between utilities  
▪ NRSWA, Highway and Local Authority’s requirements |
| Additional gas consumption as a result of development | Operation of new gas supplies to the site via new connections to the low pressure network | ▪ All new buildings designed to achieve high BREEAM and EcoHomes ratings |

### COMMUNICATIONS

<table>
<thead>
<tr>
<th>Impact</th>
<th>Summary Description</th>
<th>Mitigation Assumed as Part of the Proposals</th>
</tr>
</thead>
</table>
| Limited reinforcement of the existing comms duct network off site (construction) | Laying new ducts along existing roads and footpaths | ▪ Co-ordination between utilities  
▪ NRSWA, Highway Authority’s standard requirements |
Impact | Summary Description | Mitigation Assumed as Part of the Proposals
---|---|---
Installation of additional comms cables within the site along previously installed ducts (construction) | Lifting of chamber covers and providing additional comms cables | ▪ Co-ordination between utilities  
▪ Construction control measures as listed in para. 11.6.15

Operation of additional comms services to the site | Utilisation of existing capacity at the telephone exchanges | ▪ Relevant telephone company required to expand facilities to ensure appropriate capacity is provided.

**WASTE**

Disposal of municipal and commercial/industrial waste | Municipal waste would be collected and disposed of by the London Boroughs of Camden and Islington. Disposal of commercial/industrial waste would be the responsibility of individual occupiers and would be carried out by contractors. | Legal requirements of the Environmental Protection Act 1990 Part II including the ‘Duty of Care’.

### 11.7 Assessment of Effects

#### Power

**Power Supply to the Site**

11.7.1 Following extensive consultation with EDF Energy and alternative electrical infrastructure providers it has been established that power supply in the worst case, could be provided via an initial supply taken at 11kV, west of the site, from the Longford Street substation, followed by a larger bulk supply at 132kV taken from the existing grid supply point at City Road. Both substations are operated by EDF Energy. The use of two power supplies represents the worst case impact in terms of streetworks.

11.7.2 The proposals would require at some stage of development supplies from City Road but it may not be practicable to deliver this infrastructure from the outset. This would mean relying initially on a limited supply from Longford Street and then taking supplies from City Road later.

11.7.3 From Longford Street, approximately 1.5km to the east of the site, at least 2, and potentially 3 or 4, 11kV cable groups would need to be buried along existing road corridors to the site, which would then be looped between buildings to form part of an on-site ring main. An indicative route is shown on drawing CONTEXT 001 (Main Site Development Specification). The construction of the off-site route is likely to have short-term duration and the impact on urban services is assessed as negligible in the local area.
11.7.4 EDF Energy has confirmed that at present Longford Street has 20MVA of spare capacity and sufficient space to expand the bus bar and switchgear to provide supplies to King’s Cross Central. EDF Energy is unable to reserve or commit this availability to King’s Cross Central without financial commitment.

11.7.5 The impact of utilising power supply from Longford Street is considered as long term, negative and minor on the basis that the existing spare capacity would be fully utilised by King’s Cross Central and therefore unavailable for existing customers, local new customers and background load growth.

11.7.6 New 132kV cables from City Road, approximately 3km from the site, would be installed in new buried ducts routed along existing roads, as shown on Parameter Plan KXC 018 and CONTEXT 001 (Main Site Development Specification). A ducted route would allow short lengths of trench to be excavated and consequently reinstated in a short period of time in advance of cable laying. This approach would reduce the extent of trench open at any one time and therefore reduce the impact of the installation of the new power supply cables generally but arguably not on other utilities. Existing utilities adjacent to the proposed excavations would be vulnerable to damage during excavation and backfilling works, which would still be required although the approach described would reduce the duration that the trench would remain open.

11.7.7 EDF Energy has confirmed that the City Road grid supply point is known at this stage to have significant spare capacity both spatially and in terms of electrical supply. Works required mainly comprise the installation of additional gas insulated switchgear, installation of additional sealing ends and connection of new 132kV cables and pilot cables.

11.7.8 Taking into account the above, the off-site work has been assessed to have medium term duration and the impact on services in the area is assessed as negative but negligible.

11.7.9 The above off-site works would be undertaken under the utility companies’ statutory powers. They do not form part of the King’s Cross Central applications for planning permission.

On-site power distribution

11.7.10 On site a 132/11kV main sub-station would be provided, which would serve as the electrical supply point for the site, excluding those buildings supplied from the Longford Street sub-station (if that connection were implemented). The majority of buildings would be connected to 11kV supplies via on site ring mains via a ducted cable network along internal site road corridors.

11.7.11 Individual buildings or groups of buildings would be provided with small substations that transform power from 11kV to 415V. Typically these substations would be located at basement or ground floor level within buildings. This approach is standard for any larger commercial building. Residential buildings would be provided with either smaller dedicated transformers or served as clusters of buildings.

11.7.12 In association with taking a bulk supply from City Road, a main electrical sub station would be provided on the western side of the site within the Multi Storey Car Park in development Zone T. The sub-station would provide the bulk supply point for electrical distribution within the site for the majority of the existing and proposed buildings other than any supplies taken from Longford Street. The sub-station would transform electricity from 132kV to 11kV, and would require an area of approximately 900m² (over one or
two levels) and could emit rejected heat either horizontally towards the CTRL embankment via louvres in a vertical wall or vertically via covered or open heat exchangers.

11.7.13 Electrical services within the site would be required to serve varying elements of infrastructure including security, street and amenity lighting, and illuminated signage both statutory and non-statutory. These supplies would be distributed around the site using buried duct and chamber systems where necessary and direct buried cables elsewhere.

11.7.14 The impact of installing and operating the 11kV distribution on site, in conjunction with the 132kV/11kV primary substation and new supplies to the site would have a negligible effect long term on the existing and proposed utilities network and would provide future opportunities to enhance local capacity and supply (positive impact).

Existing extra high voltage cables

11.7.15 National Grid Transco own and maintain two 400kV circuits located in the northern towpath of the Regent’s Canal. The cables are buried in a shallow concrete trough provided with removable covers. It is proposed that the canal environment would be improved which could include enhancement to the towpath surface finish and as part of these works access to the cables may be modified in some way subject to approval of British Waterways and National Grid Transco.

11.7.16 In respect of other utilities high voltage cables can result in inductance and interference issues to other cables laid in close proximity. It is not proposed to locate new utilities in close proximity to the existing cables. Therefore no significant impacts are considered likely with respect to existing and proposed utilities.

Gas

11.7.17 Based on estimated site demands, Transco has confirmed that low-pressure gas supply would be supplied to the site from the existing mains and, where appropriate, extended or diverted mains associated with the proposed relocation of the district gas governor, if implemented. No reinforcement works or works remote from the site would be required to supply gas to the site.

District gas governor

11.7.18 Subject to reaching technical and commercial agreement with Transco, the district gas governor, which serves as the main point of low-pressure supply to a significant area of London, would be relocated from its existing location within the southern part of the site to the proposed new location in development zone V.

11.7.19 The district governor is one of the largest in the UK and is of strategic importance to National Grid Transco. The relocation of the governor would require significant underground diversion and extension works to existing large diameter medium (1 No. 900mm) and low-pressure (2 No. 900mm) gas mains and other non-gas utilities along roads that are already congested with utilities. The work would be undertaken when gas demands are reduced during the summer months and also such that supplies were not interrupted, which would require the new station to be operable, at least in part, before decommissioning of the existing plant commenced.
11.7.20 Based on the work described above and the many utilities within the vicinity of the proposed site for relocation, the impact on existing and proposed utilities is assessed as negative, medium term and minor.

Gas supplies

11.7.21 The relocation of the gas governor and the impact on other services would be complex and would require significant space and could take approximately two years to complete. The operation of the governor would have the same long-term effects as the existing plant; therefore the effects would be negligible.

11.7.22 National Grid Transco has identified that gas supplies to the north of the site could be provided along the existing roads adjacent to and through the site. Resilience to the gas supply could be provided at points of entry to the site via Pancras Rd and York Way at the northern end of the site if necessary.

11.7.23 South of the canal, supply would be obtained from the low-pressure mains that are supplied from the district gas governor.

11.7.24 The new connections to the local pressure gas network would not cause disruption to gas or other utility supply and therefore the impact is considered negligible.

11.7.25 Within the site, a low-pressure mains network would be located along the internal road corridors which would be provided with connections and metering points to buildings, as required.

11.7.26 National Grid Transco has advised that the estimated time taken to install the primary on site services would be less than twelve months. The impact on the utility network of the gas supply to the site is considered to be negligible since it would not affect existing supplies and would be part of the planned infrastructure.

Potable Water

11.7.27 The “worst case” scheme for supply of potable water supply to King’s Cross Central would be via Thames Water mains. Local to the site the scheme would require new supplies to be provided via two new connections from existing large diameter Thames Water mains located to the west and east of the site.

11.7.28 In conjunction with Thames Water Utilities Limited, future water demands have been estimated and hydraulic modeling of the proposed demands and the existing water supply network has identified the most direct connection from the existing network to be via a 450mm dia main via Coach Road. This route would require a new main along Pancras Road from the 36” main at College Street southward to Coach Road; length approximately 1200m.

11.7.29 A second connection to ensure a resilient supply would require a new 400m length of 450mm diameter main from the existing 36” main in Caledonian Road, via Copenhagen Street.

11.7.30 A connection between the north and south of the site would be provided via a new 450mm main or equivalent within a new bridge over the Regent’s Canal.

11.7.31 Taking into account the local works required, the impact of constructing the new water supplies to the site is considered to be short-term, negligible.
11.7.32 In addition to the requirement for local works, given the quantum of development and absence of spare capacity in the immediate network, the water supply solution would require further work remote from the site. Thames Water has confirmed that these works would form part of their regulated network development enhancement.

11.7.33 The introduction of new supplies to the site is considered to be of long term local benefit since existing spare capacity is very limited and the reinforcement of the Thames Water network with increased availability of supply via new mains would provide a degree of enhancement.

**Foul Drainage**

11.7.34 Existing foul drainage is typically provided via combined sewers through and around the site in conjunction with some small diameter dedicated foul sewers that connect to the combined sewers.

11.7.35 The proposed drainage strategy is to separate storm and foul flows within the site and only to combine the discharges at the point of connection to existing sewers. The impact and assessment of the proposed storm water drainage options is included in the Water Resources Specialist report (Part 15).

11.7.36 As part of the work required in developing viable storm and foul drainage proposals for the site, Thames Water has been consulted. Hydraulic modeling has confirmed that the principle of “equivalent discharge” (i.e.: King’s Cross Central would not discharge at higher flows than the existing site) are acceptable to Thames Water. However, the King’s Cross Central proposals go further than this by committing to a 10% reduction in peak combined flows from completed development on the Main Site as set out in 3.40 of the Development Specification. In addition, a similar commitment has been made for the Triangle Site (para 3.26 of the Triangle Site Development Specification).

11.7.37 The Camden Sewer, which is a strategic combined sewer that would provide the main points of discharge for all foul sewage from the Main Site north of the Canal, passes within the site and behind the Granary building, under the Assembly Shed and the Eastern and Western Transit Sheds. Depending on the level of access that could be retained to the Camden Sewer, which would be a function of the eventual use of the Granary Complex, the sewer might need to be diverted to facilitate development. The diversion would relocate the sewer from north of the Granary building to Granary square as shown in Parameter Plan KXC 018. The principles of the diversion of the Camden sewer have been discussed and agreed with Thames Water Utilities, in the event it is considered necessary.

11.7.38 The Fleet Mainline sewer would provide the main points of discharge for the development south of the Regent’s Canal.

11.7.39 Foul sewage from the Triangle Site would discharge, independently from the Main Site, to an existing local combined sewer in York Way.

11.7.40 If the Camden Sewer is diverted from behind the Granary into Granary Square it would be beneficial. The diversion would remove a section of this strategic sewer from beneath existing listed buildings; this would ease future maintenance and access issues. The diversion would also include the removal of a local flow restriction thus reducing the risk of flooding within the King’s Cross Central site and thereby effectively increasing capacity.
of the sewer. This potential diversion would have no effect on existing or proposed foul drainage for the Triangle Site.

11.7.41 The impact of the diversion, if implemented, would be long term, moderate and positive.

11.7.42 During the construction of the diversion works, flows along the Camden Sewer may need to be very briefly interrupted to allow diversion of flows, although the majority of new construction would be off-line and therefore not affect existing flows. The impact of the diversion works during construction is considered to be short term, negative and minor.

11.7.43 Separate site foul drainage systems would be installed north and south of the canal within proposed road corridors. The systems would be designed to accommodate all sewage generated from the buildings and any other non-storm water flows e.g. car parks below ground level (in which case petrol interceptors would be provided prior to discharge to the foul sewer). The sewers would be designed in accordance with adoptable standards but may remain designated as private sewers.

11.7.44 Wherever possible, discharge from buildings and within the site would be via gravity sewers. This may not be possible everywhere, in which case lift stations and or rising mains would be provided.

11.7.45 The issues associated with the proposed foul flows from the site including quantum of discharge, capacity of existing pipes within and outside the site and capacity at the Beckton sewage treatment plant have all been discussed with Thames Water. Thames has identified that works are not required remote from the site and reinforcement is not required. Foul connections to existing pipes can generally be undertaken within the site boundary. The impact of these works during construction is considered to be short term and negligible since they would be unlikely to interrupt existing flows.

11.7.46 On the basis of the physical works required and the overall approach to storm and foul drainage discharge from the site, the impact of foul drainage construction works on the existing local network would be negligible. The impact of the operation of the site with respect to foul discharge is considered to be negligible since the flows would be within the overall quantity of flows currently being discharged.

Waste

11.7.47 In the main, waste would fall into either domestic or industrial and commercial waste categories for disposal. It is estimated, based on maximum possible residential and commercial floor space scenarios, that the development could generate up to some 1,800 tonnes per annum of domestic waste and up to some 21,500 tonnes per annum of commercial waste when fully developed at current rates of waste production. These are considered to be worst case in terms of domestic and commercial waste disposal, assuming that no recycling is carried out by any of the commercial waste producers.

11.7.48 Domestic waste would be collected and disposed of by the London Boroughs of Camden and Islington. To put this into context, the estimated 1,800 tonnes of domestic waste per annum is 1.85% of the total volume of domestic waste currently collected within the London Borough of Camden, and 1.94% of the total volume of domestic waste currently collected within the London Borough of Islington. In a wider context, it is 0.2% of the total volume of domestic waste currently collected within North London Waste Authority (NLWA) and 0.05% of the total volume of domestic waste currently collected
Current waste disposal techniques followed by the London Boroughs of Camden and Islington include, where feasible, kerbside collection of recyclable wastes (including cans, paper, glass and textiles) and collection of green waste and white goods. In addition, recycling centres are provided at appropriately located areas for the collection and recycling of a wide range of domestic waste streams (e.g. glass, cans, paper, cardboard, plastic, garden waste, batteries, oil, metal, clothes and computer equipment. The waste stream not suitable for recycling/recovery and the residual wastes from the recycling facilities are either sent to landfill or to Edmonton for energy recovery through incineration.

Industrial and commercial waste would be the responsibility of the building occupants and would be collected by appropriately licensed waste management companies. This would be managed and disposed of through the facilities that are available at the time. Waste disposal techniques currently adopted for disposal of industrial and commercial waste is dependent on the type of waste produced but may include the segregation and recycling of paper, cardboard and plastics. The majority of the remaining waste not suitable for recycling/recovery and any residue from the recycling facilities is sent to landfill for final disposal.

All waste management would be regulated by the requirements of the Environmental Protection Act 1990 Part II including the ‘Duty of Care’. The disposal of any hazardous waste would be regulated under the Special Waste Regulations 1996.

It is likely that between now and 2020, the ‘Design Year’, that waste disposal techniques would change, with potential for improvements in waste minimisation and recycling. Further steps could be taken to reduce waste generation (see further mitigation, section 11.8).

Communications

A variety of communications companies have been contacted. With the exception of BT, all have indicated that, at this stage, their policy is not to commit to new infrastructure investment. In the absence of their own dedicated infrastructure to serve the site they have suggested that if particular customers (tenants) request supplies, they would seek means to provide that service through either:

- Installing additional ducts and chambers where required; or
- Leasing ducts from other parties.

BT has significant infrastructure around and, to some extent, within the site. The points of BT connection to the site may be via Euston Road to the south, and via York Way at the junction immediately north of the Regent’s Canal, and at the northern end of the site. The requirements for any reinforcement would be identified as and when spare capacity is utilised.

The BT telephone exchange(s), from which some telecommunication cables/optical fibres would be sourced, would be determined following a detailed investigation by the telecommunication network provider when an order is placed. At this stage BT has identified several exchanges within the proximity of the site that would have sufficient spare capacity to supply the number of lines that may be required. A diverse supply
would be obtained by connecting back to at least 2 different exchanges. Connections back to these existing exchanges would be typically via existing ducts but possibly via new cables.

11.7.56 Taking into account the presence of existing telecom ducting but the likelihood that in sections these ducts may need to be supplemented with new ducts dependant on the number and congestion of cables, the impact of telecommunications work is considered to be short-term, local and negligible.

11.7.57 Within the site a combined multi-way duct bank would be provided but with multiple chambers to provide appropriate access and security. These duct routes would be located within the road/infrastructure corridors. The impact of telecommunications work within the site is considered to be negligible but would be long term since new supplies would be provided throughout the 15 year development period.

11.7.58 The operation of the new communication services within site is also considered to have a negligible impact on existing and proposed services.

**General**

11.7.59 As phases of the development are built out, the on-site utility network would be expanded to suit. This may require connection to existing services within earlier phases and could cause ongoing minor disturbance to the residents and users of the site. This would be managed as a normal part of phased development operations. The measures identified above for off-site works would also be appropriate for use on-site, in most circumstances.

**Summary**

11.7.60 Table 11.2 below summarises the result of the assessment of impacts from the development on urban services.

**Table 11.2: Summary Table Of Impacts**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Summary Description</th>
<th>Duration of Impact</th>
<th>Significance of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diverting existing utilities in local roads</td>
<td>To allow new road connections from site to tie into existing highway network</td>
<td>Medium term</td>
<td>Negative Minor</td>
</tr>
<tr>
<td>Providing new utility supplies from off site locations to the site</td>
<td>New supplies along existing road and footpaths could restrict tree planting and disrupt as a result of maintenance requirements</td>
<td>Long term</td>
<td>Negative Minor</td>
</tr>
<tr>
<td>Trenching through potentially contaminated ground</td>
<td>When excavating trenches onsite for utilities there is a risk of encountering contaminated ground</td>
<td>Short to medium term</td>
<td>Negligible</td>
</tr>
<tr>
<td>Impact</td>
<td>Summary Description</td>
<td>Duration of Impact</td>
<td>Significance of Impact</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Use of imported granular fill</td>
<td>Bedding and surround material for installation of services onsite</td>
<td>Medium term</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

**POWER**

<table>
<thead>
<tr>
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<th>Duration of Impact</th>
<th>Significance of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>New power supplies to the site</td>
<td>Provision and quantum of new power supplies provides the potential for further enhancement to serve other developments</td>
<td>Long term</td>
<td>Positive Minor</td>
</tr>
<tr>
<td>New power supply from City Road (construction)</td>
<td>Laying of new 132kV cables in public roads. Estimated installation time is 1-year</td>
<td>Medium term</td>
<td>Negligible</td>
</tr>
<tr>
<td>New power supply cables from Longford Street (construction)</td>
<td>Laying of new 11kV cables in public roads. Estimated installation time is 6-months to 1-year</td>
<td>Short term</td>
<td>Negligible</td>
</tr>
<tr>
<td>Utilising power supply from Longford Street</td>
<td>Using existing spare capacity from supply the site</td>
<td>Long term</td>
<td>Negative Minor</td>
</tr>
<tr>
<td>Utilising power supply from City Road</td>
<td>Electricity taken from a bulk supply point with significant spare supplies</td>
<td>Long term</td>
<td>Negligible</td>
</tr>
<tr>
<td>Construction of Sub-station on site (construction)</td>
<td>Sub-station installed in site boundary as part of 1st Major Phase</td>
<td>Short to medium term</td>
<td>Negligible</td>
</tr>
</tbody>
</table>
| Operation of primary substation on site | The effect on other utilities of operating and distributing electricity around the site at 11kV  
*Refer to other chapters for interactive effects* | Long term | Negligible |

**FOUL**

<table>
<thead>
<tr>
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<th>Duration of Impact</th>
<th>Significance of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>New foul water discharge points (construction)</td>
<td>Additional/replacement/existing connections from the site to the public combined sewer in public roads</td>
<td>Short term</td>
<td>Negligible</td>
</tr>
<tr>
<td>New foul flow discharges from the site</td>
<td>Increased foul flows within an overall combined flow not exceeding existing flows. (A 10% reduction of overall peak flow discharge (foul and storm) from the Main Site is proposed).</td>
<td>Long term</td>
<td>Negligible</td>
</tr>
<tr>
<td>Impact</td>
<td>Summary Description</td>
<td>Duration of Impact</td>
<td>Significance of Impact</td>
</tr>
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<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Separation on site of storm and foul flows</td>
<td>Separate storm and foul sewers on the site provide future flexibility for separating flows off site thus reducing impact of foul sewer overflows</td>
<td>Long term</td>
<td>Positive Minor</td>
</tr>
<tr>
<td>Construction of Camden Sewer Diversions</td>
<td>Re-routing of existing large diameter pipes</td>
<td>Short term</td>
<td>Negative Minor</td>
</tr>
<tr>
<td>Operation of diverted of Camden Sewer, if implemented</td>
<td>Removal of sewer beneath existing buildings</td>
<td>Long term if implemented</td>
<td>Positive Moderate if implemented</td>
</tr>
<tr>
<td>Reduced peak combined flows to Camden Sewer</td>
<td>A 10% reduction of overall peak flow discharge (foul and storm) from the Main Site (NB Also 10% reduction in peak flow discharge (stormwater) from Triangle Site to the Mid Level Sewer)</td>
<td>Long term</td>
<td>Positive Minor</td>
</tr>
</tbody>
</table>

**WATER SUPPLY**

| New water supply connection via Coach Road (construction)              | 1200m length of new 450mm diameter supply pipe to enter site via Coach Road and Royal College Street                                                                                                             | Short term        | Negligible             |
| New water supply connection via Copenhagen Street (construction)       | 400m length of 450mm diameter supply pipe to the site from the existing main in Caledonian Road, via Copenhagen Street                                                                                           | Short term        | Negligible             |
| Operation of new supplies                                              | Enhancement of existing local network provides the opportunity for others                                                                                                                                       | Long term         | Positive Minor         |
| Quantum of new potable supplies to the site                            | Limit new supplies and off site works required to those absolutely necessary and thereby ensure a sustainable approach to water supply                                                                       | Long term         | Positive Minor         |

**GAS**

<p>| Relocation of gas governor and associated mains (construction)         | 200m length diversion of 2 No. 900mm LP gas mains and 350m length of 1 No. 900mm MP gas main                                                                                                                      | Medium term       | Negative Minor         |
| Operation of relocated gas governor                                     | Same impact as existing gas governor                                                                                                                                                                         | Long term         | Negligible             |</p>
<table>
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<th>Significance of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>New off-site gas connections (construction)</td>
<td>Connections to existing mains in York Way at two locations</td>
<td>Short term</td>
<td>Negligible</td>
</tr>
<tr>
<td>Additional gas consumption as a result of development</td>
<td>Operation of new gas supplies to the site via new connections to the low pressure network</td>
<td>Long Term</td>
<td>Negligible</td>
</tr>
</tbody>
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**COMMUNICATIONS**

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<tbody>
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<td>Limited reinforcement of the existing comms duct network off site (construction)</td>
<td>Laying new ducts along existing roads and footpaths</td>
<td>Short term</td>
<td>Negligible</td>
</tr>
<tr>
<td>Installation of additional comms cables within the site along previously installed ducts (construction)</td>
<td>Lifting of chamber covers and providing additional comms cables</td>
<td>Short term</td>
<td>Negligible</td>
</tr>
<tr>
<td>Operation of additional comms services to the site</td>
<td>Utilisation of existing capacity at the telephone exchanges</td>
<td>Long term</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

**WASTE**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Summary Description</th>
<th>Duration of Impact</th>
<th>Significance of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposal of municipal and commercial/industrial waste</td>
<td>Municipal waste would be collected and disposed of by the London Boroughs of Camden and Islington. Disposal of commercial/industrial waste would be the responsibility of individual occupiers and would be carried out by contractors.</td>
<td>Long term</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

**Effects without the Triangle Site**

11.7.61 The impact of removing the Triangle Site development would have a negligible effect on the quantum of utility demand, typically in the range of a 1-4% reduction. This would not have any material effect on the off site reinforcement works but would avoid the need for minor utility building connections from supplies in York Way or across York Way from the site, and also discharging foul flows to the local York Way combined sewer. It is considered that the removal (or delay) of these works would not affect the overall assessment findings.
Effects with LUL Phase 2 and Kings Cross Station Enhancement

Effects at the Construction Stage with LUL Phase 2 and King's Cross Station Enhancement

11.7.62 The ongoing LUL Phase 2 works (Northern Ticket Hall and associated infrastructure) are due to be complete by 2007 but are the subject of a current review that may affect the timing of their completion. It is possible, therefore, that the works to complete the project (scheduled to last 3 years) could still be underway in 2007, alongside the development of King's Cross Central.

11.7.63 If the King's Cross Station Enhancement proposals go-ahead, there is a range of possible timescales, including the following:-

a) construction could commence following completion of the LUL Phase 2 (Northern Ticket Hall etc) works with construction of the Station Enhancement expected to last a maximum of 4 years; or

b) the proposals for King's Cross Station Enhancement could be combined with the LUL Phase 2 (Northern Ticket Hall) into an integrated project, with construction of that integrated project likely to take less than the 7 years identified above for the two projects to take place one after the other.

11.7.64 It is considered unlikely that an integrated project ((b) above) would have greater overall construction effects (in terms of either magnitude or duration) than the two projects carried out in sequence, one after the other: if anything an integrated project is likely to have less construction effects in terms of magnitude and duration. This assessment for urban services has therefore considered (a) above (construction of King's Cross Station Enhancement following completion of the LUL works) and the potential for it to give rise to cumulative construction effects alongside King's Cross Central. In order to assess the potential 'worst case', this assessment has considered what the effects would be if the peak construction activity from King's Cross Central coincided with the peak construction activity from LUL/ King's Cross Station Enhancement.

11.7.65 The construction of LUL Phase 2 works and King's Cross Station Enhancement would require significant levels of coordination of both above and below ground works. However utility supplies to the schemes are considered at this stage to be independent from each other. If the LUL Phase 2 and King's Cross Station Enhancement projects were to become one integrated project, the utility supplies would still be independent from King's Cross Central. Therefore, other than the physical coordination of the below ground utilities, the effect of LUL Phase 2 and Kings Cross Station Enhancement should not affect the utility strategy or works. The worst case would be some diversionary works; the impact would be negligible.


Effects at the Operational Stage with King’s Cross Station Enhancement

11.7.66 The introduction of enhancement works to Kings Cross Station at the southern end of the site would require significant levels of coordination of both above and below ground works. However utility supplies to the two schemes are considered at this stage to be independent from each other. Therefore, other than the physical coordination of the below ground utilities, the station enhancement works are unlikely to affect the operation of King’s Cross Central urban services. The worst case would be some diversionary works. Any impact would be negligible.

11.8 Opportunities for further Mitigation Measures

General – Off-Site

11.8.1 For all urban services the most significant direct impacts would be as a result of the off-site works. It is recommended that all new work, diversion works and reinforcement along the same road be coordinated, perhaps as part of a multi utility installation where appropriate, so that wherever possible the work would be carried out at the same time using common trenches, logically sequenced where trench sharing would not be feasible. Reducing the number of excavations would reduce the potential for accidental damage and interruptions to existing utilities.

11.8.2 Utility providers are already aware of several other significant proposed developments within North London and are likely to be required to provide additional resources to address the associated future utility demands. A strategic review of all existing utilities by the respective utility companies may result in identification of opportunities for further upgrades or enhancements of utility supplies that would avoid future disruption along the proposed routes.

11.8.3 All utility companies could consider the use of economic alternatives where appropriate in order to mitigate the impact of the works proposed.

11.8.4 As phases of the development are built out, the on-site utility network would be expanded to suit. This may require connection to existing services within earlier phases and could cause ongoing minor disturbance to the residents and users of the site. The above measures identified for works off-site would also be appropriate for use on site in most circumstances.

Power

11.8.5 Advanced technical solutions would be considered when providing new electrical infrastructure. These may further reduce any residual impact of providing new power supplies to the site. For example, cross-linked polyethylene cables are a relatively new form of extra high voltage cable construction that avoids the need for oil-cooled cables, which remove the risk of spillage or leaking of oil.

11.8.6 The proposed buried EDF Energy 132kV cable routes would require easements and vehicular access to be maintained at all times. The location of the cables may be beneath road carriageway or footways and where appropriate the corridor above the cables could be grassed over but no trees or buildings would be able to be positioned directly within the cable corridor. This has been taken into account in preparing the Landscape
Proposals Plans. Detailed coordination of the route both in and off site may allow the impact of the cables, where not placed under roads or footpaths, to be further reduced in order to allow further opportunities for future tree planting, etc.

11.8.7 The further expansion of the proposed on site sub-station would provide the opportunity for electricity distribution companies to invest in future capacity for new developments outside King’s Cross Central and for general load growth in the area. This would provide some long term moderate benefit if spare capacity were available for other sites.

11.8.8 Designing buildings within the development to achieve the applicants’ stated targets of reducing carbon emissions by as much as to 25% below those specified by the current Building Regulations (2000), following the Energy Hierarchy of applying energy efficiency, then renewable energy and then optimising efficiency of supply, would reduce the demand on the existing and new power supplies.

**Potable Water**

11.8.9 Thames Water Utilities could consider the option of relining pipes rather than installing new pipes to supply the site if appropriate. This is a potentially quicker method and reduces the need to open up trenches in existing roads.

11.8.10 Thames Water Utilities could consider the reduction in leakage from existing pipes off site and throughout London as a more sustainable approach to generating additional capacity within their system in conjunction with expanding and increasing the network to supply the site.

11.8.11 The feasibility of integrating aspects of SuD’s including rainwater harvesting and grey water recycling could be examined further by means of feasibility/viability studies at the detailed design stage for specific zones/plots, as they come forward.

11.8.12 The use of an on-site borehole to reduce potable demand for irrigation purposes could be considered. This would be subject to the assessment of impact and the consent of the Environment Agency, under regulatory procedures.

**Waste**

11.8.13 Various mechanisms to reduce waste could be introduced including encouraging re-use, and making recovery of waste possible by providing easily accessible facilities for commercial and household recycling and composting.

**Telecommunications**

11.8.14 Managing the ducts can prevent repeated and unnecessary lifting of covers to remove or pull new communication lines. The role of managing and regulating the on-site duct network could be conducted by an estate management company.
11.9 Monitoring

11.9.1 The impacts associated with the construction of on site utilities would be monitored in accordance with the techniques as specified in Part 4, Construction Effects.

11.9.2 Off site works would be carried out by the relevant statutory undertakers, in accordance with the NRSWA, and following of their own operating procedures.

11.10 References

Department for Environment, Food and Rural Affairs website, May 2003, Capital Waste Facts

Environmental Protection Act, 1990

Special Waste Regulations, 1996, SI972

The Building Regulations, 2000, SI2531
King’s Cross Central

Environmental Statement

Volume 3: Part 12 Socio-economic Specialist Report

Prepared for Argent St George, London and Continental Railways and Exel by Arup

May 2004
Part 12 Socio-economic Specialist Report

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12 Socio-economic Specialist Report

12.1 Introduction

12.1.1 This report, together with the specialist report on health effects (Part 13), sets out an assessment of various positive and negative impacts on people. It considers the issues that are likely to be most important in bringing about economic and social change to the King's Cross area. In doing so, it distinguishes between the social and economic needs of existing communities now, and the potential impacts that may arise from the development and its ‘users’.

12.1.2 It is clear that no single development would be able to address all of the regeneration objectives and aspirations of local communities. A development that helps achieve the optimum social and economic transformation of the area would require partnership and commitment from a wide range of stakeholders to achieve the successful integration of existing and new communities.

12.2 Methodology and Assessment Criteria

Introduction

12.2.1 The methodology involves the following stages:

- Baseline (including description and evaluation);
- Identification of predicted effects for the ‘worst case’ scenario;
- Assessment of significance; and
- Identification of further opportunities for mitigation.

12.2.2 The methodology takes account of the advice set out in the DoE Good Practice Guide (DoE, 1995), and in particular, Appendix 1. It also draws on guidance provided by Circular 02/99 and the Town and Country Planning (Environmental Impact Assessment) Regulations 1999.

12.2.3 At its most basic level it considers effects on the population, housing and services. However, in recognition of the complex combination of issues that contribute to social and community development in King’s Cross, the assessment also considers impacts on:

- young people, schools and education services – drawing on findings of the consultation work undertaken with over 200 young people to support the applicants’ ‘Framework’ consultation document in 2002;
- crime and community safety;
- employment and competitiveness in labour markets;
- business growth;
- community capacity and support services; and
12.2.4 To gain a clear understanding of the scale and nature of potential socio-economic needs, published statistical information and bespoke research sources (including those provided by the King’s Cross and Camden Central Partnerships and Camden and Islington Neighbourhood Renewal Strategies) have been used to establish existing local conditions. These form the basis of projections to establish a baseline position in 2006/2007 and a measure of the possible changes over the development period (to an assumed Design Year of 2020).

12.2.5 The assessment is based on the proposed development land uses and floorspace set out in the Planning Applications. The role for and effect of additional policy, regeneration and labour market interventions that might further increase employment and other benefits for local people are discussed in the further mitigation section of this report.

12.2.6 The assessment follows similar approaches adopted for recent large-scale schemes such as the Stratford Rail Lands and Greenwich Peninsula. It draws on guidance from English Partnerships (2001, 2002), The Greater London Authority (2002a, 2002b, 2003), and HM Treasury ‘Green Book’ (2003).

12.2.7 In particular, the approach seeks to identify likely direct employment and indirect employment arising from the scheme as a whole. It also identifies local employment impacts (jobs taken by residents) in two defined zones: the Central Impact Zone and Wider Impact Zone. The definition of these zones is explained in 12.2.9. Total employment generation is calculated by incorporating deadweight, displacement and multiplier effects in the analysis. These terms are explained in Figure 12.1.

12.2.8 In addition, local Council and other sources have been used to assess the current capacity of local services to accommodate the new population and activities which would be introduced by the development. These are used to provide an understanding of current service levels and gaps in provision to existing communities. With the support of consultation with key service providers, these also form the basis for 2006/2007 Baseline projections and identify the services which may be most affected by increased population and social and economic change. The assessment identifies where new or enhanced provision may be required to serve the new community and considers the potential benefits of upgrading/extending existing facilities in the surrounding area as well as providing new facilities on site.

**Area of Study**

12.2.9 Using the statistical and research evidence available, three geographic areas of impact have been defined:

- the King’s Cross Central site – the area within both the application ‘red lines’ where new communities would be expected to live and work whilst construction of later phases continues alongside – the ‘users’ of the development;

- the Central Impact Zone – where the challenge would be to integrate the new development with existing neighbourhoods and communities, physically, economically and socially. It is also where the main opportunities exist to spread regeneration benefits and where adverse effects (e.g. from construction) may arise. The area has been defined by the following Camden and Islington wards: Caledonian, King’s Cross, St Pancras and Somers Town;
the Wider Impact Zone – largely defined by ‘needs based analysis’ and wider area regeneration programme coverage. The area has been defined by the following Camden and Islington wards: Barnsby, Bloomsbury, Clerkenwell, Cantelowes, Holborn and Covent Garden, Holloway and Regent’s Park.

Effects with LUL Phase 2 and King’s Cross Station Enhancement

12.2.10 Whilst the concurrent development of the King’s Cross Station Enhancement proposals might have effects on other topics in the EIA, it is unlikely that it would significantly alter the socio-economic effects of King’s Cross Central. The only exception may be in the generation of construction jobs, but at this stage it is not possible to determine the scale of employment the station proposals might generate. Therefore it has been assumed that the station proposals have no effect on the socio-economic impacts of King’s Cross Central.

Measuring the Significance of Impacts

12.2.11 The scale of impacts from the development proposals on people would be closely linked to a variety of social and economic conditions outside the developer’s control. For example, an unemployed person may be unable to obtain a job for a variety of reasons, including lack of skills, caring obligations, disability, lack of confidence or criminal record. Even through actively supporting intervention measures, the developer would only be able to influence a small number of these issues. The leadership and active involvement of the Local Authorities, health services, police and other service providers would be required to address the full combination of issues. Nonetheless it is important that the development does not have significant adverse effects on current socio-economic conditions and if possible, provides opportunities to improve them.

12.2.12 King’s Cross Central would introduce a wide range of physical, social and economic opportunities to an area that is currently amongst the most deprived in the UK. By bringing a large underused site at the heart of these deprived communities back into full economic use King’s Cross Central is likely to result in net social and economic benefits. Many of these may be enhanced further through additional targeted social or economic intervention. There are also likely to be negative impacts within the overall context of a net gain. The people that gain from some aspects are not necessarily the same people that are negatively affected by other aspects. Therefore the assessment has regard to the number of people affected as one measure of the significance of effects. Table 12.1 indicates the different sizes of population considered.

Table 12.1 Population Based Significance Measures

<table>
<thead>
<tr>
<th>Population Affected</th>
<th>Significance of Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small number of individuals spread across the impact area.</td>
<td>Negligible</td>
</tr>
<tr>
<td>Specific community living in a particular geographic location (e.g. a particular street or neighbourhood) or belonging to a specific demographic, socio-economic or other interest group (such as people under the age of 3 years, the unemployed or private rented sector residents).</td>
<td>Minor</td>
</tr>
<tr>
<td>Population living in the Central Impact Zone</td>
<td>Moderate</td>
</tr>
<tr>
<td>Population living in the Wider Impact Zone</td>
<td>Major</td>
</tr>
</tbody>
</table>
Table 12.2 provides examples of differing levels of potential impacts and their significance for particular circumstances.

Table 12.2 Examples of Significance Measures

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Population Affected</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rising rents make the area unaffordable for current residents</td>
<td>Small private rental sector.</td>
<td>Minor negative</td>
</tr>
<tr>
<td>Local businesses displaced by new companies in King’s Cross Central</td>
<td>Small number of businesses likely to be in competition with new uses.</td>
<td>Minor negative</td>
</tr>
<tr>
<td>Existing health centres become oversubscribed to meet needs of new residential/business population</td>
<td>Large number of local residents rely on local health services.</td>
<td>Major negative</td>
</tr>
<tr>
<td>Existing open spaces become overcrowded due to demands of new local residents/workers</td>
<td>Open spaces used selectively by existing population.</td>
<td>Minor to Moderate negative depending on existing use of open space</td>
</tr>
</tbody>
</table>

12.3 Consultations

12.3.1 Information for this assessment was gathered from a wide range of sources and combined interviews with local community groups, discussions with relevant Council and GLA departments and a review of existing publications. It also included first hand research where gaps in information were identified. The following responses were received from Camden Council in response to the Consultation Draft Environmental Assessment Scoping Report:
<table>
<thead>
<tr>
<th>Comment from London Borough of Camden</th>
<th>Response to Comment</th>
<th>Comment Addressed in Section of Report</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proposed Assessment Methodology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Report provides a sound basis for a thorough assessment of the Socio-economic impact of the Kings Cross Central development. However, it is unclear if the future analysis will look at each issue from a site, Central Impact Zone (CIZ) and Wider Impact Zone (WIZ) perspective. If not, then the Council strongly advocates this approach.</td>
<td>Agreed – future analysis will examine impacts at all three geographic levels.</td>
<td>The analysis of impacts is conducted at the three geographic levels recommended.</td>
</tr>
<tr>
<td>Paragraph 10.9 should also include:</td>
<td>Agreed</td>
<td></td>
</tr>
<tr>
<td>- Job creation and retention;</td>
<td></td>
<td>Job creation and open spaces are specifically assessed in this report in section 12.6. A number of impacts of retail uses are also assessed (such as employment generation) but retail impacts on viability and vitality of other retail uses and centres are not EIA issues. They are addressed within the retail impact report submitted with the planning applications.</td>
</tr>
<tr>
<td>- Retailing; and</td>
<td></td>
<td>The retail impact assessment concludes that King’s Cross Central would not have a significant adverse effect on the viability and vitality of other centres.</td>
</tr>
<tr>
<td>- Open spaces, leisure and recreations.</td>
<td>Agreed</td>
<td></td>
</tr>
<tr>
<td>In addition, the fourth bullet point should be changed to read ‘business creation’ retention and growth’.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Assessment of Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With regard to Paragraph 10.14, we would anticipate that the study consider ‘best practice’ from other major regeneration developments such as Paddington, CTRL works, Millennium Dome and Cardiff Bay. The London Development Agency is producing a significant amount of relevant research material that the Environmental Statement should draw evidence from e.g. DTZ Pieda Kings Cross/St Pancras Construction Study</td>
<td>Agreed – the ES will draw on examples of good practice and consider the DTZ Pieda Kings Cross/St Pancras Construction Study.</td>
<td>Where possible the report draws from a variety of comparative developments and research conducted on other schemes (including the King’s Cross Construction Training Centre research referred to in the DTZ Pieda Report), these are referenced throughout.</td>
</tr>
<tr>
<td><strong>Identification of Possible Effects</strong></td>
<td>Agreed</td>
<td></td>
</tr>
<tr>
<td>The following benefit should be added to Tables 10.1 and 10.2:-</td>
<td></td>
<td>The issues raised are specifically addressed in sections 12.6 and 12.7 of this report, with the exception of retail impact on the viability and vitality of other centres – see above.</td>
</tr>
<tr>
<td>- increased opportunities for local training, recruitment and employment’.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Account should also be taken of any possible adverse retail effects.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Similarly, mitigation measures for crime, unemployment and social isolation / alienation should be investigated.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12.4 The Existing Situation

Introduction

12.4.1 A profile of current social and economic conditions has been compiled using a combination of published statistical sources and bespoke research. Where possible, the data used has been disaggregated to ward or smaller geographic level. Data used includes:

- ONS Census 1991 and 2001 population projections;
- Annual Census of Employment 2000;
- DfES school league tables 2003;
- DETR Index of Multiple Deprivation 2001;
- ONS Neighbourhood Statistical Service;
- Mayor of London publications – Planning for London’s Growth (GLA, 2002e); Private Sector Rents Bulletin (winter 2002-03);
- LB Camden Housing Strategy 2001-05;
- LB Camden, Early Years Development and Childcare Plan 2001-04;
- Camden Schools Organisation Plan (draft) 2003-08;
- Islington Schools Organisation Plan 2003-08;
- GLA Focus on London (2003);
- GLA Economics, Market Failure and the London housing market (GLA, 2003b); and
- Childcare Link.

12.4.2 The London Boroughs of Camden and Islington, with their partners in the Metropolitan Police and Health Service, regularly gather detailed information about their local areas. In addition, the King’s Cross and Camden Central Partnerships have undertaken research into specific social or economic issues including access to employment, local skills audits and community asset audits. Whilst this information is not always comparable to other studies, it provides a useful baseline and reflects accepted methodologies in compliance with central government advice.

Multiple Deprivation

12.4.3 The Index of Multiple Deprivation 2000 is made up of six domains representing employment, income, education, health, housing and access. Within the Wider Impact Zone:

- eight wards in the area are amongst the worst 10% in England on ‘income’ indicators;
- the same eight wards are within the worst 10% on ‘employment’ indicators;
- three wards in the area are amongst the worst 5% on ‘community health’ indicators;
- six wards are within the worst 25% on ‘education’ indicators;
12.4.4 Ten of the twelve wards (2001 ward boundaries) in the combined Central and Wider Impact Zones are ranked within the 20% most deprived in England (Index of Multiple Deprivation, 2000). The following four wards in the Central Impact Zone are amongst the 10% most deprived in England:

- Somers Town - within the 5% most deprived
- Holloway - within the 10% most deprived
- Thornhill - within the 10% most deprived
- Kings Cross - within the 10% most deprived

12.4.5 The King’s Cross Central development would provide an opportunity to address some of the socio-economic factors that contribute to local deprivation.

Demographics

12.4.6 The Central Impact Zone currently has a population of approximately 35,470 people in 14,846 households. The population of the Wider Impact Zone is approximately 73,580 in 33,925 households (ONS, 2001). Accordingly, the Central and Wider Impact Zones have population densities of approximately 2.39 and 2.17 people per household (pph). This is marginally higher than the Camden and Islington average of 2.15 pph.

12.4.7 The combined Central and Wider Impact Zones have a similar age profile to other Central London locations with around 17% of the population aged under 16, 69.5% aged 16-59, and 13.5% aged 60 or over. In the wards of the combined Central and Wider Impact Zones, young adults (16-24) constitute an average of 17.6% of the population (note however that this includes UCL student accommodation in Bloomsbury). In both the Central Impact Zone and the Wider Impact Zone, there are slightly more females than males.

Ethnicity

12.4.8 At present, the Central and Wider Impact Zones have considerable ethnic diversity, and this has been increasing during the past decade. In particular, Kings Cross ward has the largest proportion of ethnic minority residents of any of the wards within the Central or Wider Impact Zones wards, with those classified as white British constituting only 37.2% of the population.

12.4.9 As a proportion of the total ward populations, the principal ethnic minority groups in the Central Impact Zone are: Bangladeshi (over 15% of both Kings Cross and St Pancras & Somers Town wards, over three times the Inner London average, and 4.8% of Caledonian ward, twice the Islington average); African (10.9% of St Pancras & Somers Town ward); Chinese (3.8% of Caledonian ward, over twice the Islington average) and Indian (3.34% of Kings Cross ward, compared with the Camden average of 2.31%) (ONS, 2001).

12.4.10 The groups which have experienced the greatest proportional increase in population numbers in the Central Impact Zone since the 1991 census are the Bangladeshi, black (including African and Caribbean) and Chinese populations. In the Wider Impact Zone, a
similar picture emerges, with an increasingly diverse population, although the Indian population has decreased by two thirds (decreasing from 4,890 to 1,615 in the period 1991-2001). This may be explained, to some extent, by ward boundary changes in 2001.

12.4.11 Associated with this level of ethnic diversity is a correspondingly high level of religious diversity. Compared with the Inner London average, the Central Impact Zone has fewer Christians and almost twice as many Muslims. Currently around 22% of both Kings Cross and St Pancras & Somers Town wards are Muslim, contributing to a total of around 6,600 people within the Central Impact Zone as a whole (ONS, 2001). This has significant implications in terms of family and household size, demand for community facilities and places of worship as well as potential access to employment.

Employment

12.4.12 In 2000, there were 50,710 employees working in the Central Impact Zone area, and a further 198,000 in the Wider Impact Zone. Banking and finance dominates the employment sectors (28.8% 14,604 Central Impact Zone), along with public administration, education and health (25.1% Central Impact Zone 12,678) and distribution and retailing (18% 9,128 Central Impact Zone).

12.4.13 In 2000 a lower proportion of residents in the Central and Wider Impact Zones were employed in the construction industry than the averages for England and London. The construction industry accounts for 3.4% and 2.7% of residents in employment in the Central (1,724 jobs) and Wider Impact Zones (5,346 jobs) respectively. This compares with a national average of 6.8% and London average of 5.3% and highlights a significant potential sector for local employment growth.

12.4.14 The 2001 Census reported that there were 15,112 ‘economically active’ people living in the Central Impact Zone (N.B. this includes self-employed, short-term unemployed and full-time students with jobs). This equates to 55.9% of all 16-74 year-olds in the Central Impact Zone. 10,422 of these people were working, of which 8,597 (82.5%) worked full-time and 1,825 (17.5%) worked part-time.

12.4.15 In the Wider Impact Zone, there were a total of 35,905 ‘economically active’ people. This equates to 61.6% of all 16-74 year-olds in this area. There were 25,006 employees (other economically active people work for themselves or for unregistered organisations), of which 21,384 (85.5%) worked full-time and 3,622 (14.5%) were part-time (ONS, 2001).

12.4.16 Table 12.3 below compares these figures with the London average. It is clear that communities in both the Central and Wider Impact Zones display significantly lower levels of economic activity than London as a whole.
### Table 12.3 Employment Levels in the Central and Wider Impact Zones

<table>
<thead>
<tr>
<th>Economically Active</th>
<th>Central Impact Zone</th>
<th>Wider Impact Zone</th>
<th>London Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economically active as proportion of total 16-74</td>
<td>55.9%</td>
<td>61.6%</td>
<td>67.5%</td>
</tr>
<tr>
<td>Full time employees as proportion of total 16-74</td>
<td>31.8%</td>
<td>36.7%</td>
<td>42.6%</td>
</tr>
<tr>
<td>Part time employees as proportion of total 16-74</td>
<td>6.7%</td>
<td>6.2%</td>
<td>8.6%</td>
</tr>
</tbody>
</table>

12.4.17 A greater proportion of women work part time in the Central Impact Zone (8.4% of female population 16-74) than in the Wider Impact Zone (7.9%) (ONS, 2001). An additional 1,802 women in the Central Impact Zone (13.4% of 16-74 year olds) are considered economically inactive due to domestic commitments, looking after their home, family or other dependants.

12.4.18 Using the DTLR Census Matrix Tool (which analyses 1991 Census Derived ‘travel to work’ data), only an estimated 3% (7,649) of all employees working in the Central Impact Zone travel to work in the area from the Central Impact Zone wards. This suggests that local employment rates are low. The high accessibility of the area makes the employment market very competitive and further analysis has shown that people travel daily from every borough in London to work in the Central Impact Zone. Whilst the highest proportions are from neighbouring areas in Camden (1,812 people – 7%) and Islington (2,588 – 10%) others travel longer distances, from Lambeth (1,067 – 4%), Haringey (1,759 – 7%) and Brent (1,081 – 4%).

12.4.19 A survey of employment on site undertaken for the CTRL project in 1998 estimated then that there were 600 jobs on the King’s Cross Central site. It estimated that 400 of these would be permanently displaced by CTRL works leaving 200 jobs on-site. These businesses range from light manufacturing to film production and editing. Most are on short leases that reflect the site’s status as awaiting development. In addition there are an estimated 65-100 jobs within the concrete batching plant and Camden depot located on the northern parts of the former rail lands. These facilities are moving outside the boundary of the King’s Cross Central proposals and no displacement of employment is expected.

### Unemployment

12.4.20 The number of claimants in the combined Central and Wider Impact Zones has shown a downward trend in the past five years, broadly consistent with that of London as a whole. Figure 12.2 shows the trends in claimant counts for the Central and Wider Impact Zones between 1999 and 2003.

12.4.21 Comparison of the August 2003 claimant count with estimates of the economically active population suggests an unemployment rate in the Central Impact Zone of between 12% and 13%. The London average is around 5%.
12.4.22 Figure 12.3 shows the proportion of people claiming unemployment benefit in the Central and Wider Impact Zones. These figures conceal ‘real’ unemployment, excluding 16-18 year olds and others who cannot, or do not register as unemployed (probably raising the total figure to around 15-20%). The former King’s Cross Partnership estimated real unemployment amongst ethnic minority groups to be around 25% (Bangladeshi 34%) in 2001.

Income

12.4.23 Income levels amongst residents in the Central and Wider Impact Zones fall below the London average, with high income support dependency and low incomes. In 2002/03, the Central Impact Zone had 66% more households living on incomes in the lowest bracket (£0 – £5,000) than the average for London. A significant proportion (56%) of households in the Central Impact Zone had a total income of less than £25,000, compared with 35% of households in London as a whole (CACI, 2003).

12.4.24 Factors limiting a person’s income relate to education and skills, employment opportunities and dependence:

- the provision of education and skills is variable. School performance was low but is generally increasing, while skill levels are low, particularly in the Central Impact Zone;

- geographical distance to employment opportunities should not be a limiting factor in the Central Impact Zone or Wider Impact Zone as the area is located in one of the most accessible locations in London and the country;

- high levels of dependence amongst local communities restrict local employment levels; the Central Impact Zone contains a high proportion of people who look after their children or other dependants, as indicated in Figure 12.4. This limits opportunities for income sources. This is particularly noticeable in the St Pancras and Somers Town ward in which 10% of the economically active population look after the home and family, in comparison to 7% for London as a whole. Levels of dependence in the Wider Impact Zone are similar to the London average (ONS, 2001), although Figure 12.5 indicates the number of people in the Wider Impact Zone who spend more than 20 hours a week in unpaid care is higher than the London average. The effect of dependence on income is also reflected in Figure 12.4 - the proportion of lone parents who are in part or full time employment is lower than the London average.

Housing

12.4.25 Housing tenure in the Central and Wider Impact Zones is markedly different from London as a whole, containing high proportions of public housing and low proportions of open market housing. In the Central Impact Zone, the 2001 Census reported that 40% of households live in housing rented from the Council and 18% in housing rented from Housing Associations. The Wider Impact Zone has similar characteristic with 35% and 15% of households in Council and Housing Association houses respectively. These are significantly higher than the London average of 17% and 9% for Council and Housing Association housing respectively (ONS, 2001). One effect of such tenure characteristics is to impede the negative socio-economic effects of rising house prices on low income
households, as there is little open market housing affected and social housing rents remain linked to levels defined by the Local Authorities and the Housing Corporation.

12.4.26 Lack of available good quality affordable housing is a persistent problem across Inner London, and the Kings Cross area is no exception despite the preponderance of public and Registered Social Landlord (RSL) stock identified above. All of the wards in the immediate vicinity of Kings Cross fall within the worst 5% in England in terms of poor housing conditions. To a large extent, this reflects conditions within the stock of privately rented accommodation. The condition of public sector housing varies. Many of the Islington estates are currently being refurbished or replaced, through large-scale stock transfers to Registered Social Landlords, such as the Guinness Trust (Naish Court), Peabody Trust (Ten Estates) and Newlon (Barnsbury). Few transfers have occurred in Camden, but the Council has invested large sums in refurbishment of many blocks in the area.

Table 12.4 Dwelling Tenure in the London Boroughs of Camden and Islington

<table>
<thead>
<tr>
<th>Borough</th>
<th>Total dwellings</th>
<th>Local authority dwellings</th>
<th>RSL dwellings</th>
<th>Total public sector dwellings</th>
<th>Households on housing register, 1st April 2002</th>
<th>LA lettings and recommendations to RSLs (2001-02)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camden</td>
<td>92,379</td>
<td>26,007 (28%)</td>
<td>8,995 (9.7%)</td>
<td>35,808 (38.8%)</td>
<td>8,147</td>
<td>1783</td>
</tr>
<tr>
<td>Islington</td>
<td>85,626</td>
<td>30,585 (36%)</td>
<td>10,982 (12.8%)</td>
<td>42,065 (49.1%)</td>
<td>8,161</td>
<td>1861</td>
</tr>
</tbody>
</table>

Source: HIP-HSSA 2002, ODPM housing website

12.4.27 Table 12.4 demonstrates a significant demand for affordable housing in Camden and Islington, common to all Inner London authorities. Since 1998-99, the rate of new local authority lettings in Camden and Islington has fallen, both in actual numbers of properties let, and as a proportion of the total authority housing stock. The current rate of local authority lettings in both Boroughs is 5-6% of total authority housing stock per annum, down from around 7.5% p.a. in the late 1990s (ODPM, 2002). Vacancy rates have also been falling across London since the late 1990s (GLA, 2003a).

12.4.28 GLA Economics (GLA, 2003b) estimates that the shortage of available affordable housing has probably worsened since 2000. The minimum private sector weekly rent for a one-bedroom property in Camden during winter 2002-03 was £170; for Islington the figure was £115 (GLA, 2003d).

12.4.29 In April 2001, 1,165 households were in temporary accommodation in Islington, including 71 in bed and breakfasts. The total number of homeless households in temporary accommodation rose during the year to 1,422 in March 2002. This trend is expected to continue in the coming years because of the estimated reduction in available council and RSL property. Islington currently allocates 30 1-bedroom units per year to health and education workers. In all, there are nine developments currently in the ‘pipeline’ which will yield a supply of affordable housing for key workers in the coming years, producing some 260 units either for rent, market rent or shared ownership.
Demand for market housing in the Central and Wider Impact Zones outstrips supply and as a result, the value of this housing is high. Camden estimates that 97.2% of newly forming households, and 84.5% of existing households in unsuitable accommodation who need to move within the borough, are currently unable to afford market housing (LBC, 2003a).

Household projections and trends in conversion rates in the wider Kings Cross area suggest that a significant proportion of new housing in the area will need to cater for a growing number of smaller households. Camden’s Housing Conversion Rate Analysis (1996-2001) indicates that the combined Central and Wider Impact Zones have seen an additional 1,183 new housing units created through conversions of existing housing and offices since 1996. However, the majority of these units were created in the Wider Impact Zone through conversion of offices. There have only been 14 house conversions over the same period of which only 1 was recorded in the Central Impact Zone (St Pancras ward). This is largely a reflection of the poor suitability of the existing housing stock for conversion (predominantly social rented purpose built flats) rather than a lack of demand.

School Provision

Due to the small catchment areas of primary schools only those located in the Central Impact Area have been identified for this assessment. Conversely, secondary schools have a much greater catchment area and all that lie in the Wider and Central Impact areas have been identified without geographic distinction. Fourteen infant and primary schools are located within the Central Impact Zone and four secondary schools are located within the Central and Wider Impact Zones.

Capacity

There is currently a surplus of 427 places in infant and primary schools and 112 places in secondary schools within the combined Central and Wider Impact Zone. A tentative comparison between 2001 and 2003 indicates that surpluses have reduced during this period, although it should be noted that the figures are not directly comparable due to recent changes in the method of determining school capacity. The measured reduction may be influenced by the closure of Angel Primary School in 2002, which was located in the Wider Impact Zone. This closure forms part of Islington’s programme to reduce high levels of surplus places in their primary provision (LBI, 2003).

School capacities are not only influenced by activities within the borough but also by those of neighbouring boroughs. Secondary schools within Camden and Islington take a high proportion of students from other boroughs. In 2003, 46% of Camden’s secondary school places were occupied by students from outside the borough, with those from Islington accounting for 20%. Similarly, in the same year students from outside the borough occupied 52% of Islington’s secondary school places, with 26% being Camden residents. To a lesser extent, children from other boroughs fill primary school places. In Camden schools (Planning Areas 4 and 5), 5% to 10% of pupils come from a number of other boroughs, including Islington, Westminster, Haringey and Hackney. No comparable figures are available for Islington primary schools. This suggests that an increase in population locally would not necessarily directly correlate with demand for local school places.
**School Performance**

12.4.35 Primary school performance (Key Stage 2) in the Central Impact Zone was variable in 2002. Six primary schools achieved higher results than their respective borough averages and the London average, but five achieved lower results against those benchmarks (DfES, 2003). The GLA School Organisation Plan (2001) predicts that overall school performance in London will rise between 2001 and 2006. However, between 1999 and 2002 six of the eleven schools in the Central Impact Zone experienced a deterioration in performance. Notably, four of these schools were religious based schools which had previously scored higher than the non-denominational schools.

12.4.36 Secondary school performances in the Central and Wider Impact Zones are also variable, with two performing better than their borough averages and two falling short. However, secondary school performances have improved in the area over the past four years, both in terms of the percentage of pupils attaining five or more GCSE grades A* - C, and the number of students not passing any subjects (DfES, 2003).

12.4.37 Camden and Islington Councils have addressed school performance over recent years, through initiatives such as Excellence in Cities, the Camden Small Education Action Zone (EAZ), Islington Small EAZ, New Deal for Communities, and the King’s Cross Single Regeneration Budget (SRB). Some SRB activities have been continued using the Neighbourhood Renewal Fund programme (in which King’s Cross is a priority area). These programmes have had positive results, particularly for schools benefiting from the Camden Small EAZ and King’s Cross SRB programmes. For example, between 1999 and 2002 some primary schools in the Central Impact Zone, such as Richard Cobden, Edith Neville and Argyle schools, have significantly improved their Key Stage 2 results, with Richard Cobden raising its performance by 74% (LBC, 2003b; LBI, 2003).

**Religious Based Schools**

12.4.38 Six infant and primary schools and one secondary school within the study area are Christian, providing 836 places in Roman Catholic schools and 417 places in Church of England schools. There are no schools of non-Christian faith, which is not uncommon. However, given that 19% of the population in the Central and Wider Impact Zones are non-Christian, there appears to be an existing under provision of non-denominational (non-Christian) schooling (ONS, 2001).

**Skills and Adult Education**

12.4.39 Poor skills and related adult education is a major issue in the Kings Cross area and has been a focus for the King’s Cross Partnership¹ and Camden Central Partnership². The 1999 Skills Survey of King’s Cross residents identified that:

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¹ King’s Cross Partnership was awarded £37.5 million in 1996 from the Central Government Single Regeneration Budget (SRB) funds and directed these funds, over the 7 years between 1996 and 2003, in pursuit of Partnership goals: A Better Place to Live; A Sense of Place; No Place for Crime; A Place for Work; A Place for Business; A Place for Local People. The Partnership finished in 2003 but many of its employment and training programmes have continued with alternative funding.

² The Camden Central Partnership was awarded £7 million Single Regeneration Budget (SRB) funding from the London Development Agency (LDA) in 2000. The Partnership area includes most of St Pancras and Somers Town ward and parts of Camden with Primrose Hill, Regents Park and Cantelowes wards. The SRB funding is committed until 2006 and targeted on social or people-based projects and initiatives in the area.
47% of the economically active population had a post 16 qualification;
19% had a degree/diploma &/or teaching qualification;
10% had either NVQ or City & Guilds;
Nearly 1 in 10 had achieved ‘A’ Levels or their equivalent;
5% had a secretarial qualification, 2% an overseas qualification, 1% nursing.

As indicated in Table 12.5, the more recent Census 2001 statistics indicate that the Central Impact Zone has a greater number of people with no qualifications than London as a whole. This is particularly noticeable in the St Pancras and Somers Town ward and Caledonian ward, which have 32-33% of residents with no qualifications, in comparison to a London average of 24%. Residents in the Wider Impact Zone have a higher skill level than the Central Impact Zone. With the exception of the Holloway ward, residents in the Wider Impact Zone have a similar level of qualifications to London, which suggests that there are other reasons for the low levels of employment within the Wider Impact Zone identified previously in this report.

Table 12.5 Qualifications of Working Age Residents in the Central and Wider Impact Zones

<table>
<thead>
<tr>
<th>Area</th>
<th>All people aged 16-74</th>
<th>Percentage of people aged 16-74 with no qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central Impact Zone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St Pancras and Somers Town</td>
<td>8,805</td>
<td>33 %</td>
</tr>
<tr>
<td>Caledonian</td>
<td>8,993</td>
<td>32 %</td>
</tr>
<tr>
<td>King's Cross</td>
<td>9,248</td>
<td>18 %</td>
</tr>
<tr>
<td><strong>Central Impact Zone average</strong></td>
<td></td>
<td>27 %</td>
</tr>
<tr>
<td><strong>Wider Impact Zone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bloomsbury</td>
<td>8,103</td>
<td>12 %</td>
</tr>
<tr>
<td>Barnsbury</td>
<td>7,975</td>
<td>24 %</td>
</tr>
<tr>
<td>Cantelowes</td>
<td>8,243</td>
<td>20 %</td>
</tr>
<tr>
<td>Clerkenwell</td>
<td>7,821</td>
<td>23 %</td>
</tr>
<tr>
<td>Holloway</td>
<td>8,764</td>
<td>29 %</td>
</tr>
<tr>
<td>Holborn and Covent Garden</td>
<td>8,452</td>
<td>20 %</td>
</tr>
<tr>
<td>Regent's Park</td>
<td>8,965</td>
<td>25 %</td>
</tr>
<tr>
<td><strong>Wider Impact Zone average</strong></td>
<td></td>
<td>22 %</td>
</tr>
<tr>
<td><strong>London</strong></td>
<td>5,300,332</td>
<td>24 %</td>
</tr>
</tbody>
</table>

Source: Census 2001
A training audit undertaken for Camden Central Partnership (CAG, 2001) and an employment study on the construction industry (DTZ Pieda Consulting, 2003) found:

- no big gaps in training provision but a high demand for English as a Second or Other Language (ESOL) training and childcare training, which often leave classes oversubscribed;
- the main barriers to training are a lack of basic skills (literacy, numeracy, language, IT), lack of childcare facilities and multiple ‘well-being’ problems (such as homeless and mental and physical health);
- the existence of barriers to construction training. These barriers include a lack of appropriate training facilities, poor quality of some existing training providers, poor school-industry liaison, poor perception of construction as a career, a shortage of construction trainers, and a lack of links and co-ordination amongst providers in the area.

Community Facilities

A ‘community facility’ can be defined as a building or physical space that supports community services and activities. Community facilities include:

- Community centres;
- Cultural and leisure facilities;
- Crèche / nursery provision;
- Religious facilities;
- Open space.

Community Centres

A preliminary audit of community centres in the Central and Wider Impact Zones identified approximately 30 buildings available for community use. A more detailed audit was undertaken for the Camden Central SRB programme, which covers much of the Central Impact Zone. The audit found that the area was well served in terms of the number and type of buildings available for community use (ONS, 2001). The buildings range from small centres, run by local people providing beneficial advice and welfare rights sessions to the community, to large community centres for social and recreational use.

The report concluded that not all groups have ready access to these buildings, especially young people and those with disabilities. In addition, there is limited outreach or publicity on the activities offered, and many buildings are under resourced and under-utilised. In particular:

- tenant’s halls are only used for an average of five hours per week and community halls for 53 hours a week;
- tenant’s Halls form an important local resource with 90% of tenant hall users living locally and 79% of community hall users living locally;
- every hall and community building in the area requires some capital works including both internal and external decoration;
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- most halls have poor disability access and none have facilities for people with hearing or sight problems;
- most halls have visibility problems, e.g. poor signage, awkward access, obscured or unidentifiable entrances.

12.4.45 Recommendations from this audit are currently being implemented with the aim of improving the use of these buildings. Funding has been provided for free ESOL teaching, basic skills and job interview training in the community buildings.

Cultural and Leisure Facilities

12.4.46 A number of cultural and leisure facilities are located in the Central and Wider Impact Zones, including arts centres, galleries, cinemas, exhibition and conference centres, libraries and museums. The majority of these are private facilities. There are no audits available to determine the capacity and demand for these facilities, or the extent to which they are accessible to all residents in the area.

Crèche and Pre-School Provision

12.4.47 Approximately 43 childcare facilities are provided in the Central Impact Zone and another 54 in the Wider Impact Zone. These facilities vary in type (crèches, day nurseries, nursery schools and pre-school play groups), size, and the age groups that they provide for.

12.4.48 The area has been prioritised for the improvement of pre-school and parent support facilities through two Sure Start programmes (Sure Start Euston and Sure Start King’s Cross and Holborn). These aim to provide education facilities for services catering for children under four years old and their families. A new 26-place nursery has recently been opened in Somers Town as part of this programme, and another is planned over the next two years for Regents Park ward (26 places). Camden aims to provide funded nursery education places for up to 85% of its 3 year-olds by the summer term 2004. The Council also aims to provide 995 new out of school places (excluding childminders) by the end of 2004, with a focus on deprived wards such as St Pancras and Holborn (LBC, 2003b).

12.4.49 At the borough level, there appears to be an adequate quantity of nursery provision (3 and 4 year olds) (LBC, 2003b), but the affordability of these excludes those with parents on low incomes. For example, only 40% of three year olds in the borough could access funded nursery places (LBC, 2001a). The quantity of provision for under-threes is considered poor in the area. In particular the wards of St Pancras, Camden, Holborn and Regent’s Park have insufficient provision for under-threes for those parents wishing to go to work (LBC, 2003b). The Central Impact Zone only has nine facilities that cater for children under two years of age and two facilities for children under six months. This is considered to be a strong factor in the low proportion of lone parents in full or part time employment as described earlier.

Religious Facilities

12.4.50 The study area contains a mix of religions, with approximately 78% of people belonging to a religion as indicated in Table 12.6. The study area is primarily Christian (50%). The most common non-Christian faith is Muslim (14%), with a small proportion of people (less than 1.5%) belonging to the Buddhist, Jewish, Hindu, Sikh and ‘other’ faiths. In comparison to London, the most significant differences in the Central and Wider Impact Zones are the fewer Christians and almost twice the number of Muslims. The Central and Wider Impact Zones also have a greater number of people of no religion.
There are 134 religious meeting places within two miles of the site of which:

- 78% are Christian (Church of England, Methodist, Orthodox, Roman Catholic, Baptist, Reformed, Protestant);
- 3% are Jewish;
- 2% are Muslim;
- 2% are Buddhist;
- 2% are Hindu; and
- 13% are for other religions.

When compared to the proportion of religions in the area there is an over dominance of Christian meeting places and an under supply of Muslim meeting places.

No information is available on the size of congregations, the ability of the premises to cater for these sizes, or the quality of the facilities. However, Camden Council indicates the newer religions to the area resulting from migration are at an early stage in development in terms of finding suitable premises. For example, the Muslim religion is growing in Camden as a result of the arrival of the Bangladeshi community. In the absence of purpose built mosques, meeting places for this community in Camden comprise of shops, converted houses and basements (LBC, 2003e).

**Table 12.6 Religion in the Central and Wider Impact Zones**

<table>
<thead>
<tr>
<th>Ward</th>
<th>Christian %</th>
<th>Buddhist %</th>
<th>Hindu %</th>
<th>Jewish %</th>
<th>Muslim %</th>
<th>Sikh %</th>
<th>Other %</th>
<th>No religion %</th>
<th>Not stated %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kings Cross</td>
<td>40.9</td>
<td>2.1</td>
<td>2.4</td>
<td>1.2</td>
<td>22.5</td>
<td>0.3</td>
<td>0.8</td>
<td>21.4</td>
<td>8.4</td>
</tr>
<tr>
<td>St Pancras and Somers Town</td>
<td>49.9</td>
<td>0.9</td>
<td>1.1</td>
<td>0.8</td>
<td>22.9</td>
<td>0.2</td>
<td>0.4</td>
<td>14.6</td>
<td>9.1</td>
</tr>
<tr>
<td>Caledonian</td>
<td>53.4</td>
<td>1.5</td>
<td>0.9</td>
<td>0.7</td>
<td>10.1</td>
<td>0.2</td>
<td>0.4</td>
<td>23</td>
<td>9.8</td>
</tr>
<tr>
<td>Bloomsbury</td>
<td>47.6</td>
<td>2</td>
<td>3.2</td>
<td>2.3</td>
<td>11.4</td>
<td>0.6</td>
<td>0.7</td>
<td>23.5</td>
<td>8.7</td>
</tr>
<tr>
<td>Regents Park</td>
<td>47.1</td>
<td>0.9</td>
<td>1.4</td>
<td>2.6</td>
<td>21.2</td>
<td>0.2</td>
<td>0.4</td>
<td>16.5</td>
<td>9.8</td>
</tr>
<tr>
<td>Holburn and Covent</td>
<td>47.5</td>
<td>1.5</td>
<td>1.6</td>
<td>1.7</td>
<td>16.5</td>
<td>0.2</td>
<td>0.4</td>
<td>19.2</td>
<td>11.4</td>
</tr>
<tr>
<td>Cantelowes</td>
<td>45.8</td>
<td>1.6</td>
<td>0.9</td>
<td>2.2</td>
<td>10.6</td>
<td>0.1</td>
<td>0.5</td>
<td>27.2</td>
<td>11</td>
</tr>
<tr>
<td>Barnsbury</td>
<td>54.2</td>
<td>1.2</td>
<td>0.6</td>
<td>1</td>
<td>8.4</td>
<td>0.3</td>
<td>0.4</td>
<td>23.7</td>
<td>10</td>
</tr>
<tr>
<td>Holloway</td>
<td>56</td>
<td>1.2</td>
<td>1.6</td>
<td>0.8</td>
<td>7.6</td>
<td>0.3</td>
<td>0.3</td>
<td>22.2</td>
<td>10.1</td>
</tr>
<tr>
<td>Clerkenwell</td>
<td>55.9</td>
<td>1.2</td>
<td>0.9</td>
<td>0.9</td>
<td>6</td>
<td>0.6</td>
<td>0.4</td>
<td>24.6</td>
<td>9.4</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>49.83</strong></td>
<td><strong>1.41</strong></td>
<td><strong>1.46</strong></td>
<td><strong>1.42</strong></td>
<td><strong>13.72</strong></td>
<td>0.3</td>
<td>0.47</td>
<td><strong>21.59</strong></td>
<td><strong>9.77</strong></td>
</tr>
</tbody>
</table>

**Proportion Religious**

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Religious</td>
<td>63.6</td>
<td>1.8</td>
<td>1.9</td>
<td>1.8</td>
<td>17.5</td>
<td>0.2</td>
<td>0.4</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>12.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Source: Census 2001 Neighbourhood Statistics

**Open Space**
12.4.54 The area contains a range of open space in terms of use, size, and classification. The Central Impact Zone contains approximately 35 open spaces (23 public) and the Wider Impact Zone another 67 (34 public), with the Regent’s Canal running through both areas and the site. The west of the King’s Cross Central site borders Camley Street Natural Park, a small part of which is included in the application area.

12.4.55 The characteristics of the open space in each area are as follows:

**Central Impact Zone**

- There is a predominance of public open space that falls within the ‘local park’ and ‘small open space’ classifications of open space hierarchy (LPAC, 1994 and GLA, 2002c, London Borough of Camden, Unitary Development Plan 2000).
- Two local private open spaces have public access.
- There is a predominance of public open space for informal / passive uses, with few play areas or sports areas.
- Six open spaces (public and private) are classified as London Squares, four as Parks and Gardens of Special Historic Interest, and four with various nature conservation designations.
- The majority of open space has controlled access.
- There are two areas of public open space deficiency identified in Camden’s Unitary Development Plan of 2000: on the proposal site itself and in the south-east of the Central Impact Zone.

**Wider Impact Zone**

- There is a predominance of public open space that falls within the ‘small open space’ classification of the open space hierarchy (LPAC, 1994 and GLA, 2002c).
- There are three public open spaces that fall within the ‘local park’ classification and one within the ‘district park’ classification of the open space hierarchy.
- There is one open space classified as ‘metropolitan open land’ (Regents Park).
- 21 open spaces (public and private) are classified as London Squares, seven as Parks and Gardens of Special Historic Interest, and seven with various nature conservation designations.
- There is a predominance of public open space for informal / passive uses, with very few play areas and no open spaces solely for sport within the area.
- Regents Park and open space in the south of the area have controlled access. The Regent’s Canal and open space in the remainder of the area have 24-hour access.
- There is a large area of public open space deficiency at the south-eastern corner of the area and smaller areas of deficiency to the west.
12.4.56 The inner London character of Camden and Islington mean that in parts they include large areas of ‘open space’ deficiency, where access to a range of open spaces is considered below an average applied across London as a whole. However, Camden and Islington are no different to other inner London Boroughs where the value of land, density of development and pressure for new development means areas of deficiency can rarely be completely addressed by development projects without compromising other important objectives. This makes measures of open space deficiency based on numbers of spaces, acreage and location poor indicators of the adequacy of provision or their appropriateness for use by local residents.

12.4.57 In King’s Cross, the proximity of Regents Park, Caledonian Park and Bingfield Park means that the deficiency is in small local spaces rather than larger parks. Where larger areas accommodate a number of different activities these deficiencies are not necessarily recognised by residents. For example Regents Park offers sports facilities, quiet gardens, large ball-playing areas and outdoor performance space. This range of activities is far greater than most communities in inner London could hope for and would be difficult to achieve in a series of small spaces spread across a large geographic area. Often it is their concentration in one location that gives them vibrancy and a sense of safety that attracts users.

12.4.58 The quality of management of open spaces is often a better indicator of their levels of use and it is also a key determining factor. Spaces which are poorly managed and have a run down or unsafe feel are usually underused despite their proximity to residential areas. There are examples in the King’s Cross area where spaces within housing estates are managed differently than those belonging to the Parks departments. The different management regimes can mean different levels of access, quality and use. The same is true between spaces in Camden and Islington. This has made it very difficult to measure deficiency using any other basis than numbers and location. Yet it is clear from current priorities (e.g. plans to improve Bingfield Park and Crumbles Castle) that improvements to some spaces (in Bingfield Park’s case, a larger space) are being undertaken to meet local needs and may well overcome the ‘need’ for enhanced provision dictated by ‘deficiency’ measures alone.

12.4.59 In considering the contribution that King’s Cross Central makes to meeting local open space needs the assessment should consider the proposals for open space and new public realm within the wider context of the range of spaces already available to residents and the difficulties Local Authorities face in managing multiple sites to sufficient standards. New proposals could readily provide alternative provision to address existing deficiency without providing the quantity or form implied by deficiency standards.

Crime

12.4.60 The Camden and Islington boroughs have higher levels of recorded violence across all types of offences in comparison to the London average. This is illustrated in Figure 12.6.

12.4.61 Kings Cross has a particular reputation for drug offences, street prostitution, robbery and violence. These remain the principal recorded crimes in the Kings Cross area, although their incidence has fallen in recent years, as a result of concentrated and targeted operations by the police, particularly against drug dealing and prostitution (‘Operation Welwyn’). Operation Welwyn recorded a decrease in total drugs crime (trafficking and possession) in all four wards covered by the scheme. The St Pancras and Somers Town ward has experienced the most dramatic decrease from 416 offences in 1999 to 149 in 2002, although this figure does not convey the increase in drugs trafficking that occurred
during the period (Kong, 2003). Crime trends in the Central and Wider Impact Zones identified from recent Crime Audits (LBC; 2003d; LBI, 1998) are as follows:

- King’s Cross has a predominance of hate crimes and drugs crime;
- St Pancras has a high number of incidences of violence against the person;
- Somers Town has a high number of incidences of violence against the person, disorder and anti-social behaviour;
- Bloomsbury has the highest crime rate in Camden, and is particularly high in drugs, hate and car crime, disorder and anti-social behaviour, and violence against the person;
- Clerkenwell is one of Islington’s worst wards in terms of overall offences.

12.4.62 The 2001 Crime Audits for Camden and Islington (LBC 2001 and LBI 2001) also revealed that the Central and Wider Impact Zones contain a significant number of offenders. In particular, the wards of Kings Cross, St Pancras, Somers Town, Bloomsbury, Holloway and Clerkenwell had the highest number of offenders resident in the two boroughs.

12.4.63 ‘Operation Welwyn’ continues to target crime in Kings Cross. However, drug use within society generally has continued to rise and the ‘local’ drugs market has become part of a larger and more mobile market, stretching west to Euston Station and south to Bloomsbury and Soho.

12.5 Baseline 2006/7

12.5.1 In addition to projections based on the existing situation described above, information has been gathered from the impact assessments undertaken for the CTRL project, the Regent Quarter development, Arsenal and the King’s Place development proposals for Battlebridge Basin. This research provides important contextual information including expected employment levels in 2006/2007.

Multiple Deprivation

12.5.2 Continuing regeneration activity within the Camden Central Single Regeneration Budget area (defined by boundaries within Camden, Somers Town and St Pancras wards) is specifically aimed at addressing social and economic deprivation in the Central Impact Zone area, but the outcome of this activity is unlikely to significantly affect deprivation indicators until after the programme has been completed in 2007. The success of the programme will also be largely dependent on the extent of population turnover during this period. The programme is aimed primarily at supporting community capacity building work, social development and local enterprise. Therefore it is unlikely to significantly change employment levels, local incomes or housing conditions. The programme does include local environmental improvements. The Kings Cross Partnership Single Regeneration Budget ceased in April 2002 and Camden and Islington Council’s have been working with the London Development Agency to ensure many of the programmes begun by the Partnership are continued.
12.5.3 The London Development Agency has identified the area from King's Cross to Finsbury Park as one of the priority areas for “Single Programme” funding, making £13.8m available for special initiatives from April 2003 to March 2007. The funding is intended to “influence the development of the three key hubs in the area - King's Cross, Arsenal, and Finsbury Park – so that they can play a key role as a driver for the central London economy, and to ensure that they provide real benefits to local people and local businesses” (LDA, 2003). In the King's Cross hub the LDA aims to:

- create pathways into employment through continued support for the Tracks Towards Employment job brokerage ('Tracks') model, local labour interventions, customised employment and training packages linked to main employment sectors;
- support the growth of key business and clusters in the area-including advice, support and access to premises, capacity building through networking and inward investment activities;
- influence the physical environment-property/infrastructure investment, testing out new management mechanisms to improve the public realm and tackle crime.

12.5.4 Camden, Islington and the London Development Agency are jointly setting up a Construction Training Centre at King's Cross (initially located on land controlled by London and Continental Railways) aimed at helping local people gain the skills needed to take advantage of job opportunities that arise from major developments in the area (including CTRL, Regents Quarter, Arsenal and potentially King's Cross Central).

12.5.5 Whilst it is assumed that a number of training and employment initiatives will continue beyond 2007 it is difficult to estimate their effect on local employment rates or unemployment. Historic trends suggest that limited changes in local demographic and tenure structure have taken place in King’s Cross over the last 15 years despite the efforts of targeted regeneration programmes. This may be due to high transience rates amongst parts of the population (e.g. new immigrants – see 12.5.10), and the dominance of Social Housing in the area retaining large numbers of low income households locally. There are no proposals that introduce large amounts of new affordable or mixed tenure housing into the area before 2007.

12.5.6 Therefore it is assumed that the Central and Wider Impact Zone wards will display similar deprivation characteristics in 2007 as the 2000 Index, perhaps with some improvements to the quality of the local housing stock and education performance which has improved since the 2000 Index of Multiple Deprivation was published.

**Demographics**

12.5.7 The Office of National Statistics ‘Focus on London’ (2003) estimates that the population of the Inner London boroughs will rise by approximately 6.89% between 2001 and 2021. Applied to the Central Impact Zone and the Wider Impact Zone, this would suggest populations of 37,913 and 78,654 respectively, by 2021.

12.5.8 GLA population growth projections for Central London provide estimates for 2006 at ward level. The 1999 ward-based projection forecasts a 3.4% increase in the population of the combined Central and Wider Impact Zones by 2006 (3,222 people). This results in a net population growth in the Central Impact Zone of 822 people (2,400 in the Wider Impact Zone) but includes a population decline in Brunswick (-169), Camden (-124) and Holloway (-11) wards. The projections do not take account of the Kings Cross Central
proposals implying that the new projected population would need to be accommodated in existing housing stock, conversions and other new developments.

12.5.9 The GLA forecast (2002d) anticipates a steady growth rate throughout the forecast period. However, this is not likely to be reflected at the local scale as the completion of major residential developments is likely to result in a more staggered pattern of population growth within the Central Impact Zone and the Wider Impact Zone.

12.5.10 Table 12.7 indicates the projected change in population between 2001 and 2006 for the Central and Wider Impact Zones based on GLA data.

Table 12.7 2001-2006 Projected Population Change

<table>
<thead>
<tr>
<th>Borough/ward</th>
<th>Total Change</th>
<th>0-4 yrs</th>
<th>5-14 yrs</th>
<th>15-24 yrs</th>
<th>25-39 yrs</th>
<th>40-59 yrs</th>
<th>60+ yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central Impact Zone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brunswick</td>
<td>-169</td>
<td>-12</td>
<td>-18</td>
<td>-79</td>
<td>-100</td>
<td>62</td>
<td>-131</td>
</tr>
<tr>
<td>Camden</td>
<td>-124</td>
<td>-44</td>
<td>-107</td>
<td>89</td>
<td>-267</td>
<td>230</td>
<td>-27</td>
</tr>
<tr>
<td>King’s Cross</td>
<td>188</td>
<td>-4</td>
<td>-26</td>
<td>122</td>
<td>-74</td>
<td>210</td>
<td>58</td>
</tr>
<tr>
<td>Somers Town</td>
<td>609</td>
<td>96</td>
<td>-7</td>
<td>128</td>
<td>255</td>
<td>157</td>
<td>296</td>
</tr>
<tr>
<td>Holloway</td>
<td>-11</td>
<td>0</td>
<td>61</td>
<td>43</td>
<td>-180</td>
<td>184</td>
<td>-93</td>
</tr>
<tr>
<td>Thornhill</td>
<td>329</td>
<td>41</td>
<td>-9</td>
<td>82</td>
<td>52</td>
<td>176</td>
<td>15</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>822</td>
<td>77</td>
<td>-106</td>
<td>385</td>
<td>-314</td>
<td>1,019</td>
<td>118</td>
</tr>
<tr>
<td><strong>Wider Impact Zone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bloomsbury</td>
<td>789</td>
<td>21</td>
<td>125</td>
<td>-203</td>
<td>473</td>
<td>308</td>
<td>475</td>
</tr>
<tr>
<td>Regents Park</td>
<td>186</td>
<td>16</td>
<td>-43</td>
<td>158</td>
<td>-6</td>
<td>204</td>
<td>-142</td>
</tr>
<tr>
<td>St Pancras</td>
<td>19</td>
<td>-13</td>
<td>-31</td>
<td>150</td>
<td>-143</td>
<td>136</td>
<td>-67</td>
</tr>
<tr>
<td>Holborn</td>
<td>1,160</td>
<td>72</td>
<td>168</td>
<td>310</td>
<td>155</td>
<td>353</td>
<td>682</td>
</tr>
<tr>
<td>Barnsbury</td>
<td>18</td>
<td>26</td>
<td>-119</td>
<td>42</td>
<td>-42</td>
<td>117</td>
<td>21</td>
</tr>
<tr>
<td>Clerkenwell</td>
<td>229</td>
<td>42</td>
<td>-34</td>
<td>111</td>
<td>-70</td>
<td>268</td>
<td>-81</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>2,400</td>
<td>164</td>
<td>66</td>
<td>568</td>
<td>367</td>
<td>1,386</td>
<td>888</td>
</tr>
<tr>
<td><strong>Kings Cross Area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(combined CIZ &amp; WIZ)</em></td>
<td>3,222</td>
<td>241</td>
<td>-40</td>
<td>953</td>
<td>53</td>
<td>2,405</td>
<td>1,006</td>
</tr>
<tr>
<td>Camden</td>
<td>1,063</td>
<td>-118</td>
<td>-43</td>
<td>415</td>
<td>-2,628</td>
<td>3,879</td>
<td>360</td>
</tr>
<tr>
<td>Islington</td>
<td>920</td>
<td>-60</td>
<td>-233</td>
<td>1705</td>
<td>-4,257</td>
<td>4,613</td>
<td>-561</td>
</tr>
</tbody>
</table>

Source: GLA population growth estimates 2003

12.5.11 Transience is common among the population of Inner London, and Camden and Islington experience similar levels to the Inner London average. Census data (table KS24, ONS website) demonstrates that in 2000-2001, some 13% of Camden residents moved into the borough that year, compared with 11% in Islington (see Table 12.8 below). Including residents who had previously been homeless, and those who had relocated within each borough, transience increased to 21% and 17% respectively, compared with an Inner London average of 18%.
### Table 12.8 Movement in the London Boroughs of Camden and Islington 2000-2001

<table>
<thead>
<tr>
<th>Borough</th>
<th>In-migrants</th>
<th>Previously homeless</th>
<th>Moving within borough</th>
<th>Out-migrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camden</td>
<td>26,194 (includes 7,507 from outside UK: 28.6%)</td>
<td>3,711</td>
<td>10,964</td>
<td>20,769</td>
</tr>
<tr>
<td>Islington</td>
<td>19,319 (includes 3,699 from outside UK: 19.1%)</td>
<td>3,305</td>
<td>7,178</td>
<td>17,763</td>
</tr>
<tr>
<td>Inner London</td>
<td>291,031 (includes 68,116 from outside UK: 23.4%)</td>
<td>51,567</td>
<td>140,588</td>
<td>246,827</td>
</tr>
</tbody>
</table>

Source: Census 2001

12.5.12 Camden has a significantly greater proportion of migrants arriving from overseas than Islington, although it should be noted that these findings for both Boroughs are likely to underestimate the true figures. Islington has more arrivals from the rest of the UK than the Inner London average.

12.5.13 Excluding previously homeless people, Camden saw a net growth of 5,425 residents as a result of migration. In Islington this figure was 1,556. If this trend were to continue, migration activity would result in a net growth of 32,550 residents in Camden and 9,336 in Islington by the baseline year of 2007.

12.5.14 The age profiles of the population projections show a complex pattern of growth and decline between age groups in different parts of the Kings Cross area. The greatest growth is expected in the 40-59 years age group with around 2,400 new residents expected by 2006 in the combined Central and Wider Impact Zones. In the Wider Impact Zone the 60+ and 15-24 age groups also show significant growth (nearly 900 and 600 new residents respectively) in contrast to the smaller increases in the same groups in the Central Impact Zone (118 and 385 respectively). The 25-39 years and 5-14 years age groups show significant decline in the Central Impact Zone (reduction of 314 and 106 people respectively).

12.5.15 Between 2001 and 2006 growth can be expected in the 15-24 and 40+ age groups in the Central Impact Zone, in small household structures.

### Ethnicity

12.5.16 In line with London wide trends, continued increases in ethnic diversity may be expected, especially growth among the Bangladeshi, Chinese and black populations within the Central Impact Zone.

12.5.17 The Camden Draft Schools Organisation Plan (June 2003b: p12) estimates that in January 2003 some 19% of its primary and 12% of secondary pupils were refugees.
Employment

12.5.18 London wide trends suggest a current stagnation in employment growth in all existing local sectors, with only minor increases expected between 2002 and 2007. However, local employment growth can be expected between 2002 and 2007 from a combination of five developments: Lough Road, Regent Quarter, St Pancras Chambers and CTRL and King’s Place. These are likely to yield the following net growth in jobs:

Table 12.9 Estimated Employment Growth Between 2002 and 2007 (Permanent Jobs)

<table>
<thead>
<tr>
<th>Development</th>
<th>Gross Jobs</th>
<th>Jobs Displaced</th>
<th>Total Net Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lough Road</td>
<td>1,747*</td>
<td>70</td>
<td>1,677</td>
</tr>
<tr>
<td>Regent Quarter</td>
<td>2,600**</td>
<td>not known</td>
<td>2,600</td>
</tr>
<tr>
<td>CTRL at St Pancras (operational phase)</td>
<td>600</td>
<td>400</td>
<td>200</td>
</tr>
<tr>
<td>St Pancras Chambers</td>
<td>120</td>
<td>0</td>
<td>120</td>
</tr>
<tr>
<td>King’s Place</td>
<td>3,000****</td>
<td>not known</td>
<td>3,000***</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8,067</td>
<td>470</td>
<td>7,597</td>
</tr>
</tbody>
</table>

* including 1,004 relocated jobs and 65 full time equivalent temporary jobs
** 1,000 temporary construction jobs calculated as 100 full time equivalent jobs
***assuming no displacement of existing jobs
****figure estimated by Islington Council Planning team (January 2004)

12.5.19 Overall the combined new developments are expected to create around 7,600 new jobs in the wider King’s Cross Area before 2007 (see Table 12.9).

12.5.20 Given the small numbers of people living in the Central Impact Zone travelling to work in the area (around 3% of all jobs in the Central Impact Zone), with significant training and brokerage efforts, the new employment opportunities created are likely to generate up to a 10% local employment rate (760 jobs), with local socio-economic benefits. However, none of the proposals are of sufficiently large scale to have a significant sub-regional (North London) or pan-London employment impact. Therefore it is unlikely that these developments will significantly affect employment numbers or unemployment rates across the Central or Wider Impact Zones.
Table 12.10 Employment Change in the Kings Cross Area 1991-2006

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Central Impact Zone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brunswick</td>
<td>6.1</td>
<td>4.3</td>
<td>-29.3</td>
<td>8,263</td>
</tr>
<tr>
<td>Camden</td>
<td>10.3</td>
<td>10.6</td>
<td>2.9</td>
<td>2,381</td>
</tr>
<tr>
<td>King’s Cross</td>
<td>19.0</td>
<td>12.0</td>
<td>-36.9</td>
<td>6,529</td>
</tr>
<tr>
<td>Somers Town</td>
<td>14.1</td>
<td>12.4</td>
<td>-11.8</td>
<td>18,172</td>
</tr>
<tr>
<td>Holloway</td>
<td>12.2</td>
<td>12.2</td>
<td>-0.3</td>
<td>4,482</td>
</tr>
<tr>
<td>Thornhill</td>
<td>15.0</td>
<td>11.1</td>
<td>-26.0</td>
<td>3,622</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>43,449</td>
</tr>
<tr>
<td><strong>Wider Impact Zone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bloomsbury</td>
<td>6.4</td>
<td>9.0</td>
<td>40.5</td>
<td>60,531</td>
</tr>
<tr>
<td>Regents Park</td>
<td>10.6</td>
<td>6.6</td>
<td>-37.9</td>
<td>10,309</td>
</tr>
<tr>
<td>St. Pancras</td>
<td>15.8</td>
<td>8.9</td>
<td>-43.6</td>
<td>5,878</td>
</tr>
<tr>
<td>Holborn</td>
<td>9.9</td>
<td>9.8</td>
<td>-0.5</td>
<td>49,586</td>
</tr>
<tr>
<td>Barnsbury</td>
<td>17.8</td>
<td>12.3</td>
<td>-30.8</td>
<td>2,571</td>
</tr>
<tr>
<td>Clerkenwell</td>
<td>12.7</td>
<td>14.5</td>
<td>14.3</td>
<td>25,161</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>154,036</td>
</tr>
<tr>
<td><strong>King’s Cross Total</strong></td>
<td>197,485</td>
<td>248,710</td>
<td>254,360</td>
<td>25.9</td>
</tr>
<tr>
<td>Camden</td>
<td>8.5</td>
<td>9.0</td>
<td>5.3</td>
<td>202,331</td>
</tr>
<tr>
<td>Islington</td>
<td>12.5</td>
<td>11.0</td>
<td>-11.6</td>
<td>112,668</td>
</tr>
<tr>
<td><strong>Greater London</strong></td>
<td>7.1</td>
<td>6.0</td>
<td>-15.5</td>
<td>3,254,647</td>
</tr>
</tbody>
</table>

*2006 employment calculated by adding additional employment created by development in the area to the 2001 employment figure (rounded up to allow for minor growth in other sectors).

**Total of all Boroughs average
12.5.21 Work undertaken by the King’s Cross Partnership as part of its Training Strategy identified a number of local employment sectors expected to grow over the next decade. These included: business and finance services; hotel and catering; and creative cultural industries. Parallel studies have also identified local demand from a number of small business sectors including not-for-profit/ charitable/ voluntary sectors; professional services; communications and media; service retail; light industry and warehousing. It is predicted that these sectors will continue to grow, particularly influenced by the Regent Quarter development, which includes 28,000m² of office accommodation marketed at the communications and media sectors.

12.5.22 By 2007 it is assumed that all existing site tenants affected by CTRL construction work will have left the site. There are currently estimated to be around 200 jobs in some 40 small businesses on land owned by Exel. Whilst many of these businesses are likely to have left the site by 2007, for the purposes of the impact assessment it is assumed that 200 jobs would be the worst case scenario for jobs displaced by King’s Cross Central.

**Housing**

12.5.23 To date, none of the local housing renewal schemes have significantly increased the quantity of social housing available locally (most replace and enhance what is already there). Yet both Camden and Islington Councils predict Borough-wide housing increases of around 3,547 and 3,694 respectively by 2007 (excluding the Regent Quarter and Lough Road developments). These will help to relieve some of the pressure on each Borough’s housing waiting lists. Further transfers of Islington housing stock to Registered Social Landlords may occur and new build Registered Social Landlord housing is planned in both Camden and Islington, to let and for shared ownership.

12.5.24 At the local level, the Regent Quarter and Lough Road schemes both include significant housing elements resulting in the provision of 138 and 819 new units respectively. Around 205 of these units (all in Lough Road) will be affordable (social rented and shared equity). 45 new affordable units are also being built by Circle 33 Housing Association at the former Playground Site, Junction of Gifford Street and Rufford Street.

**Table 12.11 A breakdown of housing unit type in the Lough Road and Regents Quarter developments**

<table>
<thead>
<tr>
<th>Housing Type</th>
<th>Regent Quarter Scheme</th>
<th>Lough Road Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 bed unit</td>
<td>74</td>
<td>195</td>
</tr>
<tr>
<td>2 bed unit</td>
<td>47</td>
<td>388</td>
</tr>
<tr>
<td>3 bed unit</td>
<td>16</td>
<td>78</td>
</tr>
<tr>
<td>4 bed unit</td>
<td>0</td>
<td>54</td>
</tr>
<tr>
<td>Studio</td>
<td>1</td>
<td>104</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>138</strong></td>
<td><strong>819</strong></td>
</tr>
</tbody>
</table>
Education

12.5.25 Camden and Islington Councils’ projections of school capacity indicate continued surpluses in Camden and Islington primary schools, in the region of 7-9% of total capacity. The number of surplus places is likely to increase slightly in Camden but decrease in Islington (Planning Areas 5 and 6) by 2006/7. There are no known plans for further closures of schools in the Central or Wider Impact Zones. Therefore, it is assumed that in 2007 there will be between 235 and 302 surplus places in infant and primary schools in the combined Central and Wider Impact Zone.

12.5.26 Borough-wide projections for secondary schools indicate an increase in surplus places at Islington schools but a deficit (and an increase in deficit) at Camden schools. As described above, Camden secondary schools within the Central and Wider Impact Zones currently have surplus places but this is contrary to the borough situation. Camden secondary schools within the Central and Wider Impact Zones are however estimated to have a potential deficit of 8.5% by 2007 – approximately 213 places (assuming no additional capacity at the three schools and applying the borough school roll increase of 5.7%). The Islington secondary schools within the Central and Wider Impact Zones are expected to have a surplus of 7.3% (102 places) by 2007, with more spare capacity than at present. In the combined Central and Wider Impact Zone secondary schools, there is therefore expected to be a deficit of 111 places by 2007.

12.5.27 The quality of school provision is unlikely to continue to improve at the rate that many of the schools have over the past few years. Performances have generally improved over the past few years due to specific programmes targeting schools. While these programmes have either ceased or are nearing completion, the principles established during them have been adopted by the local education authorities (LBC, 2003b) and should therefore help to maintain current levels of performance. However, further dramatic leaps in performance are unlikely without major changes to the local education system. Therefore school performance has been projected to remain in 2007 at equivalent levels to current indicators.

12.5.28 Therefore for the purposes of this Environmental Statement, the assumed baseline situation for schools at 2006/7 is:

- 7-9% surplus of primary school places in the Central Impact Zone amounting to between 235 and 302 surplus places;
- up to 8.5% deficit in secondary school places in the Camden part of the Central and Wider Impact Zone but up to 7.3% surplus in the Islington part; in total, a deficit of approximately 111 places;
- similar school performances to the current levels.

Skills and Adult Education

12.5.29 The skill level of residents in the economically active age population is likely to improve between now and 2006/7 with the implementation of training projects through the Camden Central Partnership and joint initiatives with the London Development Agency. This will have a direct impact on the potential for local residents to take jobs in new developments by 2006/7. The assumed 2007 baseline estimates an increase in the number of workers in the Central and wider Impact Zones living locally from 3% to 5%.
Income

12.5.30 With growth in local employment opportunities income levels could also be expected to rise. However, the number of new jobs taken by local people (maximum of 800) and the dominance of social housing and high transience rates in the area mean that unemployment rates are unlikely to fall significantly and income levels unlikely to rise noticeably by 2006/7. Current income patterns are therefore assumed for the 2007 baseline.

Community Facilities

Community Centres

12.5.31 The main changes to community facilities that are likely to occur by 2006/7 will arise from the programme of works implemented by Camden Central Partnership. The projects focus on improving services within the buildings and small-scale physical improvements to the buildings. In addition to the Partnership’s work, a replacement community hall is to be established at Naish Court as part of the Guinness Trust’s redevelopment, and money has been committed to community projects from the Regent’s Quarter development. No other new community centres are anticipated by 2006/7.

12.5.32 Therefore, in 2006/7 there will be the same overall quantity of community centre provision as currently exists, but there may be an increase in the quality and use of these facilities and less available capacity.

Cultural and Leisure Facilities

12.5.33 There will be an increase in the provision of cultural and leisure facilities by 2006/7 following the completion of:

- a gymnasium and gallery at Regent Quarter;
- a replacement library at Naish Court;
- a concert hall and associated facilities at King’s Place.

12.5.34 There are no plans for new religious facilities in the area indicating that by 2006/7 there is unlikely be sufficient non-Christian meeting places for the existing population.

Child Care

12.5.35 Projections are only available for nursery age children (3-4) at the borough level. These projections indicate that by 2006/7 there will be 4,284 children of this age and 4,945 places, indicating a surplus in provision. There is no information available regarding care for children under this age. It is assumed that the current quality and quantity of facilities will not substantially alter by 2006/7.
Open Space

12.5.36 Planning Permission was granted by Islington Council for improvements to Bingfield Park and Crumbles Castle on 11 March 2004. It is not clear when these improvements will be made but it is assumed they will be completed by 2007. Other improvements to small Green Spaces (local parks and spaces within Housing Estates) are also expected before 2007 although it is not clear which spaces will be prioritised by Camden and Islington Councils.

Crime

12.5.37 Of the five major developments that will occur before 2007, the Regent Quarter scheme and the completion of the Channel Tunnel Rail Link (and International Station) are likely to have the greatest impact on the image and perception of King’s Cross. The changing character of the area and the removal of many of the focal points for criminal activity brought about by these and other developments is likely to help reduce the attractiveness of the area for certain types of criminal activity (drug dealing and prostitution in particular). It is difficult to quantify the extent of this effect but a reduction in criminal activity is expected.

12.5.38 However, crime rates in housing areas in the Central Impact Zone (particularly antisocial behaviour) that do not necessarily relate to the drugs and prostitution activity of the wider area are unlikely to fall dramatically without significant improvements in local social, economic and physical conditions. For these areas the current situation can therefore be assumed to remain in 2006/7.

12.6 Proposals

12.6.1 As explained in Part 3.2 of this Environmental Statement, the proposed development is defined by Development Specifications for the Main Site and the Triangle Site, incorporating a number of Parameter Plans. The Development Specifications define and fix the parameters of the development, and form the basis for this assessment of socio-economic effects.

Assumptions and the ‘Worst Case’

12.6.2 The assessment considers two scenarios that give rise to the greatest (largest) impacts from new jobs and population created by development. Both potentially generate different effects on socio-economic conditions and place different pressures on existing and new community services. Both ‘worst case’ scenarios are described in detail in Table 12.15 (providing floorspace and unit number assumptions).

12.6.3 The employment assessment and estimates of population and child yield use these scenarios as the basis for assessing the likely range of effects and their significance. The floorspace and uses on the Triangle Site are the same in both scenarios. The differences between them lie, therefore, on the Main Site, where the development specification would permit different combinations of floorspace and units, with different socio-economic effects.
12.6.4 King’s Cross Central would include maximum development of 742,275 sq m, of which a maximum of 24,000 sq m would be in the Triangle Site. Maximum floor spaces are specified for each land use. In order to assess the likely employment created from these land uses, the two scenarios applied are those that would give rise to the highest employment rate and the lowest employment rate respectively. Each is a ‘best case’ in some respects but a ‘worst case’ in others. For example higher levels of commercial development (and more jobs) would mean less housing and thus less affordable housing. Lower levels of commercial development and more housing would result in less local employment and fewer indirect economic benefits.

12.6.5 The maximum residential scenarios may be considered as the ‘worst case’ in terms of impact on local facilities, as they would involve the greatest increase in the local population. On the other hand, the minimum residential scenarios may be considered as the ‘worst case’ in terms of meeting housing need and facilitating neighbourhood renewal, as they would result in the smallest increase in additional housing units.

12.6.6 The assessment of employment generation from both construction and these completed development scenarios makes various assumptions about Deadweight, Displacement and Multiplier effects. The basis of these is explained in detail in section 12.7.

12.6.7 Businesses located on-site currently employ 200 people. Many of these businesses operate on short-term leases, which could be terminated at short notice before 2006/07. No information is available on when these leases will be terminated or renewed and therefore the ‘worst case’ scenario for loss of existing employment of 200 people is assumed.

12.6.8 In assessing the impact on community facilities it has been noted that the D1 and D2 floorspace applied for (110,815 square metres across the Main Site and Triangle Site) could readily accommodate a full range of new facilities. However, the use of this space for such facilities may not necessarily be the most efficient way to create and deliver new or enhanced services, as recognised in the Joint Planning and Development Brief at paragraphs 2.10.8, 2.11.5 and 2.12.4.

12.6.9 Consequently, though it is clear that the applicants envisage accommodating some new provision within King’s Cross Central, there is no detail at this stage and no specific commitments about particular new or enhanced facilities. The Main Site Development Specification paras 3.25 – 3.29 identifies the types of facilities that could be provided on the Main Site and para 6.15 states that thresholds for the phased delivery of community, health and education uses would be agreed with the LPA when outline permission is granted. Thereafter the level, mix, timing and delivery of new provision would be matters for agreement, as plans come forward for each major phase (para 3.26).

12.6.10 The Triangle Site application does refer specifically to a health and fitness centre, incorporating medi-centre facilities, a crèche and community facilities, but at this stage the applicants have in effect designed a flexible ‘box’, up to 3,500 square metres in floorspace, within which various uses and facilities could be provided, to be determined later.
12.6.11 The sense in this flexible approach is self-evident. It means that the applicants, local authorities and other service providers would have scope to decide later on the precise form of new provision within the Main Site, in particular, armed with the best information at the time. Nevertheless, it makes an assessment difficult. The applicants’ have set out a number of more specific intentions and aspirations within a submitted Implementation Strategy and indeed a Regeneration Strategy, however these are very much supporting documents and intentions and aspirations do not necessarily form the basis for a robust EIA.

12.6.12 As a result, within each individual topic area, this assessment identifies and assesses impacts initially assuming no additional provision. The assessment then considers how these judgements might be different with new or enhanced provision as part of the D1/D2 floorspace proposed. This second measure of impact is closely related to the measures described in the Further Mitigation section (12.8), which identifies some potential measures to address future needs arising from the King’s Cross Central development and to capture its full regeneration potential.

12.6.13 We have also assumed that the new principal public realm areas within King’s Cross Central (shown on, for example Parameter Plans KXC004, KXC006 and the Landscape Proposals Plans at Annex D to the Main Site Development Specification) would be managed and maintained to a very high standard, within a regime that provides for and promotes, public access. These are not matters laid down within the Development Specifications, which concentrate on the form of built development, nevertheless, the applicants intentions and commitments are clear from a range of publications concerning King’s Cross, in particular, the submitted Urban Design Statement and Public Realm Strategy. The Public Realm Strategy explains that:

“The key aim at King’s Cross Central is to ensure high quality public realm, managed and maintained responsively and effectively, to high standards” (Section 5)

12.6.14 It also explains that:

“Argent St George remain committed to a publicly-orientated management solution for King’s Cross Central. The developer …proposes to develop a model that addresses these concerns. This could mean local authority adoption of some areas of the public realm, once the development is complete, with some other areas remaining in private ownership, but with joined-up management standards and delivery across the whole development.”

12.6.15 The Strategy concludes with a commitment to enter discussions with the London Boroughs of Camden and Islington to debate different models for delivery and to find the best overall solution for management and maintenance of the public realm.

12.7 Assessment of Effects

12.7.1 Projecting impacts over the length of the development period combines a number of assessment techniques, including:

- analysis of historic social and economic trends in King’s Cross;
- comparison with other UK and international examples of similar scale developments and the impacts they have had on local people;
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- evidence drawn from recent trends in socio-economic change, drawn largely from studies undertaken by the Office of the Deputy Prime Minister, the Neighbourhood Renewal Unit and leading social researchers such as the Joseph Rowntree Foundation;
- consultation with key services and representative community groups; and
- consultants’ judgement, drawing on the experience of previous socio-economic impact assessments and recent experience of neighbourhood renewal and local economic development work.

12.7.2 The assessment considers the direct impact of development on the baseline socio-economic indicators and reviews the links between them to gauge the overall effect of impacts across a wide range of differing socio-economic issues.

Employment

Introduction

12.7.3 This section assesses the likely impacts of King’s Cross Central on employment. The proposed development would create a range of employment opportunities for people in the local area, wider central and north London area, and beyond. Employment and job creation impacts assessed in this analysis include:

- Construction employment impacts - jobs created during the construction of the development;
- Completed development employment impacts - jobs created once the development is completed and occupied;
- Multiplier Effects – jobs created as an indirect result of the development;

Direct Employment - Construction

12.7.4 Estimates of construction employment generated by development can be based on a jobs to cost ratio (i.e. the cost of the construction contract indicates how many jobs are generated). In this case estimates for construction costs have not been used. Construction employment generation has been estimated by comparing the scheme with other projects (Greenwich Meridian and Stratford City) and deriving an average job per floorspace ratio. This is set out in Table 12.12 below. In both cases estimates were based on GDP calculations.

12.7.5 Construction jobs are generally short term as different skills are required for different stages of the development. Therefore, employment estimates are reported as full time equivalents (FTE). For this assessment HM Treasury Guidance has been used which suggests that that one FTE job is equivalent to one person working for ten years or ten people working for one year. Caution should be exercised in quoting total numbers as it is unlikely that this number of people would ever be employed at any one time.
### Table 12.12 Construction Employment Densities

<table>
<thead>
<tr>
<th>Development</th>
<th>Total Maximum Floorspace (gross sqm)</th>
<th>Employment Density (Sqm per FTE employee)</th>
<th>Gross Construction Employment (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stratford</td>
<td>1,119,720</td>
<td>230</td>
<td>4,870</td>
</tr>
<tr>
<td>Greenwich</td>
<td>1,360,985</td>
<td>327</td>
<td>4,167</td>
</tr>
<tr>
<td>King's Cross Central</td>
<td>742,275</td>
<td>278 (average of 230 and 327)</td>
<td>2,670</td>
</tr>
</tbody>
</table>

**12.7.6** By applying 278 sqm per employee to the maximum floorspace proposed for King’s Cross Central (742,275 sqm), the gross full time equivalent jobs created would be 2,670. As part of this total the development specification for the Triangle site proposes a maximum of 24,000 sqm of new floorspace. This equates to 86 FTE jobs. The remaining 2,584 jobs (FTE) would arise from the Main Site development.

**12.7.7** Whilst the remainder of this report considers different ‘worst case’ scenarios for employment generation according to different land uses, the total floorspace constructed remains similar in each case, generating a similar quantity of construction jobs. Likely effects with and without the Triangle Site are also considered.

**Total Employment - Construction**

**12.7.8** As outlined in the methodology section, total net additional employment takes into account deadweight, displacement and multiplier effects. Assumptions made include:

- **Construction Deadweight Effects**
  
  It has been assumed that there are few deadweight effects (output which would have occurred without the development of King’s Cross Central) as there is no other major construction activity proposed for the area post 2006/2007. It is assumed that King’s Place, Regent Quarter and CTRL works will be complete or nearing completion by 2007.

- **Construction Displacement Effects**
  
  Displacement of construction workers from other projects occurs when skill resources are in short supply and the construction market is buoyant. Both of these issues are difficult to predict for 2007 and are largely subject to market cycles. However, it is estimated that there would be a ‘low’ level of displacement (defined as 25% by English Partnerships 2002) as labour would be released by the completion of CTRL, Regent Quarter and other major development schemes as work on King’s Cross Central begins.

- **Construction Multiplier Employment Effects**
  
  English Partnerships (2002) have concluded that major construction projects can indirectly generate significant additional employment in businesses that benefit from local spending of construction workers, and sub-contracts, services and supplies needed by the contractors and consultants involved.
The high accessibility of the site and the fluidity of the construction market in the south-east means that at King’s Cross these ‘multiplier’ employment effects are likely to be spread across London and possibly beyond. English Partnerships recommend that a multiplier of 1.5 is appropriate for calculating the scale of these effects across London (i.e. projects that are likely to have ‘regional’ impact).

12.7.9 Taking these assumptions into account, Table 12.13 below sets out the additional ‘multiplier employment effects’ and the effect of displacement on the total number of construction jobs created. Overall it is estimated that the total employment generated by the construction phase of King’s Cross Central, including the Triangle Site, would be 3,005 full time equivalent jobs across London.

<table>
<thead>
<tr>
<th>Table 12.13 Total Employment – Construction (Full Time Employment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Site (FTE) Without Triangle Site(FTE)</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Gross Direct Employment</strong></td>
</tr>
<tr>
<td><strong>Net Employment</strong> (deducting displacement)</td>
</tr>
<tr>
<td><strong>Indirect</strong> (applying multiplier)</td>
</tr>
<tr>
<td><strong>Total Employment</strong></td>
</tr>
</tbody>
</table>

Completed Development Employment

Direct Employment - Completed Development

12.7.10 Direct employment (Full Time Equivalent – FTE) generation is calculated using average density ratios. There are a number of sources for these and they vary according to the type of use and location. For the purposes of this study employment density means the average amount of floorspace (sqm) per full time equivalent job. Floorspace is defined as the internal area of the building in square metres.

12.7.11 English Partnerships’ (2001) guidance suggests that on average net internal floorspace is 80% of gross external floorspace. For residential areas, employment estimates have been based on the gross external floor spaces.

12.7.12 English Partnerships have recently (2002) re-evaluated employment densities for use in their schemes. This research provides the most up to date estimates and is used as the basis for most uses in King’s Cross Central. However, the GLA has also recently reviewed office employment ratios in London and concluded a Central London ratio that differs to the EP figure (1 job per 16sqm net lettable space compared to an EP range of between 16 and 22sqm internal floorspace per job). The GLA also suggest that densities may increase over time with the introduction of new technology (such as flat screens) and more efficient space planning. Given the Central London location and the appeal of new floorspace to occupiers wishing to access London and European markets the GLA ratio applied to net floorspace is considered appropriate to King’s Cross. The range of employment densities applied for King’s Cross Central are as set out in Table 12.14 below. These are explained in more detail in Appendix 12.A.
12.7.13

King’s Cross Central would include maximum development of 742,275 sqm (gross external), of which a maximum of 24,000 sqm would be in the Triangle Site part of the site. Maximum floor spaces are specified for each land use. To assess the likely employment created from these land uses, two scenarios have been applied which would give rise to the highest employment rate and the lowest employment rate. These scenarios are outlined in Table 12.15 below.

Table 12.15 High and Low Employment Floorspace Scenarios (Square Metres Gross External)

<table>
<thead>
<tr>
<th>Use</th>
<th>Main Site Low Employment Scenario (sqm)</th>
<th>Main Site High Employment Scenario (sqm)</th>
<th>Triangle Site (sqm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offices (B1)</td>
<td>400,000</td>
<td>486,280</td>
<td>0</td>
</tr>
<tr>
<td>Residential</td>
<td>176,875</td>
<td>125,000</td>
<td>18,000</td>
</tr>
<tr>
<td>Hotels</td>
<td>15,675</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A1, A2, A3</td>
<td>37,000</td>
<td>42,785</td>
<td>2,500</td>
</tr>
<tr>
<td>Community Facilities (D1)</td>
<td>42,350</td>
<td>22,560</td>
<td>3,500</td>
</tr>
<tr>
<td>Leisure (All D2)</td>
<td>22,000</td>
<td>17,275</td>
<td>0</td>
</tr>
<tr>
<td>Multi Storey Car Parks</td>
<td>23,850</td>
<td>23,850</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>525</td>
<td>525</td>
<td></td>
</tr>
<tr>
<td>Total Floorspace (sqm)</td>
<td>718,275</td>
<td>718,275</td>
<td>24,000</td>
</tr>
</tbody>
</table>

NB. The net internal figure is assumed to be 80% of the gross external figures stated above.
Appendix 12A sets out the direct employment generation of these scenarios using the density ratios above. On the Main Site it is estimated that the gross numbers of full time jobs would range from 22,138 for the low employment scenario to 26,436 for the high employment scenario, as set out in Table 12.16 below. Development of the Triangle Site would lead to an additional 148 jobs, implying a potential overall maximum of 26,485 jobs.

Table 12.16 Gross Employment Estimate

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Density (FTE per sqm net)</th>
<th>High Employment Scenario (FTE)</th>
<th>Low Employment Scenario (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Whole Site</td>
<td>Main Site Without Triangle Site</td>
<td>Whole Site Without Triangle Site</td>
</tr>
<tr>
<td>Offices (B1)</td>
<td>24,314</td>
<td>24,314</td>
<td>20,000</td>
</tr>
<tr>
<td>Residential</td>
<td>14</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>Hotels</td>
<td>0</td>
<td>0</td>
<td>157</td>
</tr>
<tr>
<td>A1, A2, A3</td>
<td>1,811</td>
<td>1,811</td>
<td>1,580</td>
</tr>
<tr>
<td>Community facilities (D1)</td>
<td>167</td>
<td>120</td>
<td>273</td>
</tr>
<tr>
<td>Leisure (D2 excluding cinemas)</td>
<td>Between 60 and 75*</td>
<td>134</td>
<td>180</td>
</tr>
<tr>
<td>Cinema</td>
<td>75</td>
<td>42</td>
<td>75</td>
</tr>
<tr>
<td>Multi Storey Car Park</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>26,485</td>
<td>26,436</td>
<td>22,287</td>
</tr>
</tbody>
</table>

Total Employment – Completed Development

As outlined in the methodology section, total net additional employment takes into account deadweight, displacement and multiplier effects. These effects are as follows:

- **Development Deadweight Effects**

  It has been assumed that the impact of deadweight (output which would have occurred without the project) would be minimal as there are no other current development proposals for the site.

- **Development Displacement Effects**

  Displacement impacts from the operational phase of the proposal can be assessed through two methods: (1) the displacement of existing on-site employment within the boundary of the applications and access roads; and (2) the displacement of off-site employment.

  It is estimated that 200 people would be working in existing businesses on-site when King's Cross Central construction starts. Therefore, for the purposes of the assessment, on-site displacement has been estimated at 200.
Displacement of off-site employment is also likely to occur, as the proposed development would provide uplift to the local economy. Evidence of this can be seen from other large-scale developments in London. The scale of displacement would be determined by the extent that the uses in King’s Cross Central compete with existing businesses and the impact of the development on nearby land values.

12.7.16 King’s Cross has a history of temporary and low cost uses, which is to a considerable extent the result of blight caused by the failure to develop the rail lands, stations and other development blocks for the last twenty years. Therefore many of the current businesses operating locally are taking advantage of rents kept low by the poor quality nature of premises, temporary leases and minimal investment. Businesses include local independent retailers, charities, storage and small workshop businesses (many of which have now gone from the site itself and the railway arches as a result of the CTRL works).

12.7.17 Many of the small businesses located in the Central Impact Zone similarly take advantage of low rent levels, short leases, and the large number of historic buildings with floorspace well suited to small business needs. Businesses include independent shops, car repairs and car parking, workshops and storage. There appears to be a large, diverse small business sector in the Central and Wider Impact Zones, operating successfully.

12.7.18 Some premises may be lost as land values rise and the incentive for reinvestment/redevelopment is increased. The employment calculations include an allowance for such displacement.

12.7.19 The Central and Wider Impact Zones already contain an array of commercial buildings. Very few office uses in the area, however, are likely to compete with those proposed in the King’s Cross Central proposals. The office buildings on Gray’s Inn Road, Euston Road and Pentonville Road predominantly date to the 1970s and struggle to meet modern office demands. Offices on the Holloway Road, in Islington and in Camden Town tend not to appeal to the Central London market.

12.7.20 Whilst any land value rises may give rise directly to redevelopment of out-of-date office accommodation close to the site, the effect on the stock further north is unlikely to be so significant. This assessment has therefore made some allowance for displacement of some employment from redeveloped stock. However, within the context of total employment in the area and the number of new jobs brought by King’s Cross Central (as set out below), the number of local jobs displaced from the Central or Wider Impact Zones is unlikely to be significant. Instead rising land values are more likely to result in the transformation of the wider area into a modern employment district for London.

12.7.21 In this context, King’s Cross Central would create high quality space for a range of employment and retail uses that would generally appeal to London wide or sub-regional markets. Studies examining retail impact have shown that there is sufficient capacity in the market for new development without detrimentally affecting the viability and vitality of existing centres.
The greater impact may arise from the 'ripple effects' that follow this investment and the development of the railway stations, Regent Quarter, King’s Place and other local schemes. It would be difficult to apportion which of these developments would have the greater impact on local values, but in combination they are likely to be of an order of magnitude to trigger and encourage reinvestment in land across the Wider Impact Area. As the largest development, it is anticipated that King’s Cross Central would have a greater impact than the others. Taking these factors into account we have assumed a conservatively high 25% employment displacement rate. Of course, replacement of low cost businesses with activities that may generate higher returns to cover increased rents may also mean higher income and better quality employment.

**Development Multiplier Employment Effects**

The level of economic activity proposed for King’s Cross Central would also deliver benefits from increased spend generated by new and increased wages of people working in the development and linkages with existing and new services and supply businesses. Evidence from previous studies of major developments in London (London Bridge City Phase II and Chiswick Park) suggests that the business linkage effects and employees’ local expenditure impacts can be significant. Again English Partnerships (2002) provide guidance on the multiplier effect, suggesting 1.5 for the effect across London (‘regional’ effects).

The table below (Table 12.17) shows the effect of displacement and multipliers on total employment numbers. It is estimated that total employment generated by the Main Site would be between 24,606 and 29,440 jobs for the low and high employment scenarios respectively, attaining a maximum of 29,496 with the development of the Triangle Site.

**Table 12.17 Estimated Total Employment from the Completed Development**

<table>
<thead>
<tr>
<th></th>
<th>High Employment Scenario (FTE)</th>
<th>Low Employment Scenario (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Whole Site</td>
<td>Main Site Without Triangle Site</td>
</tr>
<tr>
<td><strong>Direct Employment</strong></td>
<td>26,485</td>
<td>26,436</td>
</tr>
<tr>
<td><strong>Gross Additional Employment</strong> (deducting deadweight)</td>
<td>26,485</td>
<td>26,436</td>
</tr>
<tr>
<td><strong>Net Additional Employment</strong> (deducting displacement)</td>
<td>19,664</td>
<td>19,627</td>
</tr>
<tr>
<td><strong>Total Employment</strong> (adding multiplier effect)</td>
<td>29,496</td>
<td>29,440</td>
</tr>
</tbody>
</table>
Local Employment

12.7.25 Existing local employment levels are very low (only 3% of the total jobs within the Central Impact Zone are currently estimated to have been taken by local people). This may be partly because the range of jobs on offer locally are often temporary, seasonal (hotel work) and low paid. However, work by the West Euston Partnership in 2000 also suggested that many of the larger local employers had poor perceptions of the skill levels and suitability of local people. This was despite surveys demonstrating good computer literacy amongst residents of the West Euston housing estates.

12.7.26 The large total numbers of new jobs that would be created, the diverse mix of employment uses and the longevity of investment at King’s Cross Central would lead to increased local employment levels, without any additional interventions to promote local employment (which could deliver additional/enhanced benefits), as discussed and assessed below.

12.7.27 The use of specific initiatives aimed at increasing demand for and supply of local labour (as discussed below in section 12.8) could have dramatic effect on local employment levels and help avoid the problems of past major (generally single-use) schemes which have been shown to cause resentment amongst local people, and further isolation from wider employment markets. This ‘postcode discrimination’ would, if not avoided/counteracted, be a potential source of increased social stress (affecting such diverse issues as health, income, travel and crime) on local people, as local services and facilities become heavily used by commuters and daytime workers.

Construction

12.7.28 Local employment generated from the construction work can be estimated indirectly by assessing employment that would be taken up by those residing outside the Impact Zones. The high accessibility of King’s Cross Central and the structure of the construction market means that a high proportion of the employment opportunities created during the construction phase could be taken up by individuals from outside the Central and Wider Impact Zones.

12.7.29 The construction workforce is highly mobile. This is particularly true of skilled construction workers (construction management, skilled technicians, and skilled trades workers) that typically comprise around 70% of the workforce for major construction projects. Evidence of other major construction projects (UK Research Partnership Ltd), suggests that construction projects that rely heavily on smaller sub-contractors are less conducive to aiding local employment than major projects using larger contractors. Larger contractors are generally more experienced in sponsoring local training and labour schemes (DTZ Pieda Consulting, 2003). The scale of the King’s Cross Central proposals means that it is likely that large contractors will be required and employed.

12.7.30 There are few residents in the Central Impact Zone and Wider Impact Zone currently employed in the construction industry, although recent attempts have been made to increase the proportion on CTRL, Regent Quarter and station developments. If successful these schemes would be finishing around the time of construction beginning on King’s Cross Central possibly resulting in the transfer of local, trained labour, with benefits for both local people and the King’s Cross Central development.

12.7.31 The nature of construction work means that employment generated and skills need would fluctuate over the development period. Nevertheless, the length of the King’s
Cross Central construction period means that there is the potential for the construction sector to become a long-term stable employment base within the local economy. The sector includes a range of occupation levels, including traditional unskilled, semi-skilled and skilled labouring, but also engineering, management and support functions including IT, personnel and others. The relatively high proportion of unskilled positions make it a good sector for low-skilled unemployed people to target.

12.7.32 Taking all these factors into account, and without any additional positive interventions, it is estimated that around 5% of the total workforce would be sourced from within the Central Impact Zone and 25% would be sourced from within the Wider Impact Zone. This gives rise to the estimates in Table 12.18 below, which applies the 5% and 25% rates to the figures in Table 12.13 above.

<table>
<thead>
<tr>
<th></th>
<th>Central Impact Zone (FTE)</th>
<th>Wider Impact Zone (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Whole Site</td>
<td>Without Triangle</td>
</tr>
<tr>
<td>Direct Local Employment</td>
<td>134</td>
<td>129</td>
</tr>
<tr>
<td>Total Local Employment</td>
<td>150</td>
<td>145</td>
</tr>
</tbody>
</table>

12.7.33 Whilst many of those benefiting are likely to move on to other jobs at some stage, King's Cross Central would offer a more secure grounding in a diverse range of skills and experience than most other projects in the UK.

**Local Employment - Completed Development**

12.7.34 There are a number of factors that are likely to constrain local employment take up of employment opportunities within the completed development:

- **Lack of skilled workers**

  A high proportion of residents in the area have a lack of skills, excluding them from many of the jobs that are likely to become available at King's Cross Central. A training audit undertaken for the Camden Central Partnership SRB programme noted that the courses that are most commonly over subscribed are English as a second or other language (ESOL), childcare, and IT training. The report noted that two of the main barriers to local employment are the lack of English speaking skills and access to childcare, suggesting that with improvements in these skills (e.g. through the measures discussed in Section 12.8 below) employment in other sectors may also rise.
High accessibility

King's Cross is one of the most accessible locations in London and England as a whole, due to its location and role as a major public transport hub. Its accessibility will increase with current rail and underground improvements. Jobs created locally would therefore be open to competition from a large proportion of the south-east labour pool. For local people to access jobs they would need to demonstrate a comparable level of education, skills and competency to those from other communities.

12.7.35 Nevertheless, the diversity of employment opportunities on the site means that there is considerable potential to increase the rate of local employment.

12.7.36 The development areas nearest to the transport interchange are likely to attract occupiers who demand high specifications and, in some cases, large floorplates. However, all of the office accommodation in this area would be capable of sub-division to meet demand for smaller units of accommodation.

12.7.37 To the north of the Regent’s Canal, there is likely to be a more eclectic mix of workspace accommodation, including accommodation that would enable occupiers to enjoy new, efficient but perhaps fairly basic accommodation. Such premises would appeal to small and medium sized businesses.

12.7.38 Thus, the proposals include scope for a range of different commercial building formats, with modern office floorspace suitable for a variety of businesses. The plots are designed to accommodate efficient, flexible buildings, which allow sub-division to cater for multiple lettings and a mix of large and small occupiers. Many of the historic buildings naturally lend themselves to floorspace layouts more suited to small companies and niche retailing.

12.7.39 The range of office and workspace types and scale of the ‘offer’, therefore combined with the opportunities for innovative, long-term management and ownership structures, would help create a vibrant, viable cluster for enterprise. In addition, the form of the proposed development and the wide range of business types that would be attracted to King’s Cross Central is likely to ensure the employment market is not dominated by single use occupational structures.

12.7.40 King’s Cross Central would create:

- entry level jobs for the unskilled and inexperienced;
- local employment opportunities that allow households to balance work/home time, allowing dual income earning households, through part-time working, flexible hours, second jobs and the ability to take-up ‘incentive benefits’ such as income support and tax credits;
- local jobs, which may be taken up by, people who are already working but who choose to upgrade their positions or wages, or who prefer to work more locally.

12.7.41 The semi-skilled, skilled and managerial positions are likely to be well represented in the office and business uses as well as retailing and leisure. This would significantly increase the number of middle income local households (see below) and offer a wide range of low skilled jobs.
Overall, around 5% of the jobs created could be expected to be taken up by residents in the Central Impact Zone, with a further 25% taken up by residents in the Wider Impact Zone. Estimates of local employment (direct and total) are indicated in Table 12.19, which applies the 5% and 25% rates to the figures in Table 12.17 above.

<table>
<thead>
<tr>
<th>Table 12.19 Local Employment - Completed Development (Whole Site)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Employment Scenario</strong></td>
</tr>
<tr>
<td>FTE</td>
</tr>
<tr>
<td>Central Impact Zone</td>
</tr>
<tr>
<td>Direct Local Employment</td>
</tr>
<tr>
<td>Total Local Employment</td>
</tr>
</tbody>
</table>

Development without the Triangle Site would have a minor effect on local employment generated as shown in Table 12.20.

<table>
<thead>
<tr>
<th>Table 12.20 Local Employment – Main Site Development without Triangle Site</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Employment Scenario</strong></td>
</tr>
<tr>
<td>FTE</td>
</tr>
<tr>
<td>Central Impact Zone</td>
</tr>
<tr>
<td>Direct Local Employment</td>
</tr>
<tr>
<td>Total Local Employment</td>
</tr>
</tbody>
</table>

Summary of Employment Estimates

A summary of estimated job creation (direct and total) from both the construction and completed phases of King’s Cross Central, and the amount of employment that would be accessed locally, is provided in Tables 12.21 and Table 12.22. It is estimated that total direct employment for the whole site development, including construction jobs would range from 24,957 to 29,155 full time equivalent jobs. Accounting for displacement and multiplier effects a range of between 27,778 and 32,501 full time equivalent jobs could be created.
Table 12.21: Summary of Employment Generated by King’s Cross Central (Whole Site)

<table>
<thead>
<tr>
<th></th>
<th>Whole Site High Scenario</th>
<th>Whole Site Low Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction Jobs</strong></td>
<td>Direct 2,670</td>
<td>Direct 2,670</td>
</tr>
<tr>
<td></td>
<td>Total 3,005</td>
<td>Total 3,005</td>
</tr>
<tr>
<td><strong>Completed Development Jobs</strong></td>
<td>Direct 26,485</td>
<td>Direct 22,287</td>
</tr>
<tr>
<td></td>
<td>Total 29,496</td>
<td>Total 24,773</td>
</tr>
<tr>
<td><strong>Total Jobs Created</strong></td>
<td>Direct 29,155</td>
<td>Direct 24,957</td>
</tr>
<tr>
<td></td>
<td>Total 32,501</td>
<td>Total 27,778</td>
</tr>
</tbody>
</table>

* High/low scenario does not apply

12.7.45 Development without the Triangle Site would have a minor effect on local employment generated (reduction of between 154 and 265 jobs) as shown in Table 12.22.

Table 12.22: Summary of Employment Generated by King’s Cross Central (Main Site without Triangle Site)

<table>
<thead>
<tr>
<th></th>
<th>Main Site Without Triangle Site High Scenario</th>
<th>Main Site Without Triangle Site Low Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction Jobs</strong></td>
<td>Direct 2,584</td>
<td>Direct 2,584</td>
</tr>
<tr>
<td></td>
<td>Total 2,907</td>
<td>Total 2,907</td>
</tr>
<tr>
<td><strong>Completed Development Jobs</strong></td>
<td>Direct 26,436</td>
<td>Direct 22,138</td>
</tr>
<tr>
<td></td>
<td>Total 29,440</td>
<td>Total 24,606</td>
</tr>
<tr>
<td><strong>Total Jobs Created</strong></td>
<td>Direct 29,020</td>
<td>Direct 24,722</td>
</tr>
<tr>
<td></td>
<td>Total 32,347</td>
<td>Total 27,513</td>
</tr>
</tbody>
</table>

12.7.46 Of the total jobs created across the Whole Site (including construction jobs), without intervention, between 8,334 and 9,751 jobs are likely to be taken by local residents in the Central and Wider Impact Zones (as shown in Table 12.23).
### Table 12. 23 Summary of Local Employment Generated by King's Cross Central (Whole Site)

<table>
<thead>
<tr>
<th></th>
<th>Central Impact Zone</th>
<th></th>
<th>Wider Impact Zone</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Whole Site</td>
<td>Whole Site:</td>
<td>Whole Site:</td>
<td>Whole Site:</td>
</tr>
<tr>
<td></td>
<td>High Scenario</td>
<td>Low Scenario</td>
<td>High Scenario</td>
<td>Low Scenario</td>
</tr>
<tr>
<td><strong>Construction Jobs</strong></td>
<td>Direct 134</td>
<td>Direct 134</td>
<td>Direct 668</td>
<td>Direct 668</td>
</tr>
<tr>
<td></td>
<td>Total 150</td>
<td>Total 150</td>
<td>Total 752</td>
<td>Total 752</td>
</tr>
<tr>
<td><strong>Completed Development Jobs</strong></td>
<td>Direct 1,325</td>
<td>Direct 1,114</td>
<td>Direct 6,621</td>
<td>Direct 5,572</td>
</tr>
<tr>
<td></td>
<td>Total 1,475</td>
<td>Total 1,239</td>
<td>Total 7,374</td>
<td>Total 6,193</td>
</tr>
<tr>
<td><strong>Total Jobs Created</strong></td>
<td>Direct 1,459</td>
<td>Direct 1,248</td>
<td>Direct 7,289</td>
<td>Direct 6,240</td>
</tr>
<tr>
<td></td>
<td>Total 1,625</td>
<td>Total 1,389</td>
<td>Total 8,126</td>
<td>Total 6,945</td>
</tr>
</tbody>
</table>

*High/low scenario does not apply

#### 12.7.47
Development without the Triangle Site would have a minor effect on local employment generated (reduction of between 47 and 80 jobs) as shown in Table 12.24.

### Table 12. 24 Summary of Local Employment Generated by King's Cross Central (Main Site without Triangle Site)

<table>
<thead>
<tr>
<th></th>
<th>Central Impact Zone</th>
<th></th>
<th>Wider Impact Zone</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Main Site Without Triangle Site</td>
<td>Main Site Without Triangle Site</td>
<td>Main Site Without Triangle Site</td>
<td>Main Site Without Triangle Site</td>
</tr>
<tr>
<td></td>
<td>High Scenario</td>
<td>Low Scenario</td>
<td>High Scenario</td>
<td>Low Scenario</td>
</tr>
<tr>
<td><strong>Construction Jobs</strong></td>
<td>Direct 129</td>
<td>Direct 129</td>
<td>Direct 646</td>
<td>Direct 646</td>
</tr>
<tr>
<td></td>
<td>Total 145</td>
<td>Total 145</td>
<td>Total 727</td>
<td>Total 727</td>
</tr>
<tr>
<td><strong>Completed Development Jobs</strong></td>
<td>Direct 1,321</td>
<td>Direct 1,107</td>
<td>Direct 6,609</td>
<td>Direct 5,534</td>
</tr>
<tr>
<td></td>
<td>Total 1,472</td>
<td>Total 1,230</td>
<td>Total 7,360</td>
<td>Total 6,152</td>
</tr>
<tr>
<td><strong>Total Jobs Created</strong></td>
<td>Direct 1,450</td>
<td>Direct 1,236</td>
<td>Direct 7,255</td>
<td>Direct 6,180</td>
</tr>
<tr>
<td></td>
<td>Total 1,617</td>
<td>Total 1,375</td>
<td>Total 8,087</td>
<td>Total 6,879</td>
</tr>
</tbody>
</table>

*High/low scenario does not apply

### Income and Unemployment

#### 12.7.48
As explained above, the local employment summarised in Table 12.23 would include a range of wage levels spread across a hierarchy of occupational positions, from unskilled to senior management. The maximum figure of 9,751 local jobs would have a sizeable impact, affecting between 10% and 20% of all household income levels.
12.7.49 The creation of employment opportunities close to home can have a dramatic impact on household livelihood, including saving on travel and care costs. They can also enable parents and carers with commitments at home to access work through travel time savings and flexible hours. The savings made by locally employed residents would directly increase the potential for local spend and household investment in improved social conditions.

12.7.50 Some residents that do take advantage of the new job opportunities would also create other opportunities for local people in the jobs they have left. In the case of upgrades, former jobs may be more suited to lower skilled, less experienced people and may match needs of some of the unemployed population (see below).

12.7.51 More generally, the creation of a more evenly spread ‘income ladder’ amongst households and the opportunity for workers to improve their occupational positions at King’s Cross Central, would immediately give rise to improved social conditions and economic stability, including greater use of transport and services (such as internet, insurance, bank accounts), improved health (see Health Specialist Report Part 13) and better education.

12.7.52 The consequential implications for unemployment are hard to gauge. Unemployment rates in King’s Cross are currently and have historically stayed consistently above national and London averages. Unemployment rates in London are currently very low and commentators have recently suggested that the UK is currently experiencing close to ‘full employment’ levels. This means that the current unemployed are amongst the very hardest to reach, requiring disproportionate levels of intervention and support to get them into work. This has been recognised by Camden and Islington Council’s in their support of projects targeted at specific excluded groups and recent support for Local Intermediate Labour Market Initiatives.

12.7.53 The local dominance of social housing tenures (see ‘Housing’ below) means that the local population would invariably continue to include a disproportionate number of people in most need of support, including unemployed, low wage earners and low income families. In addition, if current residents take advantage of higher wages or new employment opportunities and subsequently move out of social housing stock they are likely to be replaced by households in more need. As a result, it is unlikely that, without a restructuring of local housing markets, King’s Cross Central would dramatically reduce the local unemployment rate even though many individuals would benefit directly. A minor fall in unemployment is the most likely scenario, without wider structural changes (outside the control of the developer) and concerted positive action.

Assessment of Significance

12.7.54 The proposed development would therefore have a Major Beneficial impact in terms of job creation. New jobs created would vastly outweigh those displaced. Displacement of some existing businesses is expected as a result of rising commercial land values. However, this effect is only likely to be a Minor Adverse impact as there are few opportunities in the Central or Wider Impact Zones for large-scale redevelopments. Where redevelopment or rent increases do occur they are likely to be accompanied by higher quality, higher wage employment and greater security for employees (as longer term commitments are made to property). For example, the wider variety of commercial sectors likely to be attracted to King’s Cross Central would facilitate the diversification (and possible replacement) of existing ‘single sector’ employment sites such as Cedar Way and St Pancras Way Industrial Units.
12.7.55 At the same time, the creation of a new office/commercial cluster would encourage the redevelopment and refurbishment of antiquated, vacant, commercial buildings such as those on Pentonville Road, King’s Cross Road and Gray’s Inn Road. There are other potential development plots behind the British Library, at Vale Royal and along Market Road. These wider changes would spread employment opportunities and further transform the area into a modern employment district for London.

12.7.56 With current low local employment rates it can be expected that new, more secure businesses would increase local employment levels. With improved quality of employment this would result in significant net benefits for local people. Therefore the development would have a Moderate Beneficial impact on local employment and help reduce local unemployment, offering a wide range of employment opportunities across a diverse variety of sectors, including entry-level positions that would provide opportunities for the unemployed, more senior positions that would enable career progression of those already in work, and high-level professional/managerial positions. However with positive intervention this effect could be enhanced. This is discussed in the Further Mitigation section below.

12.7.57 The number of local jobs created would significantly increase the potential total ‘spend’ in local services, businesses and shops, enabling them to increase income and possibly expand and improve. There would be a Moderate Beneficial impact on local income levels, with far-reaching implications for the local economy and individual social and economic circumstances. However, as with unemployment levels, the extent to which these positive impacts are retained locally would depend on the future stability of the population and the structure of the local housing market.

12.7.58 The construction phase of the development is likely to generate local employment and increased income for up to 900 local people across the Central and Wider Impact Zones. This would be a Minor/Moderate Beneficial effect.

**Effects without the Triangle Site**

12.7.59 The overall assessments of significance set out above would be the same without the Triangle Site development. This is because in relative terms the employment related socio-economic effects of the Triangle Site development are quite small.

**Housing**

*Introduction*

12.7.60 King’s Cross Central may provide new homes for over five thousand people, in social, intermediate, other low-cost and open market housing. This section analyses the likely impacts of the proposed housing in relation to its quantity, size and tenure and the influence it is likely to have on the baseline conditions described above. It also assesses the potential population increase in the area as a consequence of the housing element of the development. It does not discuss the social, economic or cultural implications of this increase as these are addressed in other sections of the assessment.

12.7.61 This assessment is based on the proposed residential elements of the Planning Applications and the baseline conditions forecast by the study team.
Scenarios to be tested

12.7.62 The housing element of the King’s Cross Central proposal is a significant part of the scheme. The actual number of residential units is yet to be finalised, so for the purposes of this assessment minimum and maximum scenarios are tested.

12.7.63 The minimum residential component on the Main Site (within Camden borough) would be 1,600 units, up to a possible maximum of 2,300. For the Triangle Site there may be an additional 250 units, bringing the total residential component of the development to between 1,850 and 2,550 units. Taking these factors into account, there are four scenarios to consider, which may be summarised as follows:

- minimum residential development (1,850 units including the Triangle Site);
- maximum residential development (2,550 units including the Triangle Site);
- minimum residential development (1,600 units on the Main Site only); and
- maximum residential development (2,300 units on the Main Site only).

12.7.64 The maximum residential scenarios are the best case for housing supply but may be considered as the ‘worst case’ in terms of impact on local facilities and services, as they would result in the greatest increase in the local population. The minimum residential scenarios may be considered as the ‘worst case’ in terms of meeting housing need and facilitating neighbourhood renewal, as they would result in the smallest increase in additional housing units. However, they would have reduced impact on local services.

Housing quantity

12.7.65 In response to increasing demand for housing across Inner London, the London Plan (GLA, 2004) includes targets for housing development for each London borough. Between 1997-2016, Camden and Islington’s contributions are expected to be as follows (Table 12.25):

Table 12.25 Housing Targets for the London Boroughs of Camden and Islington

<table>
<thead>
<tr>
<th>Borough</th>
<th>Minimum new homes required, 1997-2016</th>
<th>Minimum required per annum, 1997-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camden</td>
<td>16,940</td>
<td>850</td>
</tr>
<tr>
<td>Islington</td>
<td>18,070</td>
<td>900</td>
</tr>
</tbody>
</table>


12.7.66 The proposed development would create between 1,850 and 2,550 new units. The Main Site would provide between 9.4% and 13.6% of Camden’s new homes required before 2016. Additionally, the Triangle Site would contribute to the Islington targets, albeit to a lesser degree (1%).
**Housing size**

12.7.67 As discussed in section 12.4, the population of the Central Impact Zone is expected to grow steadily in the foreseeable future, with the greatest growth in the age groups most likely to form small households (15-24 and 40+ years old). However, significant growth among local ethnic minority populations, especially the Bangladeshi community, is also expected to generate demand for larger properties.

12.7.68 Providing a mix of property sizes can encourage long-term residence in an area. If there is a wide choice of property sizes, residents may be more likely to relocate within the neighbourhood than to move out when their needs change.

12.7.69 The size of the new units is likely to influence the demographic profile of the new residential population. In general, it is expected that the number of bedrooms would reflect the number of occupants, although a number may also seek to keep a spare room for visiting friends and family.

12.7.70 Within the overall residential provision, unit size would vary from studios and one-bedroom apartments to four-bedroom family properties. For the purposes of this study the following mix of sizes (taken directly from the Development Specifications) has been assumed:

For the first 1,600 units:

<p>| | | | | |</p>
<table>
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<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Studio/1 bed</td>
<td>40% (640 units)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td>2 bed</td>
<td>37% (592 units)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td>3 bed</td>
<td>18% (288 units)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv)</td>
<td>4 bed</td>
<td>5% (80 units)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For additional units on the Main Site:

<p>| | | | | |</p>
<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>v)</td>
<td>Studio/1 bed</td>
<td>45% (up to 315 units)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi)</td>
<td>2 bed</td>
<td>40% (up to 280 units)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vii)</td>
<td>3/4 bed</td>
<td>15% (up to 105 units)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the 250 units proposed for the Triangle Site:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Studio/1 bed</td>
<td>123 units (49%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td>2 bed</td>
<td>112 units (45%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td>3/4 bed</td>
<td>15 units (6%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The 2002 Housing Needs Survey indicated that Camden has a net affordable housing requirement of 7,137 units per annum, for the period 2002-07. Over half of the total shortfall is in 1-bedroom properties, although the greatest shortfall in relation to supply is in large family properties (4 bedrooms).

The maximum housing scenario would generate a total of 1,078 one bedroom units, 984 two bedroom units and 488 three and four bedroom units. This mix of unit sizes would provide many more smaller units (one and two bedrooms) than family sized accommodation meeting the current high demand for small units and reflecting the many factors that mitigate against providing significant quantities of family accommodation in Central London.

**Housing tenure**

Current housing choice in King’s Cross tends to be bi-polar; a large proportion of low cost social housing, interspersed with pockets of high cost owner occupied and private rented accommodation. For those whose incomes fall outside the very narrow eligibility criteria for social rented housing, King’s Cross is not currently an affordable option for housing.

The Central Impact Zone is currently dominated by social rented housing: as discussed in the Baseline section above, over 40% of homes in the Central Impact Zone are rented from the Council, with an additional 18% rented from Registered Social Landlords (RSLs). Compared with pan London data, this is more than double the average concentration of social rented accommodation. The close proximity of several large housing estates to the site, dominated by social renting tenures, means that the percentage is likely to be much higher (approximately 70%) within a one mile radius of the site.

The final tenure balance in the proposed development is likely to influence the demographic, cultural and economic profile of the new residents. Without knowing the detailed proportions of affordable/low-cost and market housing, it is difficult to predict the likely impacts. However, in areas with high proportions of rented housing, there can be increased issues of long-term care of property, as rented (and bought-to-let) properties tend not to be looked after as carefully as those which are occupied by the owners. In areas with high proportions of social rented housing, there are often issues associated with low income level groups. These include health, crime, pressure on services and educational under-achievement.

This may mean that whilst increased numbers of affordable housing units would help to address a local housing shortage, they may also give rise to negative impacts on local public services and social and economic conditions for existing residents.

The actual proportions of market and affordable/low-cost housing to be provided on site are yet to be finalised. The applicants have stated that

“The delivery of affordable/low-cost housing would depend upon the necessary commercial arrangements and public subsidies being in place at each stage of the project and these are complex matters, for detailed discussion and agreement between the parties” (King’s Cross Central Implementation Strategy April 2004)
12.7.78 Camden and Islington Councils’ Joint Planning and Development Brief 2003 states:

“…. that of the first 1000 additional units within the Area, 50% should be affordable, apportioned as 35% social housing for rent and 15% for essential workers and other intermediate occupiers. For units over and above the first 1000 additional units the Council has a target of 50% affordable housing, this should include a significant element of social housing for rent and housing for essential workers but may also include other forms of low cost housing. In assessing proposals against this policy, the Council will take into account the London Plan, prevailing UDP policies, other relevant policies, local and/or London-wide housing needs, the wider regeneration needs of the King’s Cross area, economic circumstances and other material considerations. As Islington’s UDP (2002) currently has a 35% affordable housing policy, affordable homes provision in the Triangle will be apportioned according to the prevailing UDP policies.” (King’s Cross Opportunity Area Planning & Development Brief, London Boroughs of Camden and Islington, December 2003).

12.7.79 Table 12.26 examines two contrasting scenarios for affordable/low-cost housing: the first at 50% overall and the second at 30%. The first scenario would deliver between 925 and 1,275 affordable/low cost units across the Main Site and the Triangle Site. At the lower level of 30% between 555 and 765 affordable/low cost units would be created in total (across both parts of the site).

<table>
<thead>
<tr>
<th>Scenario</th>
<th>50% affordable/low-cost</th>
<th>30% affordable low-cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum dwelling numbers (main site only)</td>
<td>800 (50%)</td>
<td>1,600 (70%)</td>
</tr>
<tr>
<td>Maximum dwelling numbers (main site only)</td>
<td>1,150 (50%)</td>
<td>2,300 (70%)</td>
</tr>
<tr>
<td>Minimum dwelling numbers (including Triangle)</td>
<td>925 (50%)</td>
<td>1,850 (70%)</td>
</tr>
<tr>
<td>Maximum dwelling numbers (including Triangle)</td>
<td>1,275 (50%)</td>
<td>2,550 (70%)</td>
</tr>
</tbody>
</table>
Summary of housing impacts

12.7.80 The proposed development would:

- provide between 1,600 and 2,300 new homes on the Main Site (with up to an additional 250 on the Triangle Site), reintroducing a 24-hour residential presence in the area;

- create somewhere between 555 and 1,275 affordable/low-cost units across the Main Site and the Triangle Site should the final agreed affordable housing proportion fall within the scenarios assessed in Table 12.23. It should be noted that this EIA assessment does not constitute a commitment to any particular level of affordable housing; that would depend upon further discussions;

- help to balance the tenure profile of the Central Impact Zone by introducing a significant mix of market and affordable/low cost housing in an area currently dominated by social rented property.

Assessment of Significance

12.7.81 Kate Barker’s Review of Housing Supply in the UK for HM Treasury (2004) has reported that:

“the [social sector] is increasingly housing more ‘other’ inactives (such as those who are permanently sick, disabled, full-time students or looking after the family or home and thus are not working)…far more of those leaving the sector are in full time or part time work, whereas far more of those entering the sector are either unemployed, retired or economically inactive.” (Barker Review Interim Report – Analysis, HM Treasury 2004).

12.7.82 In King’s Cross this means that public services that are already underperforming against national standards (such as some local schools) or struggling to meet needs (such as childcare or health services), are coming under ever-increasing pressure as more households in greatest need of these services come into social housing in the area to replace those who make less use of them.

12.7.83 The Camden Housing Strategy Update 2002 sees the housing component of King’s Cross Central as an opportunity to address local regeneration needs:

“One challenge with a long awaited development such as King’s Cross is how to effectively intermingle the regional new housing opportunity this presents with local needs…all the areas around need this development to be an effective intervention to help bring neighbourhood renewal with improved quality of life and opportunities” (Camden Council, Housing Strategy 2001-2005 Update, 2002).

12.7.84 In line with advice from Central Government and Camden’s Housing Strategy there is a need for a greater mix of tenures and more affordable housing in the King’s Cross area to provide greater choice for local residents, reduce pressure on local services and improve local socio-economic conditions.
The quantity of affordable/low-cost housing in the King’s Cross Central proposals has the potential to bring about important economic and social changes. Depending upon the level of affordable/low-cost provision and tenure profile within the development, King’s Cross would be large enough to act as a catalyst for the creation of an intermediate market in its own right and:

- the creation of a local ‘ladder’ of housing choice, offering a mix of affordable tenures, allowing residents in social housing stock to choose to move locally;
- encouragement to low and middle income workers to move to jobs within Camden and Islington and other Central London locations, helping public services to attract and retain staff;
- help stabilise transience in the local population by providing choice in the housing market, encouraging movement from inappropriate housing stock/tenure (freeing it up for others in need) and resulting in greater consistency in education, health care and other services;
- demonstrate the deliverability and advantages of this form of development; and
- introduce a new fluidity that could stimulate the local (and wider) housing market as a whole.

There would also be benefits in rebalancing local communities. Research by the Joseph Rowntree Foundation has indicated that extending the mix of tenures and incomes on social housing estates has led to higher levels of tenant satisfaction and a better reputation. In addition, where a greater proportion of affordable homes in mixed housing developments are in shared ownership the chances of successful market housing and the prospects for sustainable communities developing are higher.

Conversely, existing social housing residents may feel further polarised by the prices of the new open market stock if there is little ‘intermediate’ housing available to bridge the gap in prices. The Camden Neighbourhood Renewal Study (2000) revealed that many residents already felt they were unable to move locally due to unaffordable house prices and limited tenure choice.

Some existing local residents have expressed concerns about the perceived negative impacts of ‘gentrification’ - a term used to refer to the effects of some new development - rising land values, new housing and changing employment sectors. These changes can, as discussed throughout this report, lead to physical renewal, increased tax revenues, reduced crime, improved local services, increased social mix and population stability. On the other hand, there has been evidence in other locations of displacement, community conflict, increased crime and changes to local services.

The available literature indicates that the balance of effects is largely a factor of specific local circumstances. At King’s Cross, the physical form, social structure and land ownership patterns of the area provide inherent protections against these impacts. In particular, as noted above, the Local Councils and Registered Social Landlords own a very significant proportion of local housing stock. Their tenants would not experience the effects of any property price increases in owner occupied or private rented stock.

At the same time, increased land values could help Local Authorities and their partners redevelop and improve housing stock in need of refurbishment/replacement.

Depending upon the level of affordable housing and the tenure profile, therefore, the proposals would have Beneficial effects of at least Moderate Significance. The proposals
provide scope for a significant net increase in affordable/low-cost housing in the area, catering for identified housing needs of low income groups with wider, structural effects. However, lower levels of provision (for example, below 600 affordable/low-cost units) and a heavy bias towards social renting would reduce these effects to more minor significance.

**Effects without the Triangle Site**

12.7.92 It has not been possible to separately analyse the potential tenure mix on the Triangle site alone as affordable/low-cost housing quantum across the two sites have not been agreed yet. However, with only 250 of the potential 2,550 new homes being proposed the assessments of significance set out above would not change with development of the Main Site only. This is because in relative terms the housing related socio-economic effects of the Triangle Site development are a small part of what has been assessed.

**Estimated Residential Population**

12.7.93 Residential population estimates are usually crudely calculated using density ratios derived from Census data for comparable locations. In general, social housing tends to have higher density ratios than open market but unit type and allocation policies are also factors. Current densities in King’s Cross reflect the historic dominance of social housing tenures and limited open market housing. They are therefore higher than average, even for Central London, particularly in parts of Somers Town.

12.7.94 King’s Cross Central would introduce a better mix of open market, affordable/low cost housing. It would make a significant contribution to broadening the local housing market and increase affordable/low cost choices for local people. If well managed, the new housing should help to relieve some local overcrowding. In doing so, it could contribute to stability in the community, reducing transience and encourage longer-term investment in the area.

12.7.95 In meeting these objectives it is important for the social and affordable/low cost housing tenures to reflect similar population densities to the open market stock. The Stratford City EIA (Chelsfield et al, 2002) provides a useful guide to average densities for social and open market housing. These have been used to generate an average ratio for King’s Cross Central, as follows:

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>Number of Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bed Flat/Studio</td>
<td>1.25</td>
</tr>
<tr>
<td>2 Bed Flat</td>
<td>2.2</td>
</tr>
<tr>
<td>3 Bed Flat</td>
<td>3.15</td>
</tr>
<tr>
<td>3 - 4 Bed House</td>
<td>4.1</td>
</tr>
</tbody>
</table>

12.7.96 Using the unit size assumptions set out in 12.7.70 population generation estimates for the high and low scenarios are set out in Tables 12.28 – 12.31. The housing proposed in the
Planning Applications would introduce a population of between 3,338 and 4,678 people on the Main Site rising to between 3,785 and 5,125 people if the Triangle Site is developed.

Table 12.28 Minimum Housing – Whole Site (1,850 Units)

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>Main Site</th>
<th>Number of Units</th>
<th>Triangle Site</th>
<th>Total Number of Units</th>
<th>Resident Ratio</th>
<th>Total Number of Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bed Flat/Studio</td>
<td>40</td>
<td>640</td>
<td>123</td>
<td>763</td>
<td>1.25</td>
<td>954</td>
</tr>
<tr>
<td>2 Bed Flat</td>
<td>37</td>
<td>592</td>
<td>112</td>
<td>704</td>
<td>2.2</td>
<td>1,549</td>
</tr>
<tr>
<td>3 Bed Flat</td>
<td>18</td>
<td>288</td>
<td>15</td>
<td>303</td>
<td>3.15</td>
<td>954</td>
</tr>
<tr>
<td>3 - 4 Bed House</td>
<td>5</td>
<td>80</td>
<td>0</td>
<td>80</td>
<td>4.1</td>
<td>328</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>1,600</td>
<td>250</td>
<td>1,850</td>
<td>-</td>
<td>3,785</td>
</tr>
</tbody>
</table>

Table 12.29 Maximum Housing – Whole Site (2,550 Units)

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>1st 1,600 Sub-total</th>
<th>Next 700 Sub-total</th>
<th>Triangle Site</th>
<th>Total Number of Units</th>
<th>Resident Ratio</th>
<th>Total Number of Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bed Flat/Studio</td>
<td>40% 640</td>
<td>45% 315</td>
<td>123</td>
<td>1,078</td>
<td>1.25</td>
<td>1,348</td>
</tr>
<tr>
<td>2 Bed Flat</td>
<td>37% 592</td>
<td>40% 280</td>
<td>112</td>
<td>984</td>
<td>2.2</td>
<td>2,165</td>
</tr>
<tr>
<td>3 Bed Flat</td>
<td>18% 288</td>
<td>15% 105</td>
<td>15</td>
<td>408</td>
<td>3.15</td>
<td>1,285</td>
</tr>
<tr>
<td>3 - 4 Bed House</td>
<td>5% 80</td>
<td>-</td>
<td>0</td>
<td>80</td>
<td>4.1</td>
<td>328</td>
</tr>
<tr>
<td>Total</td>
<td>100% 1,600 100% 700</td>
<td>250 2,550</td>
<td>-</td>
<td>5,125</td>
<td>-</td>
<td>5,125</td>
</tr>
</tbody>
</table>
### Table 12.30 Minimum Housing – Excluding Triangle Site (1,600 Units)

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>% of total units</th>
<th>Number of Units</th>
<th>Resident Ratio</th>
<th>Total Number of Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bed Flat/Studio</td>
<td>40</td>
<td>640</td>
<td>1.25</td>
<td>800</td>
</tr>
<tr>
<td>2 Bed Flat</td>
<td>37</td>
<td>592</td>
<td>2.2</td>
<td>1,302</td>
</tr>
<tr>
<td>3 Bed Flat</td>
<td>18</td>
<td>288</td>
<td>3.15</td>
<td>907</td>
</tr>
<tr>
<td>3 - 4 Bed House</td>
<td>5</td>
<td>80</td>
<td>4.1</td>
<td>328</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>1,600</strong></td>
<td></td>
<td><strong>3,338</strong></td>
</tr>
</tbody>
</table>

### Table 12.31 Maximum Housing – Excluding the Triangle (2,300 Units)

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>1st Sub-total %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,600</td>
</tr>
<tr>
<td></td>
<td>Sub-total Units</td>
</tr>
<tr>
<td></td>
<td>Remaining %</td>
</tr>
<tr>
<td></td>
<td>Sub-total Units</td>
</tr>
<tr>
<td></td>
<td>Total No. Units</td>
</tr>
<tr>
<td></td>
<td>Resident Ratio</td>
</tr>
<tr>
<td></td>
<td>Total Number of Residents</td>
</tr>
<tr>
<td>1 Bed Flat/Studio</td>
<td>40</td>
</tr>
<tr>
<td>2 Bed Flat</td>
<td>37</td>
</tr>
<tr>
<td>3 Bed Flat</td>
<td>18</td>
</tr>
<tr>
<td>3 - 4 Bed House</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

12.7.97 The population figures generated in these scenarios are used in the remainder of this report to assess impacts on local services and community facilities.

**Education**

12.7.98 The residential component of the proposed development is likely to consist of between 1,850 and 2,550 new homes. If the Triangle Site was not developed then the residential component would be between 1,600 and 2,300 new homes. The educational requirements of this new population would depend upon the number of new resident children, their age and the capacity of existing services to accommodate more pupils.

12.7.99 Estimates of the number of children expected to live in the new homes created have been generated taking account of the expected size and number of units, and trend data that indicates typical numbers of children per household.
School Age Children

12.7.100 The London Research Centre (now part of the GLA) produces figures relating to the number of school age children likely to be accommodated in dwellings of various sizes, known as the child yield. The London Borough of Camden specifies these ratios in its Supplementary Planning Guidance on Education (Education Contributions from Residential Developments) as follows:

Table 12.32 Child Population Estimates By Unit Size

<table>
<thead>
<tr>
<th>Unit Size</th>
<th>Number of School Age Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bed</td>
<td>n/a</td>
</tr>
<tr>
<td>2 Bed</td>
<td>0.562</td>
</tr>
<tr>
<td>3 Bed</td>
<td>1.202</td>
</tr>
<tr>
<td>4 Bed</td>
<td>1.969</td>
</tr>
</tbody>
</table>

12.7.101 However, these yields are primarily used as a means of securing financial contributions from new market and intermediate development towards educational facilities. They are likely to take account of a number of factors that influence education economics rather than the actual number of children expected from a new housing development. 2001 Census figures provide an alternative and can be used to illustrate the typical age profile that might be expected in the Central and Wider Impact Zones.

12.7.102 The 2001 Census reports that 18.6% of the population of the London Borough of Camden were children, under the age of 18 years. The Camden Supplementary Planning Guidance yield figures would result in an estimated 25%.

12.7.103 The average household size in Camden is less than that of England and Wales, and a significantly higher proportion of Camden households are single residents and have less dependent children (ONS, 2001). The average across Camden will include households in commercial districts of Central London. Whilst King’s Cross Central would contain a high proportion of small households (in 1 and two bedroom properties) almost 20% of the proposed housing may be 3 or 4 bedroom units generating a less typical number of families than might otherwise be expected in such a central location in London.

12.7.104 Therefore for the ‘worst case’ assessment it has been assumed that 20% of the population would be children, to reflect the likelihood of King’s Cross Central generating more than the Camden average number of children in the Census data. This has been applied to the expected population across all housing tenure types (including affordable/low cost) and unit sizes.

12.7.105 Table 12.33 below shows the expected number of children from the development scenarios set out above.
Table 12.33 Minimum Housing – Whole Site (1,800 Units)

<table>
<thead>
<tr>
<th>Number of Housing Units</th>
<th>Estimated Total Number of residents</th>
<th>Estimated Number of children (Under 18 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,600</td>
<td>3,338</td>
<td>667</td>
</tr>
<tr>
<td>1,850</td>
<td>3,785</td>
<td>757</td>
</tr>
<tr>
<td>2,300</td>
<td>4,678</td>
<td>936</td>
</tr>
<tr>
<td>2,550</td>
<td>5,125</td>
<td>1,025</td>
</tr>
</tbody>
</table>

12.7.106 It is therefore expected that development of the Main Site and Triangle Site would generate a child population of between 757 and 1,025. If the Main Site were developed alone this would reduce to between 667 and 936.

Child Age Profile

12.7.107 The expected age profile for children living in King’s Cross Central has been derived using 2001 Census data for the London Borough of Camden, as shown in Table 12.34.

Table 12.34 Estimate of School Age Residents

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Residents aged 0-4 yrs (30%)</th>
<th>Primary school age residents 5-11 yrs (35%)</th>
<th>Secondary school age residents 12-18 yrs (35%)</th>
<th>Total under 18 years and under*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Site Only</td>
<td>200</td>
<td>234</td>
<td>234</td>
<td>668</td>
</tr>
<tr>
<td>Min residential (1,600 units)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Site Only</td>
<td>281</td>
<td>327</td>
<td>327</td>
<td>935</td>
</tr>
<tr>
<td>Max residential (2,300 units)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole Site (Including Triangle Site)</td>
<td>227</td>
<td>265</td>
<td>265</td>
<td>757</td>
</tr>
<tr>
<td>Min residential (1,850 units)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole Site (Including Triangle Site)</td>
<td>307</td>
<td>359</td>
<td>359</td>
<td>1,025</td>
</tr>
<tr>
<td>Max residential (2,550 units)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* these numbers vary slightly from tables in section 12.4 due to rounding.,
Impacts

12.7.108 In calculating the impact of the new child population on existing schools a crude assessment can be made by comparing numbers of children against the estimated school capacities in 2007. The worst case for these (see Baseline) is 235 surplus places in primary schools and 111 deficit in secondary schools.

12.7.109 When the anticipated child resident numbers are compared against the school surpluses/deficits already expected within the Central and Wider Impact Zones, this suggests the following outcomes in Table 12.32. However, caution must be exercised in using this assessment as a number of factors are likely to influence parents’ choice of school and future school capacity. For example:

- Camden’s School Organisation Plan (LBC, 2003b) indicates that the Camden deficit will be reduced by current plans to increase entry numbers at Haverstock School, which lies outside the Central and Wider Impact Zones, but there is no information on when this will occur;

- if local schools perform badly (and some are below average for England) parents may choose for their children to travel further to better performing schools;

- deficits in one school may not affect children who are within the catchment area of another. Catchment areas in Camden and Islington are very large, usually containing a number of secondary or primary schools to choose from.

12.7.110 Table 12.35 sets out the impact of the four residential development scenarios on local schools, assuming the worst case capacity scenarios in 12.7.108. It indicates that impacts on primary schools could range from between a surplus of 1 place to a deficit of 123 and for secondary schools between a deficit of 344 and 470.

Table 12.35 Estimated School Surplus / Deficit

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Primary school places (5-11 years)</th>
<th>Secondary school places (12-18 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Site Only</td>
<td>1 surplus</td>
<td>344 deficit</td>
</tr>
<tr>
<td>Min residential (1,600 units)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Site Only</td>
<td>92 deficit</td>
<td>438 deficit</td>
</tr>
<tr>
<td>Max residential (2,300 units)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole Site (Including Triangle Site)</td>
<td>30 deficit</td>
<td>375 deficit</td>
</tr>
<tr>
<td>Min residential (1,850 units)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole Site (Including Triangle Site)</td>
<td>123 deficit</td>
<td>470 deficit</td>
</tr>
<tr>
<td>Max residential (2,550 units)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12.7.111 The Environmental Statements for the Greenwich Meridian and Stratford City Planning applications suggest that a minimum threshold size for a new primary school is around 420 pupils (or two-form entry). The corresponding minimum size for a secondary school is quoted as around 900 pupils. This suggests that, even ignoring current surpluses in local primary schools the numbers of school age children generated by the development would be insufficient to warrant the need for new primary or secondary schools.

12.7.112 However, with deficits expected across secondary schools in 2007, King’s Cross Central is likely to add to current pressures on local schools seeking to accommodate increasing numbers of pupils. Pressure for additional capacity would be exerted across a number of schools and may be relieved by expansion and improvements to other schools outside the Wider Impact Zone.

Summary of education impacts

12.7.113 The proposed development could generate a child population of between 757 and 1,025 across the whole site, reduced to between 668 and 935 if the Triangle Site were not developed.

12.7.114 Comparing child numbers and estimated age profiles this could result in increased pressure on the capacity of local schools of up to 123 places in primary schools and 470 in secondary schools (including existing deficits).

12.7.115 The impact of children numbers below 4 years and their education/care is assessed in the Community Facilities section below.

Assessment of Significance

12.7.116 Whilst the development proposals are likely to place additional capacity pressures on local primary and secondary schools, these are not sufficient to warrant the need for new schools to be built. It is also difficult to predict where capacity pressures would be most acutely felt as parents choices of school are increasingly influenced by a variety of factors outside the developers’ control.

12.7.117 For this reason any measures taken to address additional demand would need to take account of educational resources available at the time and consider the most efficient use of facilities and resources across the Central and Wider Impact Zones as a whole.

12.7.118 Whilst there is sufficient D1 floorspace proposed to accommodate new education facilities there is little justification for this based on the capacity assessment for the development alone. Any such need would be generated in combination with other population generating developments in the wider area. Instead the expansion/enhancement of existing schools or the improvements of routes to, and performance of, schools more able to accommodate new pupils could accommodate new demand created by King’s Cross Central. In the absence of new facilities or resources to address this lack of capacity the impact on local educational resources would be Moderate Adverse. The Further Mitigation section considers the measures that could be taken to address this impact.
By contrast the development proposals are likely to have a positive effect on the performance of local schools, some of which currently struggle to meet target standards. Given the long construction period it is children who are currently attending schools that are likely to gain most from the employment and other opportunities generated. The applicants have already supported a number of projects in local schools, including South Camden Community and Elizabeth Garrett Anderson, and are likely to want to ensure that schools and higher education are at the centre of local regeneration initiatives as this will have a direct impact on the market ‘appeal’ of the development itself.

The Implementation Strategy submitted with the application describes the applicants’ intention to develop a ‘child friendly’ environment with play spaces (supported by a Play Strategy) and interactive features aimed at both leisure and educational pursuits. The Implementation Strategy also highlights the applicant’s discussions with a higher education facility and the links that this may have with other uses.

In addition the Implementation Strategy highlights the applicants wish to:

“see a visitor, education, sustainability, exploratory centre, within the development, just as soon as safe access can be established to a suitable site. This is likely to be a temporary building initially; one that can be moved / expanded as the development progresses. In due course, the centre may become a permanent feature of King’s Cross” (Implementation Strategy April 2004).

Many of the recent improvements in the performance of local schools have been linked to the ‘additional’ activities offered to pupils (and their parents) and the new links with leisure and community facilities and higher education which have been made possible by targeted regeneration programmes (such as the Education Action Zone and Sure Start).

Therefore it is likely that a combination of new leisure, community and employment facilities would have a beneficial impact on pupil and school performance locally. In addition, improved services and local facilities may encourage greater community stability and a reduction in population transience. This is a major factor affecting pupil performance and reduced incidence of pupils regularly moving schools would undoubtedly have a positive impact on performance.

Targeted correctly, in combination with the Local Education Authorities and other service providers the investment brought by King’s Cross Central could generate significant match funding for local education linked initiatives, encouraging a greater prioritisation of King’s Cross for strategic education budgets.

Therefore the impact of the development proposals on local educational performance is expected to be Moderate Beneficial rising to Major Beneficial if the applicants’ successfully develop some of the D1 floorspace for the uses proposed in the Implementation Strategy which are closely linked to schools and higher education.

Effects without the Triangle

It has not been possible to assess the child yield expected for development on the Triangle site. However, given the small number of family sized units (15 x 3 bedroom units) the assessment of significance set out above would not change significantly should the Triangle Site not be developed.
Community Facilities & Social Capital

12.7.127 The King’s Cross Central proposals include up to 75,765 sqm of community, health, education and cultural uses within use class D1 on the Main Site. 40,000 sqm of this floorspace is allocated to the Granary building (and adjacent offices), Transit Sheds and within the footprint of the Assembly Shed. Some of this space may be taken by a higher education institute, as discussed above although this is not certain/finalised at this stage and the application also provides for other options. The Development Specification lists the possible types of facilities that could be accommodated within the 75,756 sqm overall as follows:

- “Library facilities;
- Community centre facilities;
- Youth facilities;
- Primary health care and support facilities;
- Day care facilities;
- Day nursery facilities;
- Primary school provision;
- Higher education colleges;
- Visitor/tourist information centre;
- Industrial heritage and other museums;
- Art galleries/visual arts centre/exhibition space;
- Enhanced facilities for boat users”.

12.7.128 The Main Site would also include up to 31,550 sq.m of assembly and leisure uses (such as concert halls, nightclubs, gymnasiums, sports centres, and a cinema).

12.7.129 In addition, 3,500 sq.m of floorspace is proposed for D1 and D2 uses on the Triangle Site. It is envisaged that this could include:

- a health and fitness centre. The application provides flexibility so that the centre could accommodate either a swimming pool or a sports hall, as part of the range of facilities provided;
- a medi-centre providing surgery facilities with an associated community room/space;
- a crèche facility.

12.7.130 The right mix of community and leisure uses can have a dramatic effect on the choices available to local people and opportunities for interaction and activity. These components are fundamental to improving the ‘social capital’ of communities.
12.7.131 There are few tangible measures of social capital (some are explored further in the Health Specialist Report Part 13). The World Bank defines it as “the institutions, relationships, and norms that shape the quality and quantity of a society's social interactions... Social capital is not just the sum of the institutions which underpin a society – it is the glue that holds them together” (The World Bank 1999). In this respect the ‘right’ mix of uses cannot be determined by traditional measures of capacity or population linked thresholds. Consideration of uses should carefully balance existing levels of social capital and the infrastructure that supports it with the need to use new facilities and activities to foster the ‘seamless’ integration of new communities that would be generated by the development proposals with this existing structure.

12.7.132 Robert Putnam (2000) argues that “in high social-capital areas public spaces are cleaner, people are friendlier, and the streets are safer. A growing body of research suggests that where trust and social networks flourish, individuals, firms, neighbourhoods, and even nations prosper economically. Social capital can help to mitigate the insidious effects of socio economic disadvantage” (Putnam, 2000). Therefore another impact to be assessed is the effect that the development would have on existing community structures and relationships that make up 'social capital'.

12.7.133 In King’s Cross there is evidence of strong social capital within small communities but also significant indications of distrust, animosity and wide discrepancies in levels of participation and social inclusion. There are numerous different communities within the Central and Wider Impact Zones linked together by diverse bonds such as religion, ethnic origin, place of residence, place of work, social clubs or travel needs.

12.7.134 King’s Cross Central could offer facilities that provide important elements in developing stronger social capital, across existing community boundaries. The proposals present a permeable form of development, open to the public, without the gates and barriers that have characterised some major schemes in the 1990s. Neighbouring residents would be able to take full advantage of new services and facilities, shops and employment.

12.7.135 In that context, new meeting places and focal points for communal activities (such as concerts, sports, museums, learning and attractions), within the development or investment in neighbouring places in Camden or Islington, open to new and existing residents, could encourage new relationships and increased integration. Local employment in King’s Cross Central and a range of public facilities may also foster greater pride in the development as a focal point for communities. The space dedicated to D1 and D2 uses in the Planning Applications could accommodate a wide range of community uses that would contribute to building social capital.

12.7.136 Issues contributing to achieving strong Social Capital are considered below. The significance of each is considered under the individual topic headings and an overall conclusion is made under the ‘Assessment of Significance’ Heading.

Shops and Leisure

12.7.137 Camden Council reports that local people place “liveable/friendly spaces for residents and commuters - supermarkets/ shopping/ restaurants/ bars/ pubs” and “a cinema/theatre” as the seventh and eighth priority for King’s Cross Central. (Camden Council’s King’s Cross Forum website 2003). The submitted applications provide for all these priorities to be met.
12.7.138 Whilst the shops proposed in King's Cross Central would provide direct benefits (in the form of jobs and local services), some residents have expressed fears that they may threaten existing local businesses. However, Brindleyplace, Birmingham and Gunwharf Quays, Portsmouth are two examples where the new shops and restaurants have actually led to an improvement in business for existing shopkeepers and a rise in quality and choice overall.

12.7.139 Pre-application consultation by the Local Authorities and the applicants suggests that the introduction of new shopping and leisure facilities to the area is perceived as a need and benefit by local residents. Furthermore, the Retail Impact Assessment concludes that King's Cross Central would result not in the loss of trade from existing local centres, but a 'clawing back' of some trade from centres such as Brent Cross and the West End which currently enjoy the business of Camden and Islington residents (Arup, 2004).

12.7.140 Therefore the Retail and Leisure components of the scheme are likely to have a Major Beneficial Impact on the social capital of large parts of the surrounding communities in the Central and Wider Impact Zones.

Child Care

12.7.141 Adequate Child Care is a major factor in allowing parents to take up employment opportunities and participate in activities that build social capital. Table 12.31 indicates that the number of under five year olds resident at King's Cross Central is likely to range from 200 to 307 children depending on the degree to which the residential element of the proposal is maximised. Due to differing staffing and nursery facilities it is important to assess the numbers in each age group that could be expected. For the purposes of this assessment it is assumed that there would be an equal number of 0, 1, 2, 3 and 4 year olds, which equates to between 40 and 61 children of each age.

12.7.142 The likely implications of this number of children on staffing resources is set out below:

- for children under 2 years old one carer per three children is required (by OFSTED) giving rise to a need for facilities to accommodate up to 20 staff;
- up to three nursery classes (for 3-4 year old children) could be generated with one teacher and nursery nurse per 25-30 children (up to 3 staff);
- for other childcare facilities (such as crèches) the staffing requirement would be 13 - 18 staff, based on the OFSTED standard of one staff member per eight children.

12.7.143 As indicated in the baseline (section 12.4) it is anticipated that there will be a borough-wide surplus of 661 places in nursery provision (3 - 4 years) by 2006/07. This would be sufficient to absorb the new resident 3 - 4 year old population and would only reduce the borough’s estimated surplus by a quarter. However, this assumes that some of the borough’s surplus places are within close proximity to King's Cross Central and that the places are affordable, which may or may not be the case.

12.7.144 There is no information available on the capacity of provision for under-three year olds in the Central and Wider Impact Zones by 2006/7. However, the baseline indicates that there is a current shortage in the wards of St. Pancras, Camden, Holborn and Regent’s Park. Therefore, it is unlikely that existing facilities could absorb the new under-three population without expansion.
Part 12 – Socio-economic Specialist Report

12.7.145 The Triangle Site includes proposals for a crèche and other community facilities which could be used for childcare. In addition, the Implementation Strategy for the Main Site states:

“The applicants are keen to continue working closely with Camden and their preferred partner for child care in the King’s Cross area, the Coram Family, to ensure that the development incorporates first rate child care facilities.” (Implementation Strategy April 2004).

12.7.146 Therefore it is assumed that some of the D1 floorspace applied for and the crèche proposed on the Triangle Site would provide some childcare facilities for every age group under 4 years old. It is difficult to judge whether new provision would be adequate to ensure pressure on existing facilities is not increased. The provision of new facilities would have a major impact on the ‘social capital’ of the new population but, as a ‘worst case’, there may be only a Negligible to Minor Beneficial impact on neighbouring communities due to the specific communities they would serve. These beneficial impacts could be enhanced to Moderate or Major Beneficial if facilities were also made available to existing local residents and workers.

*Community, Cultural and Leisure Centres*

12.7.147 The need for meeting places and new community halls is difficult to determine by common standards in such a complex urban environment. One approach suggests a community hall of 220 sq. m per 3,600 residents (Milton Keynes District Council, 2002). The average size of community centres in the area ranges from 110 sq. m for tenant halls, to 370 sq. m for community centres (CAG, 2001). On this basis one facility at the average King’s Cross size for larger community facilities (370 sq. m) is likely to be sufficient for new residents. However, this approach fails to take into account the existing range of facilities offered and specific needs of specific parts of the community. For some, gymnasiums or bars are considered more appropriate communal facilities than community halls.

12.7.148 The community facility (shared with the sports centre) proposed on the Triangle Site could be adopted to meet a wide range of community needs with other A3 and leisure uses on the Main Site and Triangle Site offering the range of communal spaces sought by different communities. These facilities are likely to be open to all members of the public and can therefore be judged as new ‘social capital’ assets for the wider population as well as the residents and workers of King’s Cross Central.

12.7.149 Therefore with inclusion of a range of communal meeting places, including a dedicated community facility as well as a range of other more leisure or recreation oriented spaces within the development, the effect on existing communities could be Moderate Beneficial.

12.7.150 If the Triangle Site was not developed it would be important for an equivalent community facility to be accommodated on the Main Site or existing facilities off-site to be enhanced to retain the likely Moderate Beneficial Impacts.
Open Space

12.7.151 King’s Cross Central would include approximately 10.2 hectares of principal public realm as indicated in Parameter Plan 004. This would form a series of linked public realm through the site. The Planning Applications and accompanying Landscape Proposals Plans indicate that it would include parks, squares and other principal public realm areas. A variety of different spaces would be created to meet the varying demands of the new population, together with enhancements along the Regent’s Canal.

12.7.152 Additional local amenity/play space would be provided within individual development zones, for the benefit of residents and potentially others. Specific locations and design solutions cannot be fixed at this stage (Main Site Development Specification paragraph 4.15). The Triangle Site, however provides a ready example of how local amenity spaces would be planned alongside the configuration of development blocks in each part of the development (Triangle Site Development Specification, paragraph 3.18 and Plan TS006).

12.7.153 It is anticipated that the greatest demand would be for informal space to gather, sit and relax as this would be required on a daily basis by both the working and resident population. There would also be demand for play space for the resident child population. Both these types of open space would serve a local on-site function. These uses would be accommodated within the public realm provision and within the various development zones as described above.

12.7.154 Ultimately the development is rightly conceived as ‘stitching in’ to a network of existing provision, such that King’s Cross Central residents would use other spaces in the area and existing communities would have access to King’s Cross Central.

12.7.155 There is little information available on current use patterns for existing open spaces in the area. There are a large number of open spaces within the Central Impact Zone serving a variety of purposes. Some of these spaces have been neglected in recent years and contribute to poor public realm conditions that can influence local deprivation and quality of life. Other spaces, like Regents Park, have seen significant recent investment and provide unparalleled sports, recreation and leisure facilities. Quality is often the determinant of demand for open space and it cannot be assumed that because a space is well or over used that there is a local deficiency in supply. It may simply mean that other spaces are not as well managed, or in the same condition or are difficult to access.

12.7.156 Therefore the demands placed on local open spaces by new residents or workers would not necessarily lead to increased deficiency. King’s Cross Central would begin to break down the barriers around the site, with a new hierarchy of streets, squares and other spaces, to permeate the site and link it to the east and west. There would be high quality linkages between open spaces, centres of activity and services. There would be routes that have never existed before, linking areas that have previously involved multiple transport changes and inhospitable walking routes. The development can therefore be seen as adding to a local network of open spaces and further increasing the variety of facilities and functional space on offer to all residents. For example, walking through King’s Cross Central would halve journey times to Bingfield Park for Somers Town residents.
12.7.157 In summary, it is considered that with on-site provision of informal open space and play areas, and access to sports facilities, as proposed for the Triangle Site, the proposal would not place significant additional demand on existing open spaces. The proposed development would address an area of open space deficiency and would act as a link between open spaces that surround the site.

12.7.158 Whilst the range of open spaces and public realm proposed on the Main and Triangle Sites may not make up fully for existing ‘open space deficiency’ King’s Cross is no different from any other Central London location in this respect and there are of course many competing pressures on the development. Nevertheless, the opportunity has been taken to create a wide range of different space offering differing activities to different members of the community and links with other existing local parks and open space areas.

12.7.159 In this respect the choice and quality of open space offered to local communities in the Central and Wider Impact Zones would be vastly improved resulting in a likely Major Beneficial Impact.

Assessment of Significance

12.7.160 Overall the mix and range of community and leisure facilities offered in King’s Cross Central are likely to have a Major Beneficial Impact on the social capital of communities in the Central and Wider Impact Zones. The uses proposed would add a choice of activities and opportunities never before available to many members of neighbouring deprived communities. Improved social capital is likely to be a major contributor to regeneration in the area, with knock-on effects on health, income, employment and education.

12.7.161 However, careful consideration of the location and size of new facilities would be required if the beneficial impact on social capital is to be maximised. Too many facilities located within the site may create perceptions of ‘exclusivity’ amongst existing communities, discouraging use. Conversely, investment in inappropriate facilities outside the site boundary would do little to encourage new residents to use them.

12.7.162 A more sustainable approach could balance the current community ‘asset’ base with the immediate and localised needs of new residents. To this end, there is little point in duplicating those successful facilities that are already provided locally. Some of these could be enhanced to accommodate the needs of new residents and employees and contribute to wider integration (for example secondary schools, community centres, open spaces, and religious meeting places). There are other assets that currently struggle to meet current needs (let alone the demands of new residents) and could benefit from more provision within King’s Cross Central. By focussing on development of these facilities King’s Cross Central could make a major contribution to the improvement of local community resources. This issue is discussed in the Further Mitigation section.

12.7.163 The assessment of significance set out above would continue to apply to development of the Main Site only. This is because in relative terms the socio-economic effects of the Triangle Site development on community facilities and social capital are relatively small, albeit the proposals make provision for specific D1/D2 uses. The Main Site proposals include substantial levels of D1/D2 floorspace in any event.
Crime and Community Safety

12.7.164 Crime, the fear of crime and community safety are important issues for local people. Yet the current crime profile of the King’s Cross area is complex and perceptions of high crime levels are often not borne out by recorded crime statistics. To this end the image of a place, the sense of safety, vigilance and activity can significantly contribute to improved social capital, often more than a reduction in crime levels themselves. Improving the attractiveness of public spaces serves to encourage increased levels of use, especially where new spaces are furnished with facilities such as cafes or concert spaces. This fosters a level of vitality in the area, which in turn, encourages more people to visit, turning the ‘space’ into a ‘place’. This increased vitality in regenerated areas encourages stewardship, vigilance, better maintenance and reduced crime and anti-social behaviour.

12.7.165 By designing out opportunities for crime in King’s Cross Central itself there is a danger that new criminal activity would take place on its boundaries. However, King’s Cross Central includes a number of new pedestrian and vehicular routes designed to ensure maximum connectivity with centres of activity and desire lines that naturally encourage movement on and off-site. The creation of new active frontages onto the Canal and routes out of the site would also increase overlooking and vitality to help ensure people feel safe and encourage use.

12.7.166 In addition, with the levels of management referred to in the Regeneration Strategy and other documents supporting the planning application, King’s Cross Central is likely to reduce demands on the police allowing more efficient policing of areas outside its boundary. The Metropolitan Police are currently actively encouraging the Councils and other local landowners to review and remove physical opportunities for criminal activity in nearby estates and commercial areas. If undertaken in parallel with King’s Cross Central, this is likely to result in a net decrease in criminal activity across the Central Impact Zone as whole.

12.7.167 Any displacement of criminal activities outside the site boundaries is likely to be sporadic and isolated to opportunity areas. It is unlikely to affect the Central or Wider Impact Areas as a whole. In addition the improved image (from the current negative perceptions of crime in the area) created by the development itself is likely to ensure the fear of crime potentially derived from these isolated occurrences is outweighed by positive perception changes across the area as whole.

Assessment of Significance

12.7.168 Kings’ Cross Central would represent a dramatic change to the local environment and the removal of some ‘hotspots’ for criminal activity. The high level of management that would follow the quality of design and landscaping in the proposals and ‘stewardship measures’ described in the Regeneration Strategy are likely to have a Major Beneficial impact on perceptions of the wider King’s Cross area, not just the area within the development boundary.

12.7.169 The effect of enhancing the King’s Cross Central environment, in combination with the other developments in the area is likely to reduce overall crime levels in the area as a whole as the opportunities for criminal activity (vacant premises, unoccupied streets and obscure hiding places) are removed and the image of the area is lifted. Drug and prostitution related crime may be displaced but there is little evidence to show that it is more likely to occur elsewhere in the area than somewhere else in London. Equally construction activity on the site is unlikely to have any greater displacement effect than
2007 levels as very little criminal activity takes place on the site at present. Therefore the effect on King’s Cross can be considered to be **Major Beneficial**.

**Effects without the Triangle Site**

12.7.170 The assessment of significance set out above would continue to apply for development of the Main Site only. This is because in relative terms the socio-economic issues raised by the Triangle Site in relation to crime are limited.

**Table 12.36 Summary Table of Likely Effects**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Likely Effect</th>
<th>Likely Effect without Triangle Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job Creation</td>
<td>Major Beneficial</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Displacement</td>
<td>Minor Adverse</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Local Employment</td>
<td>Moderate Beneficial</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Local Income Levels</td>
<td>Moderate Beneficial</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Local Construction Employment</td>
<td>Minor/Moderate Beneficial</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Housing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure Mix</td>
<td>Moderate Beneficial (moving to Minor if Social housing numbers became over dominant in the affordable/low-cost proportion)</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Capacity</td>
<td>Moderate Adverse</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Educational Performance</td>
<td>Moderate Beneficial (rising to Major if the applicants deliver the higher education and other education links facilities proposed in the Implementation Strategy)</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Social Capital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shops and Leisure</td>
<td>Major Beneficial</td>
<td></td>
</tr>
<tr>
<td>Childcare</td>
<td>Negligible/Minor Beneficial (rising to Moderate/Major if facilities were made available to existing local residents)</td>
<td>Would result in loss of proposed crèche but no significant impact if alternative provision made on Main Site.</td>
</tr>
<tr>
<td>Community/Leisure Centres</td>
<td>Moderate Beneficial</td>
<td>Would result in loss of proposed community/leisure facility but no significant impact if alternative provision made on Main Site</td>
</tr>
<tr>
<td>Open Space</td>
<td>Major Beneficial</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Crime &amp; Community Safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perception and Fear</td>
<td>Major Beneficial</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Incidence of Crime</td>
<td>Major Beneficial</td>
<td>No significant difference</td>
</tr>
</tbody>
</table>
12.8 **Opportunities for Further Mitigation Measures**

12.8.1 King’s Cross Central would result in a major improvement in social and economic conditions in the neighbourhoods that surround it and beyond. The significance of negative impacts on the local population are generally low. However, with some additional inputs and joint working between the applicants, the Local Authorities and other partners, King’s Cross Central could achieve dramatic regeneration outcomes, addressing negative effects and enhancing positive. This section reviews possible mitigation and enhancement measures.

**The Regenerative Effect of Starting and Completing the Development**

12.8.2 The former rail lands have been vacant and underused for more than twenty years. To local residents they represent a physical ‘scar’ on the landscape and a barrier to east-west movement between communities. The start of work on site would provide relief for numerous local residents who are fed up with waiting for something to happen. Camden Primary Care Trust have suggested that the raised and dashed hopes of the past failed attempts to develop are likely to have taken a toll on residents levels of stress. Merely beginning work on site would overcome uncertainty. It would also signify the completion of CTRL and the opening of St Pancras International services.

12.8.3 In addition a construction programme that delivers regular new additions to the physical, social and economic fabric of the area in a managed way that limits disturbance and impact on residents lives would give assurances that the development is likely to be completed in a timely fashion and start to change negative perceptions of the area.

**Maximising Benefits of the Development Programme**

12.8.4 The length of King’s Cross Central construction period means that there is the potential for the construction sector to become a long-term stable employment base within the local economy. However, the nature of construction work means that employment generated and skills needed could fluctuate over the development period.

12.8.5 The applicants should consider how to retain people onsite for longer by moving them from one building to another as development progresses. As a result, the numbers of local people that could benefit could be far greater than the ‘full time equivalent’ (FTE) figures quoted in section 12.7.

**Maximising Local Employment**

12.8.6 The analysis has shown that King’s Cross Central would create up to 32,500 new jobs. It has shown that, even without intervention, around 9,750 new jobs are likely to be taken by local people. The effect of King’s Cross Central on local employment and training is likely to be far greater than the jobs and courses on offer on site alone. The scale and diversity of employment and education sectors within the scheme mean that it could act as a focus for much wider programmes aimed at increasing opportunities for local people in employment markets across London.

12.8.7 Labour initiatives can address the demand-side and supply-side of employment. The supply-side relates to the role of employers in recognising the local labour market. The demand-side relates to the workforce, ensuring that individuals have the necessary skills and experience to access local jobs.
Such initiatives have been shown to help increase local employment at different stages of the development process (for example initiatives are in place at Greenwich, Paddington and Stratford). There is evidence (e.g. Building London Creating Futures Partnership and Greenwich Peninsula work) that strategically co-ordinated labour initiatives that are applied to wide geographic areas can deliver significantly more opportunities to local communities than site based or local initiatives alone.

By targeting the factors that give rise to low local employment rates evidence from other initiatives suggests that local employment at King’s Cross Central could be increased to 40% of the total jobs, up to 13,000 jobs (10% in the Central Impact Zone and 30% in the Wider Impact Zone).

Given the scale of the King’s Cross Central project and other projects programmed for construction at the same time (including Stratford City and Arsenal) there would be benefits in joint development of a local employment strategy that maximises local take-up at King’s Cross Central but has links into a much wider geographic area than the development site alone. Activities the Strategy could include are considered further in the Regeneration Strategy.

**Stewardship**

Long term ownership of the land and the principle of 'stewardship' in the applicants’ approach to management mean that they would be well placed to forge close ties with occupiers and encourage them to participate in local employment and training initiatives. The estate management team at King's Cross could itself employ 350 - 400 staff when the development is complete and these jobs would provide a range of opportunities for career progression. Combining these roles with public and voluntary sector led training and brokerage initiatives could dramatically increase local take-up and foster long term co-ordination between employers, public agencies and local communities that hitherto has struggled to develop in major developments elsewhere in the UK.

**Prioritisation of Community Facilities**

King’s Cross Central would offer facilities that provide important elements in developing stronger social capital, across existing community boundaries. The applicants envisage a range of community, leisure and assembly uses and aim to work with the Local Authorities and other service providers to ensure the best use of land and other resources is made, both on and off the site.

Initial analysis suggests that the applicants, Local Authorities and other partners should prioritise sustainable long term solutions for GP/healthcare facilities (dealt with in more detail in the Health Specialist Report), childcare for children under five years and primary and secondary education initiatives. It is recommended that all community facilities proposed are considered within the context of the Public Realm Strategy. These recommendations have been developed further in the Regeneration Strategy.
Need for Joint Working

12.8.14 Camden and Islington Councils’ Planning and Development Brief advises:

“Where a facility is better placed outside the Area (but accessible to it), the Councils, alongside the PCTs and other health care providers in the area, will work with the developer to identify and deliver the best location. In all cases the funding and the partnership work required indicate that new facilities are likely to be provided as co-operative ventures… (2.10.8)

Close partnership working on funding and delivery will be essential. Elements may also share buildings and spaces with other uses, and encourage people to move throughout the whole King’s Cross area… (2.11.5)

In some circumstances, the upgrade of existing nearby facilities in poor condition may be preferable to building new facilities on-site. This can often be more sustainable, a better use of resources and retains facilities that are located within the communities that need and use them. However, the Councils will continue to work with health, social and other services and the local community to prepare options… (2.12.4)” (London Borough of Camden, King’s Cross Opportunity Area Planning and Development Brief, December 2003)

12.8.15 There would be advantages in the applicants with the Councils’, jointly prioritising those facilities that would have a significant effect on building social capital.

Raising the Standard of the Surrounding Area

12.8.16 For maximum regeneration benefit it is important that in the long term King’s Cross Central helps to raise the standard of the environment and streetscape in the neighbourhoods around it as well as within the site. The applicants have a lot of experience in the management of major developments and new urban neighbourhoods.

12.8.17 There would be advantages in the applicants sharing their ideas and experience in design and long term management of the public realm with the Local Authorities, and local communities to encourage optimal integration between King’s Cross Central and the neighbourhoods that surround it. Again this is addressed further in the Regeneration Strategy.

Education Initiatives

12.8.18 The assessment highlighted some potential adverse impacts on existing schools capacities to accommodate more pupils. It also concluded that the proposals would have a beneficial impact on local school performance. This effect could be enhanced by establishing more concrete links between schools and some of the activities on the development.

12.8.19 The following links would be beneficial:

- supporting primary and secondary school education initiatives aimed at increasing local capacity and performance;
- working with the education authorities to assess the need for new facilities for young people;
- encouraging occupiers to develop relationships with local schools and education initiatives;
- exploring the scope of special education initiatives as methods of raising local educational achievement;
- working with the Education Authorities to enhance performance, foster links between business and education and encourage greater interaction between communities and schools serving them;
- developing links and potentially an on-site presence of higher education facilities;
- developing an exploratory centre, within the development; and
- aiming to ensure King’s Cross becomes a Centre of Excellence for every stage of child development.

**Community Safety**

12.8.20 There is an opportunity to explore ways of improving community safety and management of the environment, jointly with the Metropolitan Police and the Local Authorities, to ensure King’s Cross Central and adjacent areas provide a safe and welcoming environment. This means:
- consulting with Police design teams to design out opportunities for crime;
- considering the best location and licence controls for evening uses; and
- promoting active management of the public realm.

**Long-Term Management**

12.8.21 Good environmental management and the quality of streets and buildings can have a significant impact on 'social capital', helping to reduce crime and the fear of crime, and increase environmental responsibility and pride.

12.8.22 A high quality management strategy would ensure the retention of the high quality public realm proposed. The strategy should include ways of managing, public and private areas, including security, cleansing, traffic management, gardening, repairs and information provision. The organisation needed to support such an initiative should aim to employ local people to foster pride and develop knowledge of the development. The Public Realm Strategy and Regeneration Strategy consider this issue further.

12.8.23 Besides opportunities directly generated, the King’s Cross Central management role could also provide a focus for a wide range of other social and economic initiatives aimed at tackling local deprivation and disadvantage, including:
- a focus for educational and training programmes;
- highlighting the range of employment sectors and occupational positions available to people; and
- demonstrating the merits of different housing tenures; and
- encouraging greater take-up of services.

**Affordable Housing**
12.8.24 The housing component of the King’s Cross Central proposals should be a core element in its contribution to the regeneration of the wider area. Whilst there is a need to recognise the need for social housing to address Camden and Islington Councils’ housing waiting lists there is a danger that by prioritising significant quantities of new social housing within the affordable housing quantum King’s cross central may bring further disadvantage and polarisation to new and existing communities and add further pressure to services (a danger raised by the Association of London Government in its response to the EIP for the London Plan).

12.8.25 Instead, King’s Cross Central is large enough to act as a catalyst for the creation of an ‘intermediate’ market in its own right. Prioritising intermediate provision would signify a number of important positive economic and social changes, including:

- the creation of a local ‘ladder’ of housing choice;
- encourage low and middle income workers to move to jobs in Camden and Islington and other Central London locations;
- help stabilise transience in the local population by providing choice in the housing market.

**Early Support**

12.8.26 The timing of interventions is critical to successful regeneration. To date, the Local Authorities and local partnerships have achieved considerable success in improving education performance, increased community safety and reduced crime levels, better health services and more training and job brokerage services. It is important that the momentum gained should not be lost in the intervening period before development begins on King’s Cross Central.

12.8.27 Encouraging and supporting some initiatives early in the development process, within the limited resources available, would deliver and ‘lever in’ significant benefits. These could include:

- supporting employment initiatives that prepare local people for jobs known to be needed on site;
- helping the Education Authorities on childcare and education strategies;
- involvement in local schools;
- working with the Police on design and community safety and the Local Authorities and local communities on area management initiatives;
- it could also mean lending support to bids for further funding and special programmes.

All of these points are discussed further in the Regeneration Strategy.

**12.9 Monitoring**

12.9.1 Monitoring of local socio-economic conditions would usefully inform future decisions about the best form of new community provision within King’s Cross Central.
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UK Research Partnership Ltd on behalf of London Borough of Greenwich, NMEC and English Partnerships, [2003], Economic Impact Study of Millennium Experience and Greenwich Peninsula
Appendix 12.A - Employment Density Ratios

- **Residential** - an employment density of 10,000 square metres per full time equivalent employee has been assumed for the management and maintenance of residential areas of the scheme. This is based on Arup’s past involvement in residential developments.

- **A1, A2 and A3 uses** - an average employment density of 20 square metres net internal per full time equivalent employee has been assumed, given that the nature of these uses varies considerably. English Partnerships’ guidance (2001) indicates that densities between these uses vary between 10 for small shops (less than 50 sq.m), 13 for restaurants (excluding fast-food restaurants) and 20 for town / city centre retail units.

- **Hotels** - employment densities for hotels are generally calculated from the number of rooms. It has been assumed that on average there will be one hotel room per 60 square metres of gross external floorspace. It is proposed that King’s Cross Central will include a maximum hotel floorspace of 47,225 square metres, which equates to a maximum of 428 hotel bedrooms. An employment density of 0.6 full time equivalent employees per bedroom, has been assumed, pursuant to English Partnerships’ guidance (2001).

- **Business (B1)** - the Greater London Authority and English Partnerships have provided guidance on employment densities in offices, both of which indicate that densities within offices vary greatly. English Partnerships’ (2001) report indicates that densities range from 12.8 people per square metre (p/sqm) for call centres, 16 p/sqm in a business park location, 19 p/sqm for general purpose built offices, 20 p/sqm for City of London, and 22 p/sqm for headquarters buildings. These higher figures reflect the space need for reception areas, directors and boardrooms. The Greater London Authority (Greater London Authority, 2003) has updated the figures based on a London assessment, concluding that the most appropriate average to apply is 16 square metres per full time equivalent employee. For this assessment 16 sqm net internal has been applied.

- **Community services (D1 uses)** - this use class varies substantially as it includes uses that operate very differently such as museums, community halls, cultural facilities, health facilities and education facilities. A density of 150 square metres net internal per full time equivalent employee has been applied, as used in the Stratford City Socio-Economic Assessment.

- **Leisure (D2)** - the leisure component of the scheme would comprise a mix of cinemas, other entertainment venues and sports / health uses. A maximum floor area for a cinema has been provided and therefore the employment density indicated by English Partnerships (2001) of 90 square metres net internal per full time equivalent employee has been applied. For the remainder of the leisure floorspace, an employment density of one employee per 60/75 square metres net internal has been assumed, pursuant to English Partnerships’ guidance.

- **Multi storey car park** - an employment density of 10,000 square metres (gross external) per full time equivalent employee has been assumed for the operation of the multi storey car park. This was used in the Stratford City Socio-Economic Assessment.
Appendix 12.B - Employment Tables

King's Cross Central
Employment Estimates

Scenario 1 (Maximum Employment and Retail)

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Main Site</th>
<th>Triangle Site</th>
<th>Total Employment By Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail (A1, A2, A3)</td>
<td>31,000</td>
<td>22,950</td>
<td>20</td>
</tr>
<tr>
<td>Offices</td>
<td>400,000</td>
<td>320,000</td>
<td>16</td>
</tr>
<tr>
<td>Residential</td>
<td>176,750</td>
<td>N/A</td>
<td>10,000</td>
</tr>
<tr>
<td>Community facilities, health, museums (D1)</td>
<td>42,350</td>
<td>33,880</td>
<td>150</td>
</tr>
<tr>
<td>Leisure (D2 excluding cinemas)</td>
<td>13,525</td>
<td>10,820</td>
<td>180</td>
</tr>
<tr>
<td>Cinemas</td>
<td>8,475</td>
<td>6,790</td>
<td>90</td>
</tr>
<tr>
<td>Hotels</td>
<td>15,675</td>
<td>N/A</td>
<td>0.6 per room</td>
</tr>
<tr>
<td>Multi Storey Carpark</td>
<td>23,850</td>
<td>N/A</td>
<td>10,000</td>
</tr>
<tr>
<td>Other</td>
<td>525</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>718,275</td>
<td>401,080</td>
<td>-</td>
</tr>
</tbody>
</table>

Assumptions:
1. Different employment generation patterns would be expected between leisure uses located in maximum employment and maximum housing scenarios.
2. A high employment ratio of one job per 60sqm has been used for Community Uses on the Triangle Site to account for the mix of Community and Leisure uses proposed. The mix would be expected to generate more employment than Community uses alone (one job per 150 sqm).

King's Cross Central
Employment Estimates

Scenario 2 (Maximum Residential)

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Main Site</th>
<th>Triangle Site</th>
<th>Total Employment By Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail (A1, A2, A3)</td>
<td>31,000</td>
<td>22,950</td>
<td>20</td>
</tr>
<tr>
<td>Offices</td>
<td>400,000</td>
<td>320,000</td>
<td>16</td>
</tr>
<tr>
<td>Residential</td>
<td>176,750</td>
<td>N/A</td>
<td>10,000</td>
</tr>
<tr>
<td>Community facilities, health, museums (D1)</td>
<td>42,350</td>
<td>33,880</td>
<td>150</td>
</tr>
<tr>
<td>Leisure (D2 excluding cinemas)</td>
<td>13,525</td>
<td>10,820</td>
<td>180</td>
</tr>
<tr>
<td>Cinemas</td>
<td>8,475</td>
<td>6,790</td>
<td>90</td>
</tr>
<tr>
<td>Hotels</td>
<td>15,675</td>
<td>N/A</td>
<td>0.6 per room</td>
</tr>
<tr>
<td>Multi Storey Carpark</td>
<td>23,850</td>
<td>N/A</td>
<td>10,000</td>
</tr>
<tr>
<td>Other</td>
<td>525</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>718,275</td>
<td>401,080</td>
<td>-</td>
</tr>
</tbody>
</table>
### King's Cross Central Employment Estimates

**Scenario 3 (Maximum Employment and Retail Excluding Triangle Site)**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Gross external (sqm)</th>
<th>Gross Internal (sqm)</th>
<th>Employment Density (sqm/FTE)</th>
<th>Gross Employment (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail</td>
<td>45,285</td>
<td>36,228</td>
<td>25</td>
<td>1,811</td>
</tr>
<tr>
<td>Offices</td>
<td>486,280</td>
<td>389,024</td>
<td>16</td>
<td>24,314</td>
</tr>
<tr>
<td>Residential</td>
<td>125,000</td>
<td>N/A</td>
<td>10,000</td>
<td>13</td>
</tr>
<tr>
<td>Community facilities, health, museums (D1)</td>
<td>22,560</td>
<td>18,048</td>
<td>150</td>
<td>120</td>
</tr>
<tr>
<td>Leisure (D2 excluding cinemas)</td>
<td>10,025</td>
<td>8,020</td>
<td>60</td>
<td>134</td>
</tr>
<tr>
<td>Cinema</td>
<td>4,750</td>
<td>3,800</td>
<td>90</td>
<td>42</td>
</tr>
<tr>
<td>Hotels</td>
<td>0</td>
<td>N/A</td>
<td>0.6 per room</td>
<td>0</td>
</tr>
<tr>
<td>Multi Storey Carpark</td>
<td>23,850</td>
<td>N/A</td>
<td>10,000</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>525</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>718,275</td>
<td>455,120</td>
<td>-</td>
<td>26,436</td>
</tr>
</tbody>
</table>

**Assumptions:**

3. The exclusion of the Triangle Site will mean leisure uses on the main site need to be designed to cater for office and residential users. Therefore a leisure ratio of one job per 60sqm is considered appropriate as the ‘worst case’.

### King's Cross Central Employment Estimates

**Scenario 2 (Maximum Residential)**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Gross external (sqm)</th>
<th>Gross Internal (sqm)</th>
<th>Employment Density (sqm/FTE)</th>
<th>Gross Employment (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail (A1, A2, A3)</td>
<td>37,000</td>
<td>29,600</td>
<td>20</td>
<td>1,480</td>
</tr>
<tr>
<td>Offices</td>
<td>450,000</td>
<td>320,000</td>
<td>16</td>
<td>20,000</td>
</tr>
<tr>
<td>Residential</td>
<td>176,875</td>
<td>N/A</td>
<td>10,000</td>
<td>18</td>
</tr>
<tr>
<td>Community facilities, health, museums (D1)</td>
<td>42,350</td>
<td>33,880</td>
<td>150</td>
<td>226</td>
</tr>
<tr>
<td>Leisure (D2 excluding cinemas)</td>
<td>13,525</td>
<td>10,820</td>
<td>60</td>
<td>180</td>
</tr>
<tr>
<td>Cinema</td>
<td>8,475</td>
<td>6,780</td>
<td>90</td>
<td>75</td>
</tr>
<tr>
<td>Hotels</td>
<td>15,675</td>
<td>N/A</td>
<td>0.6 per room</td>
<td>157</td>
</tr>
<tr>
<td>Multi Storey Carpark</td>
<td>23,850</td>
<td>N/A</td>
<td>10,000</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>525</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>718,275</td>
<td>401,080</td>
<td>-</td>
<td>22,138</td>
</tr>
</tbody>
</table>
**Deadweight**: is an output that would have occurred without the proposed development.

**Displacement**: is the proportion of the outputs from the proposed development that would be taken from other businesses or organisations in the area.

**Multiplier effects**: are economic activities (jobs, expenditure or income) that would result from knock-on indirect effects of the proposed development.
Unemployment Benefit Claimants, 1999 - 2003

Figure 12.2
Proportion of Economically Active 16 – 74s
Claiming Unemployment Benefit

Figure 12.3
Looking after home/family
Lone parent in part-time employment (male)
Lone parent in part-time employment (female)
Lone parent in full-time employment (male)
Lone parent in full-time employment (female)

Percentage of Dependence in the Central and Wider Impact Zones

Figure 12.4
Percentage of Unpaid Care in the Central and Wider Impact Zones

Figure 12.5
Notifiable Offences Recorded by Police 2000 / 2001

Figure 12.6

Source: Home Office cited in ONS Neighbourhood Statistics
King’s Cross Central

Environmental Statement

Volume 3: Part 13 Health Specialist Report

Prepared for Argent St George, London and Continental Railways and Exel by Arup

May 2004
Part 13 – Health Specialist Report

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13.22 Assessment of Health Services Effects on Health

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13A Determinant/Health Linkages Matrix
13B Health Services Inventory
13C Traffic Accident Data
13 Health Specialist Report

13.1 Introduction

13.1.1 This specialist report has been prepared by Arup, on behalf of Argent St George. It considers inner urban health impacts with the established practices of Environmental Impact Assessment (EIA). Methodological considerations and comparative models are discussed below.

Health within EIA

13.1.2 To date, few development projects set in such a complex urban environment as King's Cross have addressed health at the planning/EIA stage. Methodological comparisons can be made, however, between this study and selected assessments completed for proposed developments elsewhere in the UK, although all were undertaken following the submission of the application. The appropriate inclusion of an element of health consideration at this stage of the development/application process allows the integration of health issues with other environmental, social and physical impacts. It facilitates the consideration of measures to mitigate impacts on the health of communities occupying the scheme and in surrounding neighbourhoods. It also helps to identify potential health gain opportunities.

Definition and determinants of health

13.1.3 The determinants of health are multi-faceted. They are often closely linked with the particular social or economic circumstances of individuals or communities, but may also be derived from a specific susceptibility to disease or risk of injury. In considering health impacts arising from development or policy, many literature resources advocate a wider, social understanding of health issues, including Health Canada (1999), Cave and Curtis (2001a), Cave and Curtis (2001b), Ison (2000a) and Barnes and Scott-Samuel (2000). The World Health Organisation’s broad definition of ‘health’ has been used for this assessment:

“Health is a state of complete physical, mental and social well-being and not merely an absence of disease” (WHO, cited in Barnes and Scott-Samuel, 2000).

13.1.4 The inclusion of social influences in this definition has led to the identification of a broad range of health determinants – a range of environmental, social, economic and fixed factors that influence health and well-being. In particular, Dahlgren and Whitehead (1991, cited in Greater London Authority, 2002) suggest that there are five main determinants of health:

- age, sex and constitutional factors;
- individual lifestyle factors;
- social and community networks;
- living and working conditions; and
- general socio-economic, cultural and environmental conditions.
13.1.5 Social determinants of health are particularly relevant to major development projects, especially those with a regeneration focus, as different stages of construction and operation have the potential to influence a wide range of determinants of health, positively and negatively. Many of these fall outside the influence of developers or health care providers, but can be mitigated or promoted by consideration of the form of development and the provision/response of other public and private services.

13.1.6 The quality and quantity of health care and other health related services form an important component of any assessment (Scott-Samuel et al., 2001). The scale and quality of services can often be as important as other socio-economic or epidemiological determinants in assessing the risk of poor health in wider communities.

**Overall scope of the report**

13.1.7 This report has been prepared as one part of the Kings Cross Central Environmental Statement to support and facilitate planning consideration of the submitted proposals. It is not a stand-alone Health Impact Assessment (HIA) of (wider) changes in King’s Cross.

13.1.8 However, an independent HIA is being conducted by the King’s Cross HIA Management Team, made up of Camden Primary Care Trust (PCT) as the lead agency, supported by Islington PCT, the London Borough of Camden, the London Borough of Islington, and the King’s Cross Partnership. This HIA has a much wider scope than the King’s Cross Central development – covering Channel Tunnel Rail Link (CTRL), King’s Cross Station Enhancement, London Underground Ltd (LUL) extension, Thameslink Station re-location, P&O Regents Quarter development and the King’s Cross Opportunity Area developments. Other developments may be included as they arise. Funding is currently available for a preliminary or preparative phase of information gathering to inform the scope and the appraisal, and implementation of a rapid appraisal technique (Ison, 2003b).

13.1.9 Further details regarding the spatial, temporal and assessment scope of this study are provided in the following section (Section 13.2). The structure of health service organisations within the UK has undergone change in recent years and therefore the organisations referred to in historic data within this report may not still exist. Currently, health services within the Central and Wider Impact Zones for this assessment are run under two Primary Care Trusts (PCTs) – Camden PCT and Islington PCT. These groups were formerly amalgamated under one Primary Care Group (Camden and Islington Primary Care Group).

**Supporting Information**

13.1.10 A full list of external documents referred to in this report is provided in Section 13.10. Furthermore, the following documents included within the application material have also been referenced:

- Socio-economic Specialist Report, prepared by Arup and included within Part 12 of the Environmental Statement;
- Noise and Vibration Specialist Report, prepared by The English Cogger Partnership and included within Part 17 of the Environmental Statement;
- Air Quality and Climate Change Specialist Report, prepared by Air Quality Consultants Ltd and included within Part 18 of the Environmental Statement;
- Transport section (Part 5.3) of the Environmental Statement, prepared by Arup;
13.2 Methodology and Assessment Criteria

Introduction

13.2.1 As described in the previous chapter, there are few directly comparable assessments within the UK. However, the methodology used is consistent with assessments undertaken for development projects within the UK that have used Environmental Impact Assessment as a principal information source regarding the effects of the development (e.g. Dibden Bay, Finningley Airport).

Scope of assessment

Determinants of Health

13.2.2 The Socio-economic Report (Part 12) has highlighted social and economic conditions for communities in the Central and Wider Impact Zones. To understand the factors contributing to poor health in King’s Cross it is important to look at the underlying causes of deprivation. The annual Health in London Report (Greater London Authority, 2002) highlights ten indicators from which health inequalities can be monitored, these are (i) unemployment; (ii) ethnicity and unemployment; (iii) educational attainment; (iv) proportion of homes judged unfit to live in; (v) domestic burglary rate; (vi) air quality; (vii) road traffic accidents; (viii) life expectancy at birth; (ix) infant mortality rate; (x) proportion of people with self-assessed good health.

13.2.3 The correlation between these factors and the causes of deprivation in King’s Cross makes these indicators a good basis for this assessment. Of the indicators listed above, the first seven are determinants of health, whilst the latter three are health focused statistics which can be influenced by a wide variety of factors. In comparable assessments health focused statistical indicators such as life expectancy, mortality rates and prevalence of disease are used primarily to provide a snapshot of current conditions, rather than an assessment of the likely effects of a particular development. Other health statistics have also been provided in this report to further enhance the baseline assessment and fully understand the health issues within the locality.

13.2.4 Furthermore, following consultation responses to the scope of this study and literature review, the additional determinants of social capital and noise have been added. Unfortunately, there are few indicators available to assess social capital in the same way as the other determinants and so qualitative conclusions have been drawn.

13.2.5 Thus, the full scope of determinant indicators included in this assessment is as follows: (i) unemployment; (ii) ethnicity and unemployment; (iii) educational attainment; (iv) proportion of homes judged unfit to live in; (v) domestic burglary rate (crime); (vi) air quality indicators; (vii) road traffic accidents; (viii) social capital; and, (ix) noise.

13.2.6 These indicators form the basis of the consideration of likely effects on the determinants of health as a result of the development. Where relevant to local conditions and where information is available, a wider consideration of related issues is made under the indicator headings.

13.2.7 To aid navigation through this report, the determinants of health have been further subdivided into those that are predominantly socio-economic factors, and those that are more related to the physical environment, as follows:
### Socio-economic factors
- Unemployment
- Ethnicity and unemployment
- Educational attainment
- Proportion of homes judged unfit to live in
- Domestic burglary rate (crime)
- Social capital

### Physical environment factors
- Air quality
- Road traffic accidents
- Noise

### Health Services

**13.2.8** DoE Guidance (1995) suggests that the main impacts on people arising from development will be on the capacity of services to cope with extra population. This includes demand for hospitals and other health services. In King’s Cross Central differing demands for health services would arise from the working and residential population introduced to the area.

**13.2.9** A review of existing local health services has been undertaken to gain an understanding of current provision and capacity, with a view to assessing the effects the development may have on these services. The range of services reviewed included: general medical practitioners, dental practices, opticians and pharmacies. Assessment of the full range of services and service needs is limited by information availability.

### Other Issues Raised

**13.2.10** During the course of the assessment a number of issues have been raised in relation to health effects that are either dealt with elsewhere in the Environmental Statement and/or have been ‘scoped out’ because significant environmental/health effects are not likely. These are as follows:

- **Contaminated land:** Issues relating to contaminated land, including risk assessments and the potential for effects on construction workers are considered in the ‘Soils and Contamination Specialist Report’ in Part 16 and summarised in Chapter 5.8 of the Environmental Statement.

- **Accidents on site during construction:** The safety of construction workers would be dealt with in Contractors Health and Safety Plans, which would set out how all health and safety risks are identified and managed in accordance with current best practice and legal requirements. Contractors would also be responsible for ensuring the safety of the general public and any visitors to the site. (Road traffic accidents outside the construction site during this phase are considered, under ‘Determinants of Health (physical environment factors’)).

- **Potential disturbance of vermin as a result of construction:** The following measures would be adopted:
  - Removal or stopping and sealing of drains and sewers brought into disuse
  - Prompt treatment of any pest infestation and arrangements for effective preventative pest control
Part 13 – Health Specialist Report

- Appropriate storage and regular collection of putrescible waste
- Any instances of pest infestation on the construction sites would be notified to the relevant local authority as soon as practicable.

- **Light pollution during construction:** lighting of the site boundary and associated areas would be designed and installed to ensure that it does not intrude unnecessarily on adjacent buildings and land uses, cause distraction or confusion to passing drivers, constitute a road hazard and would be chosen to minimise light pollution effects and discourage crime/anti-social behaviour.

- **Light pollution during operation:** The potential for light pollution to affect health is primarily through annoyance and sleep disturbance associated with residential development conflicting with more ‘24-hour’, largely leisure related, development with significant lighting requirements. This issue is dealt with under Cultural Heritage and Townscape in Section 5.1 and Part 9 of the Environmental Statement. It is also a detailed design matter that can be addressed through the normal process of planning approval for each phase of the development, later.

**Population affected/Spatial scope**

13.2.11 The extent to which development affects the determinants of health would be largely dependent on whether people are users of the new facilities or members of existing communities who may be affected indirectly. Users of the new facilities include new residents, workers and visitors. Their health would be directly influenced by such issues as the:

- quality of the development;
- the environmental conditions it creates;
- the standard of homes and offices;
- the range and quality of jobs;
- the quantity and mix of social and community facilities; and
- the quality of public services supporting the development.

13.2.12 Members of the existing community may also be users of the facilities. The development offers the opportunity for local people to obtain new jobs, new homes and take advantage of new services and facilities. The extent to which the development affects the health of all these people is linked to the extent of its influence over their current living conditions and environment. For example, those that benefit from better jobs may increase their income and change their social and economic circumstances. Others may only take advantage of new shops or community facilities affecting only certain aspects of their socio-economic circumstances directly.
13.2.13 For many existing communities the development is more likely to affect their health indirectly. For example:

- the influx of a new population (residents, workers and visitors) may place increased pressure on existing health services that the community rely on, limiting access;
- the development is likely to encourage greater investment in land and property, outside the development boundary, potentially facilitating improvements in the quality of housing, wider public realm and community facilities.
- investment in the area by employers, contractors and other service providers may result in increased opportunities for funding training, child care and transport services, all of which increase local access to employment and income.

13.2.14 It is difficult to establish the geographic extent of the expected health impacts. However, the inextricable linkages between health and socio-economic conditions suggest that the appropriate geographic area of impact assumed for this study should be the same as that for the socio-economic study. Ward boundaries changed in May 2002; thus, the wards contained within the Central & Wider Impact Zones have also changed. The date of origin of the data in this chapter will determine whether old or new wards are referred to. The geographical extent of the study based on new and old wards is shown below.

<table>
<thead>
<tr>
<th>OLD WARD BOUNDARIES</th>
<th>NEW WARD BOUNDARIES (MAY 2002)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central Impact Zone</strong></td>
<td><strong>Central Impact Zone</strong></td>
</tr>
<tr>
<td>Brunswick</td>
<td>Caledonian</td>
</tr>
<tr>
<td>Camden</td>
<td>Kings Cross</td>
</tr>
<tr>
<td>Holloway</td>
<td>St. Pancras &amp; Somers Town</td>
</tr>
<tr>
<td>Kings Cross</td>
<td></td>
</tr>
<tr>
<td>Somers Town</td>
<td></td>
</tr>
<tr>
<td>Thornhill</td>
<td></td>
</tr>
<tr>
<td><strong>Wider Impact Zone</strong></td>
<td><strong>Wider Impact Zone</strong></td>
</tr>
<tr>
<td>Barnsbury</td>
<td>Barnsbury</td>
</tr>
<tr>
<td>Bloomsbury</td>
<td>Bloomsbury</td>
</tr>
<tr>
<td>Clerkenwell</td>
<td>Clerkenwell</td>
</tr>
<tr>
<td>Holborn</td>
<td>Cantelowes</td>
</tr>
<tr>
<td>Regents Park</td>
<td>Holborn &amp; Covent Garden</td>
</tr>
<tr>
<td>St. Pancras</td>
<td>Holloway</td>
</tr>
<tr>
<td></td>
<td>Regents Park</td>
</tr>
</tbody>
</table>
Temporal Scope

13.2.15 The baseline date for the impact assessment is 2006/7. Using projections made in the Socio-economic and other Environmental Assessment Reports, it has been possible to estimate changes in local conditions by 2006/7. Where evidence exists the assessment then attempts to link these changes to the health specific indicators discussed earlier. The result is a largely qualitative view of the likely health of local communities in 2006/7. The assessment also takes account of known changes in health service provision between 2003 and 2006/7.

Approach

13.2.16 This report combines a number of methods to identify and assess potential effects on the health of existing and future communities within the Kings Cross area as a result of the development, within the scope described above.

- Socio-economic and other Environmental Assessment Reports. As acknowledged in the previous chapter, a wide range of social, environmental and economic factors (determinants) affect the health and well being of individuals and communities. Within this Environmental Impact Assessment many of these factors have been assessed in great detail. Thus, the findings of these assessments are relevant to the assessment of health, and have been summarised and used for baseline and impact assessment.

- Literature review. A search has been made of the available literature (including previous health studies and recent research) to provide an evidence base linking changes to the social, environmental and economic determinants with potential effects on health. Effects may be direct or indirect and links may be causal or compounding. The literature review is included within this specialist report, towards the end of this section (titled ‘Determinant/Health Linkages’), a full reference list is provided at the end of the report and Appendix 13A provides a Matrix of Health determinants and linkages derived from the literature review.

- Services search and survey. The existing range of health services within the Central Impact Zone has been assessed through a website search (www.nhs.uk) and telephone survey to determine available capacity. Information was gained on:
  (i) Location
  (ii) Services offered (including personnel, medical services and language services)
  (iii) Capacity for new patients (NHS/non-NHS patients)

- Consultation. Consultation with members and representatives of the PCT has been ongoing throughout the preparation of this report to allow for information transfer and co-operation between all parties. Advice has been sought, in particular, on:
  (i) Health services provision and capacity
  (ii) Trends in general health and health services
  (iii) Determinant/health linkages
Assessment and Significance of Effects and Significance

Assessment of effects

13.2.17 The assessment of health impacts distinguishes between direct and indirect impacts and considers negative as well as positive effects. It is important that a distinction is made between impacts on people’s health generated directly or indirectly by the development and continuing poor health of existing communities that are amongst the most deprived in the UK. In general, the higher the deprivation levels a community is experiencing the poorer health its members are likely to have and the greater the demand for health services that would be experienced.

13.2.18 The report systematically describes the expected effects of the development on the determinants and services described in the baseline (Section 13.5), within the scope described earlier in this section.

13.2.19 In general, the health-based statistics (e.g. life expectancy at birth, infant mortality rate and proportion of people with self-assessed good health) have not been assessed directly as they have a wide and complex range of contributory factors, many of which are not related to the development. In any event, it is expected that any changes that may arise in these indicators (positive or negative) would result from changes in other determinants of health. This approach is consistent with other assessments for development projects.

13.2.20 Given the multiple influences on determinants of peoples’ health, it is difficult to distinguish between effects that may result from the development and those that may occur due to other personal, environmental, social or economic influences. Therefore a quantitative assessment has not been attempted. Instead, a qualitative assessment is made, focusing on the potential range of effects to allow an identification of mitigation measures to address any potential negative effects, and other measures that would promote potential health gain.

13.2.21 The assessment of effects is based on: (i) other assessment reports contained within the Environmental Statement; (ii) comparison with other assessments of health; (iii) results of consultation initiatives and (iv) consultants’ judgement.

Assessment of Significance

13.2.22 The assessment of significance of potential health effects is an area of uncertainty. Given the context of this study and the complex urban environment in which it is situated, it is not possible to accurately predict the magnitude of all potential effects on health resulting from the development. Given this limitation, significance is estimated in the following way:

1) Identification of the significance of effects on individual determinants, taken from specialist reports/summary assessment chapters. This assessment will thus be subject to the same assumptions/limitations described in the relevant specialist reports that make up the Environmental Impact Assessment. Where an appropriate assessment of significance is not available in these reports (e.g. health services, or where the emphasis of the determinant chapter is focused away from the issues of most relevance to health), an estimation of significance is made based on the likely population size affected. This approach is analogous with that undertaken for the Socio-economic Report (Part 12). Examples of differing levels of significance are provided in Table 13.1 below.
Table 13.1: Examples of Significance

<table>
<thead>
<tr>
<th>Population Affected</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects experienced by sub-sections of the local community, e.g. those who undertake a particular activity/use a particular service.</td>
<td>Minor (adverse or beneficial)</td>
</tr>
<tr>
<td>Effects likely across the local community, e.g. within the Central Impact Zone.</td>
<td>Moderate (adverse or beneficial)</td>
</tr>
<tr>
<td>Effects likely to be experienced beyond the site and its immediate locality, into the Wider Impact Zone and potentially beyond.</td>
<td>Major (adverse or beneficial)</td>
</tr>
</tbody>
</table>

2) Where likely significant effects have been identified, further clarification of the potential effects on health have been provided based on the method described in the ‘Merseyside Guidelines for Health Impact Assessment’ (Scott-Samuel et al., 2001) described below.

The Merseyside Guidelines

13.2.23 The Merseyside Guidelines were first published in 1998 as one of the first HIA initiatives in the UK and have become widely known and used (SAHSU, 2000; Barnes and Scott-Samuel, 2000). Examples of their use include, *inter alia*:

- Alconbury Health Impact Assessment (Cambridgeshire Health Authority, 2000)
- Health Impact Assessment, Finningley Airport (Doncaster Health Authority and Doncaster Metropolitan Borough Council, 2000)
- Health Impact Assessment – proposed extension to the Port of Southampton at Dibden Bay (Southampton and South West Hampshire Health Authority, 2001)
- A prospective Health Impact Assessment of the proposed development of a 2nd runway at Manchester International Airport – proof of evidence submitted to the public inquiry (cited in SAHSU, 2000)
- Health Impact Assessment of the Community Safety Projects Huyton SRB Area (cited in SAHSU, 2000)
- Health Impact Assessment on the Ferrier Estate...work in progress (Barnes and MacArthur, in Ison, 2000b)
- Health Impact Assessment of Grove Vale (Harding, in Ison, 2000b)
- HIA of Houldsworth Mill redevelopment, Stockport (Cotterill and Lock, in Ison, 2000b)
- Health Impact Assessment of the Merseyside local transport plan...work in progress (Adhern, in Ison, 2000b)
Their wide use in the UK is further emphasised by SAHSU (2000), stating that:

“most health authorities are currently using the Merseyside Guidelines, which are adapted to meet local needs and projects”.

Many of the projects listed above have also used the flexibility available within the Guidelines to tailor the approach appropriate to the project (SAHSU, 2000; Barnes and Scott-Samuel, 2000).

The Merseyside Guidelines methodology involves the classification of effects in three different ways: (i) determining the nature of the impact; (ii) assessing its measurability; and (iii) estimating the degree of certainty (risk) of the impact. These principles have been used to identify assessment terminology appropriate to an Environmental Impact Assessment and its focus on likely significant effects. Therefore, effects are classified as follows:

- determining the nature of the impact: predicted effects are classified as either positive or negative;
- assessing measurability: as in the Merseyside Guidelines measurability is defined on a 3-point scale of qualitative, estimable or calculable; these terms are self-explanatory;
- estimating the degree of certainty (risk) of the impact: again a 3-point scale is used following the principles of the Merseyside Guidelines. A scale of likelihood is used (based on the fact that unlikely effects are screened out in Stage 1 of the assessment, see above), with effects termed likely, highly likely and definite. The terms are defined further below:

As a guide, ‘likely’ effects generally occur where linkages between the determinant and health effects have been established but where a reasonable level of action is required (e.g. on the part of individuals) to take up the opportunities available; this term is generally more applicable to socio-economic effects (although not exclusively).

‘Highly likely’ effects are those where linkages between the determinant and health have been established and where the effects assessed do not require individuals (or organisations) to take a particular course of action, for example to pursue new opportunities; this term is generally more applicable to physical environment effects (although not exclusively) and/or effects at a community level.

‘Definite’ effects are inevitable

The guidelines stress that definite, quantifiable data are not necessarily superior to qualitative data.

**Determinant/Health Linkages**

This section provides a summary of the findings of the literature review identifying linkages between the selected high-level determinants of health and health effects. Further detail is provided in the Determinant/Health Linkages Matrix in Appendix 13A.
Determinants of Health (Socio-economic factors)

Unemployment

13.2.28 ‘Unemployment is a significant risk factor for health. It is associated with ill health, injuries, poisoning, premature mortality and coronary heart disease. It is also related to depression, anxiety, self-harm and suicide’ (Greater London Authority, 2002). These factors are echoed in various studies reported in Cave et al. (2001), and in Camden and Islington Health Authority (2000), British Medical Association (1999), Southampton & South West Hampshire Health Authority (2001), Hansell and Aylin (2000) and Bardsley et al. (2001), along with linkages to premature mortality, cancers, accidents and bronchitis. Linkages to other determinants, namely, income and education, are reported in Greater London Authority (2002) and Cave et al. (2001) as well as effects on social/economic opportunities (Southampton & South West Hampshire Health Authority, 2001). Furthermore, Acheson et al. (reported in Cave et al., 2001) cite the compound effect of people in poor health.

13.2.29 Additional effects can arise due to poor quality employment, including mental health effects as well as increased risk of coronary heart disease (Cave et al, 2001; Secretary of State for Health, 1999; Southampton & South West Hampshire Health Authority, 2001), as well as similar physical and mental health effects arising from the threat of unemployment (Cave et al., 2001; Hansell & Aylin, 2000). Halvorsen (1998) echoed this view and stated that “what mattered was that re-employment represented a secure job”.

13.2.30 Compounding effects arising from long term unemployment (defined in Census 2001 data as 2 years or more) are reported in Greater London Authority (2002). Particular effects on psychological health (Greater London Authority, 2002; Cave et al, 2001), cardiovascular mortality (Cave et al, 2001), morbidity (Cave et al, 2001) and overall mortality risk (Cave et al, 2001) are described in the literature.

13.2.31 Cave et al (2001) and Southampton & South West Hampshire Health Authority (2001) note that some negative impacts of employment, including musculoskeletal problems, accidents and stress/anxiety, have not been portrayed in literature relative to the effects of unemployment.

Ethnicity and unemployment

13.2.32 The direct and indirect effects of unemployment on health are described in the section above. However, high unemployment levels are reported to be of particular concern for Black and Ethnic Minority Groups and, as reported by Modood (1997, cited in Greater London Authority, 2002), where discrimination is believed to be a factor, psychological effects can be compounded.

13.2.33 The Greater London Authority (2002) included this indicator to highlight the issue of disproportionately high unemployment in some Black and Ethnic Minority Groups. However, the inequalities and associated health issues extend beyond unemployment, as discussed below, acting to potentially further compound negative health effects.

13.2.34 The aspects of ethnicity which are considered by Bardsley and Lowdell (1999) to be relevant to health include ‘race, skin colour, language, religion, cultural group, and country of origin or birthplace’. Bardsley and Lowdell (1999) further identify four areas where inequality between ethnic groups may be a factor:
Determinants of health - for example, Greater London Authority (2002) states that 'non-white groups fare worse on all indicators for which data are available – unemployment, education, burglary, unfit housing and road casualties’. Bardsley and Lowdell (1999) and Wanless (2003) concur, citing a tendency for lower average incomes, higher unemployment and higher levels of poverty among Minority Ethnic Groups.

Prevalence of disease or of behaviour and lifestyle that have differential health risks – for example, the prevalence of the following conditions is understood to vary by Black and Ethnic Minority Group: diabetes, tuberculosis, coronary heart disease, stroke, thalassaemia, sickle cell and different types of cancer (Bardsley and Lowdell, 1999). Important differences in lifestyle/behaviour that have potential health effects are smoking patterns, alcohol use, use of paan (betel nut) and dietary factors (Bardsley and Lowdell, 1999).

Access to and uptake of services which are of potential benefit – for example, Hussey and Johnstone (publication date unknown) identify the potential for the compounding of negative health effects where English is not the first language and no access to an independent translator is available; this is supported by Bardsley and Lowdell (1999) and Banard (2003). Furthermore, cultural differences in the perception of ill-health and lack of knowledge about the availability and range of health services (Bardsley and Lowdell, 1999), as well as concerns over knock-on effects on other benefit/immigration issues (Banard, 2003), are seen as factors.

Measures of health outcome or health status such as differences in mortality – for example, those born in East Africa and South Asia have slightly higher mortality (men aged 20-69), whereas those born in the Caribbean have lower mortality (Wanless, 2003).

**Educational attainment**

Poor education is considered to have a direct effect on health-related behaviour, with the more negative behaviour associated with poorer educational attainment (Greater London Authority, 2002; British Medical Association, 1999). There are correlations with income, employment status and overall socio-economic status (British Medical Association, 1999; Bardsley et al (2001)). Bardsley et al (2001) also correlates poor educational attainment with poor psycho-social health.

**Proportion of homes judged unfit to live in**

A wide range of health effects associated with poor quality housing (including cold, damp, mould and infestation) are cited in Ambrose et al and Best, both reported in Cave et al. (2001), British Medical Association (1999), Barnes and MacArthur (2000), McCarthy (1999), Secretary of State for Health (1999), Hansell & Aylin (2000) and Bardsley et al. (1998). These include respiratory problems (e.g. asthma, rhinitis, alveolitis), cardiovascular problems, gastrointestinal problems (from upsets to stomach cancers), accidents, mental health problems (emotional strain) and excess winter deaths. The health of children in such conditions is particularly highlighted, with negative effects on physical, social and emotional development and mortality reported. As well as the effects stated above, a susceptibility to other illnesses is associated with poor housing conditions. These factors are echoed in the Greater London Authority, (2002) report.
Furthermore, overcrowding is linked to higher rates of mental illness especially in women (Cave et al. 2001) as well as prevalence of infectious disease (e.g. tuberculosis), (Bardsley et al. 1998), and high-rise accommodation is associated with higher prevalence of serious accidents (Cave et al. 2001). Other housing design related effects include accidents such as fires and falls, and mental health/development problems (Greater London Authority, 2002; Cave et al., 2001; Bardsley et al., 1998; Roberts & Power, 1996; Wanless, 2003), with effects from indoor air quality in particular including carbon monoxide poisoning, cancer, respiratory disease, nitrogen dioxide poisoning and asthma (Greater London Authority, 2002; Bardsley et al., 1998).

The British Medical Association (2003) notes that the link between housing and health has been established since the 1800’s, yet it is still an issue today.

**Crime**

Increased mortality along with mental health effects is reported to arise directly from incidents of crime/fear of crime (Greater London Authority, 2002; British Medical Association, 1999; Bardsley et al. 1998). Furthermore, crime is considered to be an indicator of the general well-being of a community and the same factors that affect local crime rates seem to affect health (Greater London Authority, 2002). Furthermore, Bardsley et al. (1998) reports that ‘surveys of the factors that people rate as important to their quality of life invariably identify crime as the most important concern’.

**Social Capital**

Putnam (1993, cited in Cave et al., 2001) described social capital as comprising trust, reciprocity, local identity, civic engagement and community cohesion. Cave et al. (2001) includes a review of recent work on the subject of social capital and health, which reveals divided views on whether a tangible association exists. Those that identify a linkage quote inversely proportional relationships between social capital and mortality, self-assessed fair/poor health, cardiovascular disease, accidents and suicides, as well as proportional relationships between social capital and good mental health and long life expectancy. Some authors cited in the review state these linkages arise as a result of influences on health related behaviour, esteem and health service use, due to social capital/interactions. Linkages to other determinants of health such as income inequality, educational attainment and violent crime are also made.

The link between social capital and health is also made in Health Canada (1999) and Camden Borough Council (2002) – the latter referencing the identification of strong social support being an ‘indicator and protective influence against the harmful effects on physical and mental well-being’ in the Camden and Islington Health Survey. Furthermore, Wanless (2003) states that ‘the social support networks, relationships, and levels of participation and trust in a community are important influences on the health of individuals in that community and on local capacity to address health problems’.

In the context of this study, the availability of leisure, open space and pedestrian facilities/opportunities are considered. These physical features have indirect effects on health through the promotion of exercise opportunities. Strong evidence of links between exercise and health is extensive and well known; for example, in Cave et al. (2001) it is stated that ‘exercise has capacity to diminish morbidity and mortality within the population’ and Wanless (2003) quotes a 20% to 30% reduced mortality risk for physically active adults compared to inactive. More specifically, physical health effects associated with increased exercise include, inter alia, decrease in incidence of myocardial infarction, ischaemic/atheromatous heart disease, increasing general cardiovascular fitness,
prevention of hypertension and osteoporosis, and decreasing obesity (Cave et al., 2001; Soderlund et al., 1996). Furthermore, Soderlund et al. (1996) identify the importance of exercise as part of a daily routine, for example, getting to work. Positive mental health effects associated with exercise are also reported in Cave et al. (2001) with anxiety symptoms and panic disorder improving with regular exercise; Soderlund et al. (1996) associates exercise with feelings of self-worth.

Determinants of Health (Physical environment factors)

Air quality indicators

13.2.42 As reported in McCarthy (1999), ‘a Department of Health Committee has suggested that current urban air pollution nationally causes 12,000 to 24,000 premature deaths annually and a similar number of hospital admissions for respiratory diseases’. The frail, elderly and very young are considered to be the most at risk from the damaging effects arising from the presence of air pollutants (Greater London Authority, 2002; Cambridgeshire Health Authority, 2000; Southampton & South West Hampshire Health Authority, 2001). Particular health effects are related to the respiratory (Greater London Authority, 2002; Cambridge Health Authority, 2000; Cave et al., 2001; McCarthy, 1999; Southampton & South West Hampshire Health Authority, 2001), cardiovascular (Greater London Authority, 2002; McCarthy, 1999) and blood/lymphoid systems (McCarty, 1999).

13.2.43 However, McCarthy (1999) also notes that, proportionally, most respiratory disease is due to self-induced lung damage from smoking. Potential linkages between traffic emissions and asthma have received much press attention, however, both McCarthy (1999) and Soderlund et al. (1996) consider it more likely that emissions cause an aggravation of symptoms rather than induce the condition overall; Soderlund et al. (1996) stresses the importance of this with regard to morbidity, mortality, and cost to the NHS. Southampton & South West Hampshire Health Authority (2001) consider the same to be true of most pollution episode effects, where a pre-existing condition is aggravated rather than a new one induced. On balance, the literature studied indicates that particulate matter cause the greatest concern for human health.

Road traffic accidents

13.2.44 Road traffic accidents are a major cause of death (Soderlund et al., 1996). Rates of road traffic accidents and degree of injury are linked to traffic volume, speed and parking arrangements (Cave et al., 2001; Cambridgeshire Health Authority, 2000; Soderlund et al., 1996; Wanless, 2003). Furthermore, evidence suggests that children from lower social classes are disproportionately involved in road casualties, and that this inequality is increasing (Greater London Authority, 2002; Hansell & Aylin, 2002; Roberts & Power, 1996). Roberts & Power (1996) attribute this to low-income families being unable to afford appropriate in-car child restraints and/or driving cars which may be vulnerable in an accident (smaller/older etc.). Soderlund et al. (1996) quotes evidence of links between all pedestrian accidents rates and deprivation.

13.2.45 Aside from the obvious negative physical effects (trauma and injury) following a road traffic accident, knock-on effects may include psychiatric problems associated with emotional trauma or bereavement, financial/physical dependence on others, and negative effects of a fear of accidents, with effects felt by the individuals involved and their families (Soderlund et al. 1999). A study cited in World Health Organisation/World Bank (2004) reported significant declines in quality of life for 90% of families of people dying from road traffic crashes and 85% of families of road traffic survivors. Children and the elderly are the most vulnerable with regard to accidents (and fear of) (Soderlund et al., 1996;
13.2.46 Other health impacts associated with traffic are:

- **air quality** – physical effects due to the potential for increased concentration of pollutants such as nitrogen dioxide and particulates; discussed under ‘air quality indicators’ (in Determinants of Health, physical environment factors).

- **noise** – physical effects on hearing at high levels of noise, plus annoyance at lower levels; discussed under ‘noise’ (in Determinants of Health, Physical environment factors).

- **exercise** – indirect effect through the promotion/prevention of exercise opportunities; discussed under 'social capital' (in Determinants of Health, Socio-economic factors).

**Noise**

13.2.47 The World Health Organisation in its Guidelines for Community Noise (1999) refers to a definition of adverse effects of noise which encompasses any ‘temporary or long-term lowering of the physical, psychological or social functioning of humans or human organs’.

13.2.48 Several sources identify the potential for direct permanent hearing damage at high noise levels (Cambridgeshire Health Authority, 2000; Soderlund et al., 1996; Southampton and South West Hampshire Health Authority, 2001; World Health Organisation, 1999); furthermore, Cambridgeshire Health Authority (2000) note that the likelihood of hearing damage is related to both the level of sound and its duration. Noise induced aural pain is also cited by Southampton and South West Hampshire Health Authority (2001) as a direct effect of high noise levels, although in sensitive individuals (e.g. when there is inflammation) the threshold for this occurring would be lower.

13.2.49 Impacts due to lesser levels of noise can include disturbed sleep, interrupted study, general annoyance, interference with speech communication, effects on performance and child health and anxiety/psychological stress (Cambridgeshire Health Authority, 2000; McCarthy, 1999; Southampton and South West Hampshire Health Authority, 2001; Shield and Dockrell, 2002; World Health Organisation, 1999). Southampton and South West Hampshire (2001) and World Health Organisation, (1999) cite evidence suggesting secondary health impacts such as cardiovascular disease (including hypertension and ischemic heart disease), immune system effects and altered social behaviour/mental health effects associated with noise. However, linkages with environmental noise as opposed to occupational noise appear to be generally less well established and effects are more likely to be contributory rather than causal.

13.2.50 Cambridgeshire Health Authority (2000) attribute the level of annoyance to the noise source, stating that ‘the annoyance factors are greater for the same noise levels for air traffic noise compared to road traffic noise, which exceeds rail traffic noise’. The exact degree of effect attributable to these lower levels of noise may be dependent on a number of factors, not least the sensitivity of the individual; vulnerable groups have been identified as people with a hearing impairment, the elderly, foetuses, babies and children, blind people, people in hospital or rehabilitating at home, people with particular diseases/medical problems (e.g. high blood pressure), depressed people and people doing complex cognitive tasks. The World Health Organisation (1999) attributes further non-
acoustic factors as determining the degree of annoyance experienced, including those of a social, psychological or economic nature.

13.2.51 Despite the information presented above, McCarthy (1999) identifies a general lack of information regarding noise levels and health impacts, particularly across London. SAHSU (2000) also identifies a lack of routine data sources for noise pollution, and its reported effects on sleep disturbance and psycho-social well-being, with the latter point also being picked up by Soderlund et al (1996). In fact, studies reported by Smith et al., (2002) suggest that associations between noise, sleep disturbance and health for the lower levels of noise are not supported.

13.3 Consultations

13.3.1 The principal consultations regarding the health assessment have been with the Camden Primary Care Trust (also representing the Islington PCT and the Kings Cross HIA Advisory Group). Comments made during the scoping and subsequent stages in the Environmental Impact Assessment have been centred around the methodological approach, appropriate baseline data use and availability and appropriate selection of determinants/indicators. The continuation of meetings with PCT representatives, following the initial submission of the consultation draft Environmental Assessment Scoping Report, has enabled issues to be readdressed as the Health Chapter has progressed.

13.3.2 The principal methodological issues have been addressed through considerable literature review, to bring the assessment in line with current best practice (albeit that there are few comparable assessments in the UK at the present time). The scoping responses have been incorporated as an information source into the assessment, and determinants/indicators have been developed following literature review (in particular the Greater London Authority's 'Health in London' publications). These have been the subject of subsequent discussions with PCT representatives, in which the selected determinants have been ratified and added to.

13.4 The Existing Situation

Health of Existing Communities

Determinants of Health (Socio-economic factors)

Unemployment

13.4.1 Employment/unemployment data for the Central and Wider Impact Zones (as contained in the Socio-economic Report, Part 12) are summarised in the table below.
### Table 13.2: Summary unemployment statistics for the Central and Wider Impact Zones

<table>
<thead>
<tr>
<th></th>
<th>Central Impact Zone</th>
<th>Wider Impact Zone</th>
<th>London average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economically active 16-75 year olds</td>
<td>38.5%</td>
<td>42.9%</td>
<td>51.3%</td>
</tr>
<tr>
<td>Estimated unemployment level (based on claimant count)</td>
<td>11-12%*</td>
<td>11-12%*</td>
<td>6%</td>
</tr>
</tbody>
</table>

* Likely to be an underestimation due to data collection method, real unemployment figure estimated to be 15-20%

13.4.2 This data shows significant levels of unemployment prevalent throughout the impact areas in comparison with London averages. Further details/statistics regarding unemployment are provided in the Socio-economic Report (Part 12).

13.4.3 With regard to duration of unemployment, the table below provides data from Census 2001 describing the number of people defined as ‘long term unemployed’. This is based on the number of people reporting to have not worked since 1999 or earlier.

### Table 13.3: Summary long term unemployment statistics for the Central and Wider Impact Zones

<table>
<thead>
<tr>
<th></th>
<th>Central Impact Zone</th>
<th>Wider Impact Zone****</th>
<th>London</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of unemployed people aged 16-74 who are ‘long term unemployed’*</td>
<td>603</td>
<td>752</td>
<td>72,062</td>
</tr>
<tr>
<td>Number of all people aged 16-74*</td>
<td>27046</td>
<td>49559</td>
<td>5,300,332</td>
</tr>
<tr>
<td>People ‘long term unemployed’ as a percentage of all unemployed people aged 16-74*** (average across wards)</td>
<td>36.94%</td>
<td>30.6%</td>
<td>31.19%</td>
</tr>
<tr>
<td>People ‘long term unemployed’ as a percentage of all people aged 16-74**** (average across wards)</td>
<td>2.2%</td>
<td>1.5%</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

*from TableKS09AN, Census 2001 (accessed via www.statistics.gov.uk, neighbourhood statistics);

***from TableKS09AP, Census 2001 (accessed via www.statistics.gov.uk, neighbourhood statistics);

13.4.4 This indicates that alongside an unemployment rate exceeding the London average (see Table 13.2) within the Central Impact Zone, those that are unemployed have been so for a proportionally longer period of time.
Ethnicity and Unemployment

13.4.5 The Socio-economic Report (Part 12) shows a diverse ethnic mix in the Central and Wider Impact Zone areas. This is at its most extreme in the King’s Cross ward where only 37.2% of the population are ‘British white’. Principal Black and Ethnic Minority Groups are Bangladeshi, African, Chinese and Indian. Whilst no information is available at ward level with regard to the employment characteristics of these groups, all-London data (Greater London Authority, 2003) indicates that Bangladeshi groups are significantly disadvantaged in employment terms, with unemployment rates more than five times that of White British groups, followed by Black Africans (unemployment over three times that of White British). Indian groups show marginally higher unemployment (less than 1.5 times that of White British groups) and Chinese figures were unavailable due to small sample size.

13.4.6 In the Report on the Survey of Households in King’s Cross (Mutale and Edwards, 2000), it is stated that ‘although adults from Black and Bangladeshi households comprised about 15-16% of the sample, they accounted for 20-23% of the unemployed total in the sample and were therefore over-represented. On the other hand, the proportion of White adults in the sample was nearly 69% while their unemployed accounted for 37% of the total ILO [International Labour Office] unemployment’.

13.4.7 Further details/statistics regarding ethnicity and unemployment are provided in the Socio-economic Report (Part 12).

Educational attainment

13.4.8 The analysis in the Socio-economic Report (Part 12) indicates variable educational attainment across the Central and Wider Impact Zone areas, with some schools performing above borough and London averages, and others falling below. It also highlights the investment and attention given to educational attainment in recent years through a range of initiatives, which have been shown to be successful. However, skill levels and related adult education has been shown to be relatively poor, with a greater number of people in the Central Impact Zone having no qualifications compared to the London average. Within the Wider Impact Zone, however, absence of qualifications is, on average, similar to the London rate. The two wards most significantly deficient are St Pancras and Somers Town and Caledonian.

13.4.9 As with employment, disproportionate amounts of Black and Ethnic Minority groups are under-performing in educational attainment. The King’s Cross Household Survey 2000 indicates that, within the Bangladeshi population, only 7% were educated to degree level (compared to 41% of Black households and 33% of White) and 36% reported difficulty with speaking, reading, writing or understanding English (compared to 12% of all households). This is likely to be strongly related to the employment issues discussed above.

13.4.10 Further details/statistics regarding educational attainment are provided in the Socio-economic Report (Part 12).

Proportion of homes judged unfit to live in

13.4.11 Lack of basic amenities (equating to damp and cold conditions with a range of health effects as described in Section 13.2) varies across the boroughs, with the percentage of most severely lacking properties being more than four times the England average and just under twice the London average.
13.4.12 Details regarding household amenities collected for the 2001 Census give an indication of the housing quality within the study area. Summary details of the findings are presented below. Furthermore, the Camden Health Improvement and Modernisation Plan (HIMP) (Camden and Islington Health Action Zone, 2002b) identifies 14,000 dwellings within Camden and Islington as being unfit for habitation.

13.4.13 The data indicates overcrowding above London and England rates in both the Central and Wider Impact Zones (as averages). Bloomsbury and King’s Cross wards have the highest percentage of households with an occupancy rating of –1 or less\(^1\), more than twice the London average and more than six times the England average.

13.4.14 The data also emphasises the prevalence of high-rise accommodation in the area, with large percentages of households living in basement and 5th floor and above accommodation. Of particular note in this regard is the ward of Bloomsbury where the percentage of households living on the 5th floor or above is over 23 times the England average and over six times the London average.

13.4.15 Further details/statistics regarding housing issues are provided in the Socio-economic Report (Part 12).

Table 13.4: Housing quality within the Central and Wider Impact Zones (Source: Census, 2001)

<table>
<thead>
<tr>
<th></th>
<th>Central Impact Zone average</th>
<th>Wider Impact Zone (excluding the Central Impact Zone) average</th>
</tr>
</thead>
<tbody>
<tr>
<td>with an occupancy rating of –1 or less(^1)</td>
<td>34.08</td>
<td>31.37</td>
</tr>
<tr>
<td>without central heating or sole use of bath/shower and toilet</td>
<td>0.27</td>
<td>0.48</td>
</tr>
<tr>
<td>Lowest floor level: basement or semi-basement</td>
<td>11.58</td>
<td>13.61</td>
</tr>
<tr>
<td>Lowest floor level: 5th floor or higher</td>
<td>7.21</td>
<td>8.54</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range</th>
<th>London average</th>
<th>England average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Impact Zone</td>
<td>23.9 (Barnsbury)</td>
<td>17.32</td>
</tr>
<tr>
<td></td>
<td>43.45 (Bloomsbury)</td>
<td>0.38</td>
</tr>
<tr>
<td>Wider Impact Zone (excluding the Central Impact Zone)</td>
<td>0.19 (St Pancras and Somers Town)</td>
<td>2.75</td>
</tr>
<tr>
<td></td>
<td>4.2 (St Pancras and Somers Town) to (0.73 Bloomsbury)</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>21.18 (Barnsbury)</td>
<td>(Bloomsbury)</td>
</tr>
<tr>
<td></td>
<td>1.38 (Cantelowes) to 16.32 (Bloomsbury)</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>4.25</td>
<td>2.75</td>
</tr>
</tbody>
</table>
| Crime

13.4.16 Table 13.5 below indicates the level of crime, occurring within the boroughs of Camden and Islington.

\(^1\) The occupancy rating provides a measure of under-occupancy and overcrowding. For example; a value of -1 implies that there is one room too few and that there is overcrowding in the household. The occupancy rating assumes that every household; including one person households, requires a minimum of two common rooms (excluding bathrooms).
Table 13.5: Crime rates within the Boroughs of Camden and Islington (Source: Neighbourhood Statistics, National Statistics Online)

<table>
<thead>
<tr>
<th>Offences recorded, rate per 1000 population (April 2000-March 2001)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violence against the person</td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>England</td>
</tr>
<tr>
<td>London</td>
</tr>
<tr>
<td>Camden</td>
</tr>
<tr>
<td>Islington</td>
</tr>
</tbody>
</table>

13.4.17 This table indicates relatively high crime rates within the two boroughs in comparison with both England and London averages. Burglary rates, in particular, are just under twice the England average, and over one and a half times the London average.

13.4.18 Furthermore, the Camden Central Health Needs Assessment (covering an area beyond that of the Wider Impact Zone), reported that 84% of respondents felt that violence affected their local community, and 56% of young people said that they were affected by the violence in their community (Ison, 2003a). The same survey also identified the following groups as having particular fear of crime: older people in the English community; older people in the Irish community; women who had children between 0-4 years of age; and, adults in the Bangladeshi community (Ison, 2003a).

13.4.19 Further details/statistics regarding crime are provided in the Socio-economic Report (Part 12).

**Social Capital**

13.4.20 There are few measurable indicators available to assess social capital. As described in Section 13.2 social capital comprises trust, reciprocity, local identity, civic engagement and community cohesion (Putnam, 1993; cited in Cave et al., 2001). However, the more identifiable (and recordable) factors that can contribute to social capital include community connectivity and interaction and availability of community facilities including public realm/open space.

13.4.21 The Socio-economic Report (in Part 12) has highlighted a number of different communities within the Central and Wider Impact Zones, linked together by diverse bonds such as religion, ethnic origin, place of residence, place of work, social clubs or travel needs. However, the most striking feature of these communities is the contrasting presence of a high level of population transience alongside the presence of large well-established groups that have lived in the area for several generations – these groups tend not to mix well and both feel poorly served by local services, housing markets and facilities (Mutale and Edwards, 2002).

13.4.22 Whilst there is evidence of strong social capital within small communities in the King’s Cross area, there are also significant indications of distrust, animosity and wide discrepancies between levels of participation and social inclusion, with the gap between the transient and well-established communities likely to be the greatest. In addition, the development site itself currently represents a physical barrier between geographically disparate communities on the Camden and Islington sides.
With regard to community facilities, the Socio-economic Report (Part 12) provides the following information:

- Community centres - the area is well served by the number and type of buildings, however, not all groups have access - there is limited outreach/publicity regarding activities held and many buildings are under resourced and/or under-utilised.
- Nursery provision – for the over 3’s in the Central Impact Area has adequate capacity, although affordability excludes those on low incomes; for the under 3’s the Central Impact Zone is under-resourced.
- Religious facilities – there is an under supply of Muslim meeting places.
- Open spaces – in the Central Impact Zone public open spaces in the ‘local park’ and ‘small open space’ classifications dominate. In the Wider Impact Zone ‘small open spaces’ dominate with limited space in the south-east and west of the area. For both the Central and Wider Impact Zones, use is generally informal/passive, with few dedicated sports areas. Further information (and a discussion of ‘deficiency’ measures) is presented in the Socio-economic report (Part 12).

Determinants of Health (Physical environment factors)

Air quality indicators

The London Boroughs of Camden and Islington have already identified potential exceedences of the nitrogen dioxide and PM10 objectives and both Boroughs have been declared Air Quality Management Areas. This is confirmed by monitoring and modelling data which show generally higher concentrations on approaching the centre of London, with the highest concentrations close to the busiest roads.

Road traffic accidents

The transport environment of the development site and its locality is influenced by a plethora of public transport options (National Rail, London Underground and bus services), however existing walking and cycling connections are relatively poor, compounded to some degree by construction works associated with CTRL and LUL. With regard to overall accessibility, the site itself is currently largely inaccessible to the public whereas the surrounding area is considered to be highly accessible. With regard to the highway network, the site is located close to the strategic road network (A501 Euston Road and A503 Camden Road) which provides connections to local urban areas as well as the A406 North Circular Road and A40 Westway.
13.4.28 Data regarding road traffic accidents is not available at ward level. However, information contained within Camden’s Interim Road Safety Plan 2002-2003 (Camden Borough Council, 2001) reveals that a total of 1,653 road casualties were reported in 2000, comprising 8 No. fatalities, 242 No. serious injuries and 1,403 No. slight injuries (in this context, a fatality is where a person dies from their injuries within 30 days of the collision; a serious injury includes concussion, fractures, internal injuries, crushing, severe cuts, severe shock, or injuries which require hospital treatment, as well as people who die from their injuries more than 30 days after the collision; and, a slight injury is a minor one, such as a sprain, cut, bruise, or slight shock requiring roadside attention). Slight injuries, whilst minor, are important as they contribute to the perception and the reality of road danger – this class of injury is also likely to be under-reported (Camden Borough Council, 2001). Comparable information was not available for Islington borough at the time of writing.

13.4.29 The following table puts the Camden borough level data in a London context.

<table>
<thead>
<tr>
<th></th>
<th>Total number of casualties (2000)#</th>
<th>Estimated population (2000)*</th>
<th>Estimation of casualties per person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camden</td>
<td>1,653</td>
<td>203,662</td>
<td>0.00812</td>
</tr>
<tr>
<td>London</td>
<td>45,887</td>
<td>7,375,000</td>
<td>0.00622</td>
</tr>
</tbody>
</table>


13.4.30 This suggests a higher accident rate in Camden than the London rate. Accident information available for Camden indicates a high occurrence of pedestrian accidents in the area (48 pedestrian accidents out of a total of 222 for York Way). This is likely to be related to the crossing points across the roads increasing the potential for conflicts between cars and pedestrians. Vehicle accidents are reported to be predominantly shunt types due to the stop-start nature of the traffic in the area.

13.4.31 Further details regarding traffic flows can be found in the Transport section of the Environmental Statement (Section 5.3).

**Noise**

13.4.32 The main sources of noise affecting the site (road and rail traffic) would be significantly altered by 2006/7 and therefore surveys of the existing situation have not been considered to be appropriate.

13.4.33 Further details regarding noise and vibration can be found in the Noise and Vibration Specialist Report (Part 17).
Health based statistics

Life expectancy at birth

13.4.34 ‘Average life expectancy at birth is a summary statistic derived from mortality at all ages’ (Greater London Authority, 2002). As such, the potential influences are vast and would comprise genetic, socio-economic, environmental, lifestyle and amenity influences. However, it has been included in this chapter (as in the Greater London Authority, (2002) document) as a ‘summary indicator of the health status of the population’.

13.4.35 Statistics regarding life expectancy are available from Camden and Islington Health Authority (2001). Figures provided are based on 1998-2000 pooled data, and are in ranges for women of less than 80, 80, 81 and 82 years or above, and for men of less than 71, 71-73 and 74-76 years. The ward data for the Central and Wider Impact Zones (based on old ward boundaries) is summarised below:

- Within the Central Impact Zone, life expectancy for women is lowest for Holloway and Somers Town (less than 80 years).
- Within the Wider impact Zone, life expectancy for women within the lowest range (less than 80 years) is seen in Holborn ward.
- Within the Central Impact Zone, life expectancy for men is lowest for King’s Cross and Somers Town wards (less than 71 years).
- Within the Wider Impact Zone, life expectancy for men within the lowest range (less than 71 years) is seen in Bloomsbury and St Pancras wards.

13.4.36 In general, life expectancy for men in Camden and Islington is one and a half years less than both the London and national averages; for women however it is approximately 5 months greater than the England average.

Infant mortality rate

13.4.37 Another summary statistic, infant mortality rate is again influenced by a variety of factors. However, there is disparity between social classes, single/both parents and people born inside/outside the UK (Greater London Authority, 2002).


- The infant mortality rate in Camden for the period 1996-2001 is 4.9 (per 1000 births). This is lower than both the London and England and Wales averages, although higher (by 0.3) than the 1993-1998 period.
- The infant mortality rate in Islington for the period 1996-2001 is 5.4 (per 1000 births). As seen in Camden, this rate is below the London and England and Wales averages, but higher (by 0.7) than the 1993-1998 period.
- For both boroughs, the infant mortality rate was considered to be ‘significantly low’ for the 1993-1998 period, but has since risen out of this bracket.

Proportion of people with self-assessed good health

13.4.39 Self-assessment data has an important function because it tells us ‘how people are feeling generally and not just whether they have specific conditions’ (Greater London Authority, 2002).
The results of surveys of self assessed health for the wards within the Central and Wider Impact Zones for 2001 (based on 2001 Census data and new ward boundaries) are summarised below:

- Within the Central Impact Zone, the percentage of respondents reporting good health ranged from approximately 65% to 71%, and ‘not good’ health between approximately 9% and 12%.

- Of the three wards within the Central Impact Zone, only King’s Cross residents reported levels of good health that exceeded the London and England averages – the remaining wards fell below both England and London figures.

- Reporting of poor health followed a similar pattern – King’s Cross residents reported ‘not good’ health in approximately 9% of cases, this was less than the England average but more than that for London; ‘not good’ health was reported within the remaining wards at levels above both England and London averages.

- Reporting of ‘good health’ within the Wider Impact Zone ranged from approximately 65% to 72%, and ‘not good’ health between approximately 8% and 12%.

- Within the Wider Impact Zone, residents of Bloomsbury, Cantelowes, Barnsbury and Clerkenwell, assessed their health as ‘good’ at levels exceeding the England average. However, of these, only Bloomsbury exceeded the London average and all, again with the exception of Bloomsbury, reported ‘not good’ health at higher levels than the average for England and London.

**Other health data**

Ison (2003a) reports that people living in King’s Cross, Somers Town, St Pancras, Thornhill and Holloway wards have higher rates of death from all causes, heart disease, cancer and accidental injury than people in England and Wales. In addition, local admission rates for respiratory diseases are generally higher than average.

Mental health issues are reported to be particularly pertinent to Camden and Islington. A crude understanding of the magnitude of mental health issues within the boroughs can be obtained through looking at suicide and undetermined injury rates. In this regard, Camden and Islington Health Authority (2001) states that ‘with a suicide rate 60% higher than expected given the age structure of the population, Camden and Islington ranks second from bottom amongst the 99 health authorities in England’. London as a whole, however, reflects the national average. Of the two boroughs, Camden has the highest standardised mortality rates for suicide and undetermined injury, ranking the worst local authority in England, with considerable polarity seen within the borough. This trend is also reported in the Camden Health Improvement and Modernisation Plan (Camden and Islington Health Action Zone, 2002b).

Tuberculosis (TB) notification is reported by Ison (2003a) to be higher in both Camden and Islington boroughs, compared with London and national averages. Furthermore, the rate for all minority ethnic groups in Camden and Islington is considerably higher than the White population. The Camden and Islington Health Authority (2001) states that ‘the Camden and Islington figure of 44 notifications per 100,000 persons is over four times the national rate, placing the area in the bottom five percent of health authorities in England’.
13.4.44 Surveys undertaken of adults and Year 10 schoolchildren and reported by Ison (2003a) reveal a high prevalence of behaviours damaging to health within Camden and Islington boroughs. These include smoking, alcohol consumption, lack of physical exercise, illicit drug use and sexual behaviour. Furthermore, the Camden Health Improvement and Modernisation Plan (Camden and Islington Health Action Zone, 2002b) identifies substance misuse as a ‘particularly significant health and social care issue for the residents of Camden and those in neighbouring Islington’.

13.4.45 Table 13.7 below sets out ward level data within the Central and Wider Impact Zones that is publicly available.

13.4.46 The indicators confirm that the actual and perceived health of the King’s Cross population is generally below national average.

**Table 13.7: Health data available from Census 2001**

<table>
<thead>
<tr>
<th>Variables</th>
<th>All people</th>
<th>Limiting long term illness</th>
<th>General health</th>
<th>Provision of unpaid care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>% of people with population with working age</td>
<td>% of people with limiting long-term illness</td>
<td>% of people whose health was: Good</td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>England</td>
<td>49138831</td>
<td>17.93</td>
<td>13.29</td>
<td>68.76</td>
</tr>
<tr>
<td>London</td>
<td>7172091</td>
<td>15.49</td>
<td>11.87</td>
<td>70.82</td>
</tr>
<tr>
<td>Camden</td>
<td>198020</td>
<td>15.82</td>
<td>13.06</td>
<td>71.27</td>
</tr>
<tr>
<td>Islington</td>
<td>175797</td>
<td>17.87</td>
<td>15.21</td>
<td>68.01</td>
</tr>
<tr>
<td>Bloomsbury</td>
<td>9224</td>
<td>13.67</td>
<td>9.98</td>
<td>72.16</td>
</tr>
<tr>
<td>Camden</td>
<td>10490</td>
<td>17.45</td>
<td>15.55</td>
<td>69.36</td>
</tr>
<tr>
<td>Holborn</td>
<td>10645</td>
<td>17.93</td>
<td>15.42</td>
<td>68.36</td>
</tr>
<tr>
<td>Covent Garden</td>
<td>11143</td>
<td>14.65</td>
<td>13.47</td>
<td>71.38</td>
</tr>
<tr>
<td>King's Cross</td>
<td>11964</td>
<td>17.66</td>
<td>15.77</td>
<td>67.25</td>
</tr>
<tr>
<td>Regent's Park</td>
<td>12490</td>
<td>19.76</td>
<td>19.16</td>
<td>66.32</td>
</tr>
<tr>
<td>St Pancras and</td>
<td>10274</td>
<td>16.19</td>
<td>14.06</td>
<td>69.76</td>
</tr>
<tr>
<td>Somers Town</td>
<td>11566</td>
<td>18.74</td>
<td>16.18</td>
<td>65.09</td>
</tr>
<tr>
<td>Barnsbury</td>
<td>9773</td>
<td>17.02</td>
<td>13.47</td>
<td>69.06</td>
</tr>
<tr>
<td>Holloway</td>
<td>11214</td>
<td>20.03</td>
<td>17.39</td>
<td>64.8</td>
</tr>
</tbody>
</table>

Note: Highlighted cells indicate those which perform worse than the London and/or England average, excluding columns marked with a #

**Health inequalities and vulnerable groups**

13.4.47 The Camden Health Improvement and Modernisation Plan (Camden and Islington Health Action Zone, 2002b) highlights the severity of some of the health inequalities amongst the impact area population. For example:

- **Life Expectancy**: Camden ranked 22nd out of 32 London Boroughs for male life expectancy. Men in Somers Town ward have a life expectancy of 68 years, compared to a national average of 75 years.

- **Cancer**: St Pancras ward has the highest cancer mortality rate (Standardised Mortality Rate of 166) in the Borough.

- **Cardiovascular Disease**: the risk of cardiovascular disease amongst the Camden South Asian population (much of which is concentrated in the King’s Cross Area) is one and a half times higher than the national average.
Mental Health: the worst nine Camden and Islington wards (many of which are within the Wider Impact Zone) have a combined admissions rate three times greater than the best nine.

**Health Services**

13.4.48 Ison (2003a) reports that access to primary health care is poor in the King’s Cross area, particularly for Black and Minority Ethnic Groups. One of the principal indicators of primary health care capacity is the level of GP services. The National Patient Survey undertaken as part of the NHS Primary Care Trusts Survey of Local Health Services 2003 provides a comparison of the performance of PCTs within England with regard to patient responses on various aspects of GP performance. Of the seven questions posed within the survey, Camden and Islington PCTs performed within the worst 20% of all PCTs for four (Camden) or five (Islington) of the responses. Within this survey, Islington PCT was situated at the bottom of the worst 20% for ‘how long did you wait for a GP appointment?’.

13.4.49 Current primary health care services in the King’s Cross area predominantly cater for the needs of a residential population, with specialist services available for specific local needs (such as sex workers and drug users). Surveys of the Central Impact Zone suggest that the area currently contains:

- 9 GP practices, with a total of 15 GPs
- 12 of these GPs are in practices within Camden
- only 3 GPs are located in Islington (in 1 practice)
- 5 practices had additional language capabilities (other than English), including French, Arabic, Greek, Portuguese, Gurjarati and Hindi
- 4 dental practices
- pharmacies; and
- no opticians

13.4.50 The demographic data contained with the Socio-economic Report (Part 12) section indicates a population of 35,469 within the Central Impact Zone. This equates to approximately 2,365 people per GP, much higher than the national average of 1,800 people per GP.

13.4.51 Indicators confirm that demand for health services is higher in the area, with expenditure on GP prescribed drugs for mental health higher per patient per practice than in the rest of Camden and Islington. Indeed, Camden and Islington are ranked first and third worst in terms of need for mental health services amongst the London boroughs (Camden and Islington Health Authority, 2001). Admission rates to Accident and Emergency are also higher for children between 0-3 years from Camden ward than those in the rest of the borough (Ison 2003a). Older people, the NHS’s largest consumer group, resident within Camden and Islington boroughs, demonstrate illness and disability rates in line with national rates (Camden and Islington Health Action Zone, 2002b).

13.4.52 40% of the practices in the Central Impact Zone have only one GP, and all but the Ampthill Square Medical Centre in Camden (St Pancras and Somers Town ward) have less than 4. Smaller practices find it more difficult to provide the range of health services
demanded by local residents and tend not to be able to sustain specialist clinics and permanent nursing staff.

13.4.53 Between 2001 and 2007 the number of GP practices in the Wider Impact Zone is likely to decrease as services are absorbed by expanding health centre activity and a stronger focus on a smaller number of bigger practices with ‘one stop shop’ facilities is introduced. The range of health services available should therefore expand. For example:

- in the former Clerkenwell ward two GP practices will be consolidated and relocated in the period 2001-2007 to help create greater service provision in the area.
- in the former Barnsbury ward a GP surgery is to expand in 2002/3 to help cater for the increased demand of services, and
- in the former Thornhill ward a new practice is planned, which is due to become operational in 2004.

13.4.54 One of the principal obstacles to improving health services locally is the difficulty in attracting staff. Camden GP practices and health centres report high vacancy rates, including 16.7% for health visitors (compared to 2.2% for England), 16.2% for midwives (compared to 2.8% for England) and 12.9% for district nurses (compared to 2.2% for England) (Ison, 2003a). Additional difficulties are present in the need to cater for an ethnically diverse population and the specific needs that they represent. For example, for the older population, where the ethnic proportion is increasing, different patterns of illness within these groups (e.g. Black African and Black Caribbean people are twice as likely to have a stroke) need to be addressed (Camden and Islington Health Action Zone, 2002a and 2002b).

13.5 Baseline 2006/7

13.5.1 The Socio-economic and other Specialist Reports have considered most of the factors that influence the selected indicators described in Section 13.2. These have been used as a basis for considering probable local health conditions for the 2006/7 baseline, with some commentary on the implications for health services. With regard to the summary health statistics, it is expected that any changes would result from changes seen in the other determinants of health.

13.5.2 Camden and Islington Health Action Zone have prepared Health Improvement and Modernisation Plans for the period 2002 to 2005 (to be adopted by the Camden and Islington PCTs). Their aim is to bring together ‘the agenda for health improvement and tackling inequalities across [the boroughs] through the action of its NHS community and partners, particularly the Local Authority and others’ (Camden and Islington Health Action Zone, 2002a and 2002b). Targets and action plans are proposed for priority areas including, *inter alia*, cancer, cardiovascular disease, mental health, children and young people, older people, prisons, sexual health, infection and substance misuse. Whilst improvements are likely to arise from this co-ordinated action, without measures to address the extreme transience within the area, it is unlikely that community health would change significantly.
Determinants of Health (Socio-economic factors)

Unemployment

13.5.3 The Socio-economic Report (in Part 12) projects some growth in local employment generated by new development and investment in employment brokerage and local training programmes. The London Development Agency Local Labour Initiative has recently been launched initially focussing on construction training but broadening its programme to coincide with new employment opportunities as they emerge. In addition, the Camden Central Single Regeneration Budget is aimed at community development and access to opportunities. Whilst these factors suggest a growth in local employment and possible fall in unemployment, it is unlikely to be significant in a wider context, unless population transience is addressed. It is expected that the proportion of people with long-term unemployment would remain at a similar rate to existing levels.

Ethnicity and Unemployment

13.5.4 Continuing diversity of Black and Minority Ethnic groups is expected by 2006/7. To a degree new communities are likely to replace rather than add to existing numbers as there are only minor additions to local housing stocks in the pipeline. Without accurate records of current unemployment levels amongst Black and Minority Ethnic groups it is difficult to predict change. The proportions of Black and Minority Ethnic unemployed are likely to be similar to current levels.

Educational attainment

13.5.5 In general, Camden Primary and Secondary Schools in the area have been gradually improving in performance over the last four years. However, the Socio-economic Report concludes that the quality of school provision is unlikely to continue to improve at the rate that many of the schools have over the past few years. Performances have generally improved over the past few years due to specific programmes targeting schools.

13.5.6 While these programmes have either ceased or are nearing completion, the principles established during them have been adopted by the local education authorities (London Borough of Camden, 2003) and should therefore help to maintain current levels of performance. However, further dramatic leaps in performance are unlikely without major changes to the local education system. Therefore school performance has been projected to remain at equivalent levels to current indicators.

Proportion of homes judged unfit to live in

13.5.7 The area has benefited from extensive housing renewal and refurbishment programmes instigated by the Local Authorities. Most of the worst social housing stock is now nearing completion of refurbishment works (mainly focussed on Somers Town) or forms part of a wider housing renewal programme (mainly in Islington estates, particularly Naish Court). This work will have a significant impact on local housing quality by 2006/7. However, the area's problem will not be completely eradicated as stock on the Bemerton Estate and other estates remains in a poor condition and private rented stock in King's Cross shows little evidence of recent investment.
Improvements in housing stock would not necessarily address local overcrowding issues. There is little increase in local social or affordable housing numbers projected for 2006/7, although borough wide increases may help to relieve some of the current overcrowding problems for those that are prepared to move away from King’s Cross.

**Crime**

There is a range of criminal activity in King’s Cross that negatively affects residents in different ways. The Greater London Authority (2002) view domestic burglary as a major contributor to poor health in general. However, drug taking, drug selling and criminal behaviour associated with drugs and prostitution are amongst local residents’ main concerns.

The Socio-economic Report (Part 12) states: “Of the five major developments that will occur before 2007, the Regent Quarter scheme and the completion of the Channel Tunnel Rail Link (and International Station) are likely to have the greatest impact on the image and perception of King’s Cross. The changing character of the area and the removal of many of the focal points for criminal activity brought about by these and other developments is likely to help reduce the attractiveness of the area for certain types of criminal activity (drug dealing and prostitution in particular). It is difficult to quantify the extent of this effect but a reduction in criminal activity is expected”.

However, crime rates in housing areas in the Central Impact Zone (particularly antisocial behaviour) that do not necessarily relate to the drugs and prostitution activity of the wider area are unlikely to fall dramatically without significant improvements in local social, economic and physical conditions. For these areas the current situation is therefore likely to remain in 2006/7.

**Social capital**

The less measurable elements of social capital would be expected to follow the trends described above as well as those for ‘general health’ (see below), and therefore no significant change is projected. Few changes to the more physical components of social capital (community facilities and open space) have been assumed in the Socio-economic Report (Part 12). It estimates only limited changes in open space and child facilities, insufficient capacity for non-denomination meeting places and improved use of community centres potentially leading to a reduction in capacity.

**Determinants of Health (Physical environment factors)**

**Air quality indicators**

The available information suggests that air quality would improve over the next 10 years, however objectives for nitrogen dioxide and PM10 would continue to be exceeded in 2007 at some locations (mostly roadside). This represents the continuation of current poor air quality conditions which may be harmful to human health. This is likely to be the case, even with action plan measures (developed by the Local Authority in response to the Air Quality Management Area designation) in place.
Road traffic accidents

13.5.14 Given the lack of detailed geographic information and analysis regarding road traffic accidents, it is not possible to provide a quantitative estimate of the 2006/7 baseline. However, for the purposes of the assessment that follows (which is qualitative), the relationship between the Camden road traffic accident rate and that for London is not expected to change significantly.

Noise

13.5.15 Road traffic noise levels (at 10m from the road) at various locations in the vicinity of the site are predicted to range between 67.8 dBA10. 1 hour (Royal College Street) and 76.7 dBA10. 1 hour (Euston Road). These noise levels are characterised by predicted traffic flows (taking into account permitted development schemes including Regent Quarter as well as the effect on traffic flows as a result of Congestion Charging) and developments to the rail infrastructure in the area, including the Channel Tunnel Rail Link.

General health

13.5.16 Health conditions in the Central and Wider Impact Zones are closely associated with poverty and deprivation and are influenced by a number of different socio-economic factors. Given that area-wide deprivation levels, employment and income are not expected to show dramatic improvements between 2003 and 2007 it is unlikely that the health of the population in 2007 would differ significantly from the current situation.

13.5.17 A greater sense of poor health amongst local residents compared to London averages reflects statistical evidence of greater numbers of people suffering long term limiting illnesses and other disease based indicators. However, it may also reflect negative perceptions of construction and traffic impacts on health due to the area’s position on the road network and the extent of CTRL construction work currently taking place. These two factors are likely to continue throughout the next four years, with construction work on CTRL and related Underground facilities tailing off towards 2007. Therefore it is unlikely that perceptions of poor health in 2007 would dramatically differ from perceptions now.

13.5.18 If any change in health profile is to occur it is expected to be one of declining health. Based on recent trends this is most likely to occur for tuberculosis and mental health (Fahey and Ison, pers comm).

Health service demands

13.5.19 The potential change in services need has been assessed based on the predictions for the determinants of health above.

13.5.20 Predictions for unemployment and ethnicity and unemployment suggest that local health services would be expected to meet disproportionately high needs in 2006/7, similar to current levels, if not marginally greater.

13.5.21 Initiatives to improve educational attainment currently underway would increase school leavers’ abilities to gain employment and higher income. It should also result in better health outcomes in adult life and greater knowledge of health issues leading to decreased demands on local health services. However, it would be more than three years before these benefits have a significant impact on local indicators as most pupils benefiting now would not be entering the labour market until after 2006/7 and would not display
improvement in many adult health outcomes for many years. Therefore, no perceptible impact on health services would be expected by 2006/7.

13.5.22 By 2006/7 housing related illness is likely to have decreased slightly, with conditions improving marginally for existing and new social housing residents. Private sector conditions may improve as landlords invest money in their stock. However, there is little guarantee that existing residents would benefit from this as they may be replaced by occupiers willing to pay higher rent. Evidence of this process is already available, but it is unlikely to significantly influence health service provision and the private rented sector is, in any event, relatively small in the immediate area.

13.5.23 Some improvements in crime rates are expected, although again unlikely to significantly alter health service provision. The same applies to effects/needs arising from social capital conditions.

13.5.24 With regard to the factors that relate more to the physical environment (air quality, road traffic accidents and noise), there are no changes projected that would appreciably increase or decrease service provision requirements.

13.5.25 Overall the health profile is expected to change little, or possibly decline, in the area, putting the same or marginally increased pressure on an already over-capacity service.

13.6 Proposals

13.6.1 The King’s Cross Central proposals are defined by the Development Specifications for the Main Site and the Triangle Site incorporating Parameter Plans, and in the case of the Main Site, Landscape Proposals Plans

Assumptions

13.6.2 The assumptions made during the assessment of the determinants of health (in other sections and specialist reports within the Environmental Statement) are carried through into this health report (which is based on those assessments). Thus, the proposals assessed and assumptions made are those forming the basis of the contributing chapters (socio-economic, air quality, noise and transport). For provision of health services, the assessment is based on population numbers predicted during the socio-economic analysis (Part 12).

Worst Case

13.6.3 Given that the health assessment principally relies on the assessments of its determinants, there is not a single definitive ‘worst case’. Therefore the assessment follows the ‘worst case’ approaches adopted for each of the other assessments.

13.6.4 The Socio-economic assessment considers two scenarios that give rise to the greatest (largest) impacts from new jobs and population created by development. These scenarios generate different effects on socio-economic conditions and place different pressures on existing and new community services. The floorspace and uses on the Triangle are the same in both scenarios. The differences between them lie, therefore, on the Main Site, where the development specification would permit different combinations of floorspace and units, with different socio-economic effects.
13.6.5 Both ‘worst case’ scenarios are described in detail in Table 12.15 in the Socio-economic Report (providing floorspace and unit number assumptions).

13.6.6 In order to assess the likely employment created the two scenarios applied are those that would give rise to the highest employment rate and the lowest employment rate respectively. Each is a ‘best case’ in some respects but a ‘worst case’ in others. For example higher levels of commercial development (and more jobs) would mean less housing and thus less affordable housing. Lower levels of commercial development and more housing would result in less local employment and fewer indirect economic benefits.

13.6.7 The maximum residential scenarios may be considered as the ‘worst case’ in terms of impact on local facilities, as they would involve the greatest increase in the local population. On the other hand, the minimum residential scenarios may be considered as the ‘worst case’ in terms of meeting housing need and facilitating neighbourhood renewal, as they would result in the smallest increase in additional housing units.

13.6.8 In assessing the impact on community facilities, the socio-economic assessment identifies and assesses impacts initially assuming no additional provision. The assessment then considers how these judgements might be different with new or enhanced provision as part of the D1/D2 floorspace proposed. This second measure of impact is closely related to the measures described in the Further Mitigation section (12.8), which identifies some potential measures to address future needs arising from the King’s Cross Central development and to capture its full regeneration potential.

13.6.9 Explanations of the appropriate ‘worst case’ scenarios for air quality indicators, traffic and noise are provided in the relevant specialist reports/chapters.

13.7 Identification and Assessment of Effects

Introduction

13.7.1 This section assesses the effect of the development on the health of its residents and users and the surrounding population. Much of the assessment process stems from previous reports (Socio-economic, Air Quality, Transport and Noise), supplemented by additional health focused research.

13.7.2 Where relevant, both operational and construction effects have been considered. The baseline year of 2006/7 represents the projected completion of the CTRL embankment and new international station, and thus the Kings Cross Central construction phase would essentially represent a continuation of construction works in the area, albeit for a different purpose. It is important to note, though, that although the baseline is characterised by the CTRL construction works, the construction of the King’s Cross Central project would be significantly different in nature and approach. The King’s Cross Central project would involve works on smaller, parcels of land which would be released for use as the construction activity moves onto different areas. Furthermore, the completion of the CTRL embankment would mean that a large number of residential properties most affected by the CTRL construction, would effectively be shielded from the new (Kings Cross Central) development area by the embankment. This is likely to give rise to reductions in current levels of noise, vibration and other construction related impacts.
Assessment of Effects on Determinants of Health (Socio-economic factors)

13.7.3 This section includes assessments of each of the indicators, followed by a consideration of their cumulative effects. Conclusions are drawn from the Socio-economic Report and the health effects considered in relation to the influences discussed under each determinant heading in section 13.2.

Unemployment

Predicted Operational Effects

13.7.4 Detailed information regarding the effects of the development on unemployment is provided within the Socio-economic Report, in Part 12. In summary, once complete, the development would result in:

- direct job creation – It is estimated that total direct employment for the whole site completed development, would range from 22,287 to 26,485 full time equivalent jobs. Accounting for displacement (of some existing businesses) and multiplier effects a range of between 24,773 and 29,496 full time equivalent jobs would be created. Development without the Triangle Site would make a minor difference, reducing total numbers by between 56 and 167 jobs.

- increased local employment – Of the total jobs created for the completed development across the Whole Site, without specific positive interventions, between 7,432 and 8,849 jobs are likely to be taken by local residents in the Central and Wider Impact Zones. Development without the Triangle Site would make little difference (a reduction of between 17 and 50 jobs).

- opportunities for increased household income levels through the creation of a diversity of local employment opportunities from unskilled jobs to senior management allowing for entry level employment and upgrades

- the creation of employment opportunities close to home can have a dramatic impact on household livelihood, including saving on travel and care costs. They can also enable parents and carers with commitments at home to access work through travel time savings and flexible hours. The savings made by locally employed residents would directly increase the potential for local spend and household investment in improved social conditions.

Prediction of Construction Effects

13.7.5 For the construction phase, the Socio-economic Report (Part 12) predicts the total employment generated by the construction phase of King’s Cross Central, including the Triangle Site, would be 3,005 full time equivalent jobs across London. In terms of local employment, it is estimated that around 5% of the total workforce would be sourced from within the Central Impact Zone and 25% would be sourced from within the Wider Impact Zone. This gives rise to a total of around 902 local jobs across the whole site, falling to 872 without the Triangle site.

13.7.6 The nature of construction work means that employment generated and skills need would fluctuate over the development period. Nevertheless, the length of the King’s Cross Central construction period means that there is the potential for the construction sector to become a long-term stable employment base within the local economy. The sector includes a range of occupation levels, including traditional unskilled, semi-skilled and skilled labouring, but also engineering, management and support functions including
IT, personnel and others. The relatively high proportion of unskilled positions make it a good sector for low-skilled unemployed people to target.

13.7.7 Positive features such as use of larger contractors further influence the level of local employment achieved and opportunities for transfer of local trained labour, offset by the high accessibility of the site, relatively low existing construction skill levels and mobility of the construction workforce.

**Associated Health Effects**

13.7.8 The literature review on determinant/health linkages in Section 13.2 has shown unemployment to be associated with poor health outcomes, including issues relating to mental health, health-damaging behaviours as well as physical manifestations (including morbidity and premature mortality). Most of the evidence makes the link between unemployment and poor health, however it would also be expected that increased or higher paid employment would be associated with better health. Therefore, as the development offers employment opportunities, it could be expected that for those individuals that capitalise on the opportunities, better health outcomes would ensue.

13.7.9 It should be noted however, (as discussed in Section 13.2) that job satisfaction is important to realising health benefits of employment – poor quality employment can reverse the health improvements expected. In the context of this development the jobs that would be available are likely to require a range of skills, matching the employment demands and capacity of a broad spectrum of the local population.

13.7.10 However, measurements of changes in community health levels, are also dependent on a rise in the overall employment rate (and fall in the unemployment rate) resulting from people taking employment opportunities (within the development or elsewhere) and remaining to live within the area. Without this, the positive health effects of employment would be unlikely to result in significant positive effects across the local community as a whole, though of course individuals would benefit. The key to reversing this trend is stability – retaining the population who benefit from the opportunities presented by the development. The Socio-economic Report concludes:

“The local dominance of social housing tenures (see ‘Housing’ below) means that the local population would invariably continue to include a disproportionate number of people in most need of support, including unemployed, low wage earners and low income families. In addition, if current residents take advantage of higher wages or new employment opportunities and subsequently move out of social housing stock they are likely to be replaced by households in more need. As a result, it is unlikely that, without a restructuring of local housing markets, King’s Cross Central would dramatically reduce the local unemployment rate even though many individuals would benefit directly. A minor fall in unemployment is the most likely scenario, without wider structural changes (outside the control of the developer) and concerted positive action.”

**Assessment of Significance**

13.7.11 The Socio-economic Report (Part 12) has assessed the effect of the development on the determinant of ‘employment’ as follows:

- a Major Beneficial impact in terms of job creation;
- a Minor Adverse impact due to potential displacement of some existing businesses;
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- a Moderate Beneficial impact on local employment (with potential for enhancement);
- a Moderate Beneficial impact on local income levels;

13.7.12 All of these effects are relevant to health and the magnitude of the effect is expected to be comparable to the effect on the determinant. Therefore the predicted effect of the development on the health of individuals/communities is described in Table 13.8 below.

Table 13.8: Assessment of Operational Employment Effects on Health

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
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<tbody>
<tr>
<td>Job creation</td>
<td>Major Beneficial</td>
</tr>
<tr>
<td></td>
<td>Nature: Positive</td>
</tr>
<tr>
<td></td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td></td>
<td>Risk Of Occurrence: Likely</td>
</tr>
<tr>
<td>Displacement of existing businesses</td>
<td>Minor Adverse</td>
</tr>
<tr>
<td></td>
<td>Nature: Negative</td>
</tr>
<tr>
<td></td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td></td>
<td>Risk Of Occurrence: Likely</td>
</tr>
<tr>
<td>Local employment</td>
<td>Moderate Beneficial*</td>
</tr>
<tr>
<td></td>
<td>Nature: Positive</td>
</tr>
<tr>
<td></td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td></td>
<td>Risk Of Occurrence: Likely</td>
</tr>
<tr>
<td>Local income levels</td>
<td>Moderate Beneficial</td>
</tr>
<tr>
<td></td>
<td>Nature: Positive</td>
</tr>
<tr>
<td></td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td></td>
<td>Risk Of Occurrence: Likely</td>
</tr>
</tbody>
</table>

* with positive intervention this effect could be enhanced; see ‘Further Mitigation’ (Section 13.8) for details

13.7.13 In comparison with the operational phase, the employment offered during the construction period is generally less secure (due to the nature of the industry). As described in the literature review in Section 13.2 this may be a factor in preventing the benefits of employment transferring to beneficial health effects. However, as discussed above, the opportunity for continuation of employment experience from other schemes, alongside the long-term nature of the construction of the King’s Cross Central could counteract this. The Socio-economic Report (Part 12) has assessed the effect of the development on employment during the construction phase as Minor/Moderate Beneficial. The resulting effect on health however is predicted as Minor Beneficial (see Table 13.9 below); this is due to the fact that the construction phase generally offers less secure employment and therefore the opportunity for positive health effects is slightly reduced.

Table 13.9: Assessment of Construction Employment Effects on Health

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
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</thead>
<tbody>
<tr>
<td>Local employment</td>
<td>Minor Beneficial</td>
</tr>
<tr>
<td></td>
<td>Nature: Positive</td>
</tr>
<tr>
<td></td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td></td>
<td>Risk of Occurrence: Likely</td>
</tr>
</tbody>
</table>
**Effects without the Triangle Site**

13.7.14 The overall assessments of significance set out above would be the same without the Triangle Site development. This is because in relative terms the employment related socio-economic effects of the Triangle Site development are quite small.

**Ethnicity and Unemployment**

**Prediction of Operational and Construction Effects**

13.7.15 With regard to Black and Minority Ethnic groups and unemployment the following is relevant:

- Employment opportunities would be equal across all ethnic groups – the same pattern of ethnicity and employment as existing could be expected, without any positive interventions.
- Displacement issues would not fall disproportionately on any ethnic group.
- Some of the current local initiatives to promote employment prospects target Black and Minority Ethnic Groups to attempt to redress inequalities in employment for this section of the population.

**Associated Health Effects**

13.7.16 The literature review on determinant/health linkages in Section 13.2 has provided evidence of compounding negative effects of unemployment when racial discrimination is believed to be involved. Issues associated with ethnicity and health, however, go much further than associations with unemployment. It is difficult to untangle factors such as the standard determinants of health, cultural behaviours, genetic disposition and service use. This is complicated further by irregular recording of ethnicity in health data. Taking the Bangladeshi population as an example (as they are the dominant ethnic minority group in two of the three wards within the Central Impact Zone), at a London level they currently experience highest unemployment, lowest educational attainment at GCSE and highest overcrowding amongst all ethnic groups (data from Greater London Authority, 2002). Therefore, whilst focus on Black and Minority Ethnic groups with regard to employment opportunities would be a positive step and would have knock on effects on other determinants through increased income, this may not have a significant beneficial effect on the health of Black and Minority Ethnic communities.

**Assessment of significance**

13.7.17 With local initiatives already targeting Black and Minority Ethnic employment King’s Cross, Central would help reduce the disproportionate levels of unemployment currently displayed locally. The health effects of the development associated with this determinant are expected to be equivalent to those for unemployment in general (as shown in the table below), although the level of disadvantage currently experienced may mask this.
### Table 13.10: Assessment of Effects on Health Associated with Ethnicity and Unemployment

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
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</thead>
<tbody>
<tr>
<td>Job creation</td>
<td><strong>Major Beneficial</strong></td>
</tr>
<tr>
<td>Nature: Positive</td>
<td></td>
</tr>
<tr>
<td>Measurability: Qualitative</td>
<td></td>
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<tr>
<td>Risk Of Occurrence: Likely</td>
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<tr>
<td>Displacement of existing businesses</td>
<td><strong>Minor Adverse</strong></td>
</tr>
<tr>
<td>Nature: Negative</td>
<td></td>
</tr>
<tr>
<td>Measurability: Qualitative</td>
<td></td>
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<tr>
<td>Risk Of Occurrence: Likely</td>
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<tr>
<td>Local employment</td>
<td><strong>Moderate Beneficial</strong></td>
</tr>
<tr>
<td>Nature: Positive</td>
<td></td>
</tr>
<tr>
<td>Measurability: Qualitative</td>
<td></td>
</tr>
<tr>
<td>Risk Of Occurrence: Likely</td>
<td></td>
</tr>
<tr>
<td>Local income levels</td>
<td><strong>Moderate Beneficial</strong></td>
</tr>
<tr>
<td>Nature: Positive</td>
<td></td>
</tr>
<tr>
<td>Measurability: Qualitative</td>
<td></td>
</tr>
<tr>
<td>Risk Of Occurrence: Likely</td>
<td></td>
</tr>
<tr>
<td>Local employment during construction</td>
<td><strong>Minor Beneficial</strong></td>
</tr>
<tr>
<td>Nature: Positive</td>
<td></td>
</tr>
<tr>
<td>Measurability: Qualitative</td>
<td></td>
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<tr>
<td>Risk Of Occurrence: Likely</td>
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</tr>
</tbody>
</table>

* with positive intervention this effect could be enhanced; see ‘Further Mitigation’ (Section 13.8) for details

### Effects without the Triangle Site

**13.7.18** As described in the previous assessment, the overall significance set out above would be the same without the Triangle Site development.

#### Educational attainment

#### Prediction of Operational Effects

**13.7.19** Detailed information regarding the effects of the development on education is provided within the Socio-economic Report, in Part 12. In summary:

- the Main Site and Triangle Site would generate a child population of between 757 and 1,025. If the Main Site were developed alone this would reduce to between 667 and 936;

- the impacts on primary schools could range from between a surplus of 1 place to a deficit of 123 and for secondary schools between a deficit of 344 and 470;

- a combination of new leisure, community and employment facilities would have a beneficial impact on pupil and school performance locally. In addition, improved services and local facilities may encourage greater community stability and a reduction in population transience. This is a major factor affecting pupil performance and reduced incidence of pupils regularly moving schools would undoubtedly have a positive impact on performance;
targeted correctly, in combination with the Local Education Authorities and other service providers, the investment brought by King’s Cross Central could generate significant match funding for local education linked initiatives and encourage a greater prioritisation of King’s Cross for strategic education budgets.

**Associated Health Effects**

13.7.20 Educational attainment is inextricably linked to employment, income and housing opportunities and the health effects that are associated with them, as well as having its own direct proportional effect on psycho-social health. Overall, it is considered that investment, coupled with new opportunities for training and links with businesses, can create an environment to stimulate higher educational attainment (a trend that is already beginning) and increase the opportunities of the local population to seize employment and associated income gains and their subsequent improvements in health. As discussed above however, to transfer these benefits from individual to community level, stability is required.

**Assessment of Significance**

13.7.21 As described in the Socio-economic report (Part 12), whilst there is sufficient floor space available under the D1 land use in the planning application to accommodate new education provision, there is little justification for this based on a capacity assessment for the development alone. Instead the expansion/enhancement of existing schools or the improvements of routes to, and performance of, schools more able to accommodate new pupils could accommodate new demand created by King’s Cross Central. In the (unlikely) absence of new facilities or resources to address this lack of capacity the impact on local educational resources would be Moderate Adverse. The Further Mitigation section of Part 12 considers the measures that could be taken to address this impact.

13.7.22 By contrast the development proposals are likely to have a positive effect on the performance of local schools, some of which currently struggle to meet target standards. These positive effects would arise from a combination of new leisure, community and employment facilities, as identified in the bullet points above.

13.7.23 The impact of the development proposals on local educational performance is assessed within Part 12 to be Moderate Beneficial rising to Major Beneficial if the applicants' successfully develop some of the D1 floorspace for uses closely linked to schools and higher education.

13.7.24 The effects described for the determinant are considered to be comparable to the potential effects on health. Thus, the nature and significance of the effect of the development on health associated with this determinant can be summarised as follows:
Table 13.11: Assessment of Operational and Construction Educational Attainment Effects on Health

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects on School Capacity</td>
<td>Moderate Adverse (new facilities or resources to accommodate new demands created by King’s Cross Central would address these effects; see below)</td>
</tr>
<tr>
<td>Nature: Negative</td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td>Effects on Educational Performance</td>
<td>Moderate Beneficial (with potential to rise if the proposals deliver new high quality higher education and other education links and facilities; see below)</td>
</tr>
<tr>
<td>Nature: Positive</td>
<td>Measurability: Qualitative</td>
</tr>
</tbody>
</table>

13.7.25 If the proposals deliver new high quality higher education and other education links and facilities, the overall significance of the effect on health through educational attainment could rise to **Major Beneficial, Positive, Qualitative and Likely**.

**Effects without the Triangle**

13.7.26 Given the small number of family sized units (and thus child population) envisaged on the Triangle site, the assessment of significance set out above would not change significantly should the Triangle Site not go ahead.

*Proportion of homes judged unfit to live in*

**Prediction of Operational Effects**

13.7.27 Detailed information regarding the effects of the development on housing is provided within the Socio-economic Report, in Part 12. In summary the operational phase of the development would result in:

- Direct provision of between 1,600 and 2,300 new homes on the Main Site (with up to an additional 250 on the triangle site).

The above provision would obviously be of a good modern standard, thereby avoiding the negative health effects associated with poor quality housing described in the determinant/health linkages literature review in Section 13.2. However, the King’s Cross development would be large enough to act as a catalyst for the creation of an intermediate market in its own right and:

- a rebalanced tenure profile within the Central Impact Zone by introducing a significant mix of market and affordable/low-cost housing in an area currently dominated by social rented property;
- creation of a local ‘ladder’ of housing choice;
- help stabilise transience in the local population;
- introduce a new fluidity that could stimulate the local (and wider) housing market as a whole;
- rebalancing of local communities;
• encouragement of investment in existing housing stock in need of refurbishment/replacement.

13.7.28 The effects on housing quality would be positive, with provision of new affordable accommodation, alongside a stimulation of the local housing market encouraging regeneration of existing stock, and increased choice for those currently facing unacceptable housing conditions.

13.7.29 The issue of gentrification – the process whereby regeneration changes an area to such a degree that it ‘prices out’ local residents – has been extensively discussed in the Socio-economic Report (Part 12). In summary, the unique socio-economic structure of the Kings Cross locality, where it is dominated by the social housing sector, considerably limits the potential for adverse effects.

**Prediction of Construction Effects**

13.7.30 No effects are expected during the construction phase for this determinant.

**Associated Health Effects**

13.7.31 The literature review in Section 13.2 has shown a wide range of negative health effects associated with poor quality housing and living conditions. New homes constructed as part of the development would be of a modern, high quality and therefore would not be expected to be associated with the many negative health issues described. There are also indirect beneficial effects, including the stimulating of re-investment in existing housing stock thereby improving living conditions for existing residents. Studies reported in Cave et al. (2001) attribute improvements in mental health (such as anxiety, depression, self esteem etc) and reduced fear of crime to housing refurbishment, although links to physical health improvement are less robust (sometimes merely halting deterioration) and partial refurbishment is reported to produce poor results.

**Assessment of Significance**

13.7.32 Positive effects in terms of housing quality would be accrued by those living in the new units and existing residents who benefit from an opportunity to move or change tenure. The proposals provide scope for a significant net increase in affordable/low-cost housing in the area, catering for identified housing needs of low income groups with wider, structural effects. Part 12 concludes that this provision is of Minor to Moderate Beneficial significance, depending upon the level of affordable housing and tenure profile. Based on the information available, it can be expected that benefits accrued from improvements in housing quality are comparable to the effects on housing provision predicted in Part 12 (and described above).

13.7.33 For the wider housing effects, Part 12 assess the development as instigating positive effects of Moderate to Major Beneficial significance, depending on the final housing numbers tenure mix. Thus the significance of housing related effects on health are summarised in Table 13.12 below.
Table 13.12: Assessment of Operational Housing Effects on Health

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
<th>MEASURABILITY</th>
<th>RISK OF OCCURRENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct provision of new, good quality housing</td>
<td>Minor to Moderate Beneficial</td>
<td>Nature: Positive</td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td>Creation of housing ladder and other, wider indirect benefits</td>
<td>Moderate to Major Beneficial</td>
<td>Nature: Positive</td>
<td>Measurability: Qualitative</td>
</tr>
</tbody>
</table>

Effects without the Triangle Site

13.7.34 With only 250 of the potential 2,550 new homes being proposed on the Triangle Site the assessments of significance set out above would not change with development of the Main Site only. This is because, in relative terms, the housing related socio-economic effects of the Triangle Site development are a small part of what has been assessed.

Crime

Predicted Operational Effects

13.7.35 The effects of the development on crime are discussed in the Socio-economic Report, in Part 12. Effects are difficult to predict due to the fact that they are largely indirect and that crime patterns are governed by complex interactions between supply, demand and environment. However, the Socio-economic Report states:

“Improving the attractiveness of public spaces serves to encourage increased levels of use, especially where new spaces are furnished with facilities such as cafes or concert spaces. This fosters a level of vitality in the area, which in turn, encourages more people to visit, turning the ‘space’ into a ‘place’. This increased vitality in regenerated areas encourages stewardship, vigilance, better maintenance and reduced crime and anti-social behaviour.”

13.7.36 Kings’ Cross Central would represent a dramatic change to the local environment and the removal of some ‘hotspots’ for criminal activity. The creation of new active frontages onto the Canal and routes out of the site would also increase overlooking and vitality to help ensure people feel safe and encourage use. In addition, with the levels of management referred to in the Regeneration Strategy and other documents supporting the planning application, King’s Cross Central is likely to reduce demands on the police allowing more efficient policing of areas outside its boundary. The Metropolitan Police are currently actively encouraging the Councils and other local land owners to review and remove physical opportunities for criminal activity in nearby estates and commercial areas. If undertaken in parallel with King’s Cross Central, this is likely to result in a net decrease in criminal activity across the Central Impact Zone as whole.

13.7.37 The effect of enhancing the King’s Cross Central environment, in combination with the other developments in the area is likely, therefore, to reduce overall crime levels in the area as a whole as the opportunities for criminal activity (vacant premises, unoccupied streets and obscure hiding places) are removed and the image of the area is lifted. Drug and prostitution related crime may be displaced but there is little evidence to show that it is more likely to occur elsewhere in the area than somewhere else in London.
13.7.38 Any displacement of criminal activities outside the site boundaries is likely to be sporadic and isolated to opportunity areas. It is unlikely to affect the Central or Wider Impact Areas as a whole. In addition the improved image (from the current negative perceptions of crime in the area) created by the development itself is likely to ensure the fear of crime potentially derived from these isolated occurrences is outweighed by positive perception changes across the area as whole.

**Predicted Construction Effects**

13.7.39 The Socio-economic Report considers the relationship between construction activity and crime. Given the dynamic nature of the environments with the Kings Cross Central locality and the current presence of construction activity in the area, it is unlikely that the construction phase would generate a perceptible change in overall crime levels of the area. Very little criminal activity takes place on the site at present.

**Associated Health Effects**

13.7.40 Apart from the obvious potential physical effects arising from violent crime, all crime, as well as the fear of it, has been linked to negative psychological effects (see Section 13.2 for further details).

**Assessment of significance**

13.7.41 Part 12 concludes that King’s Cross is likely to have Major Beneficial effects on crime levels, the fear of crime and perceptions of the wider King’s Cross area.

13.7.42 It is considered that the potential for positive health effects will be of a comparable magnitude, as presented in the table below.

**Table 13.13: Assessment of Operational Crime Effects on Health**

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in crime/fear of crime and enhanced perceptions of King’s Cross</td>
<td><strong>Major Beneficial</strong></td>
</tr>
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</table>

13.7.43 With regard to the construction phase, in the context of the 2006/7 baseline situation, when CTRL construction works are coming to an end, the effect of the Kings Cross Central works could be considered to be, at worst, negligible. However, the phasing of the works and subsequent release of accessibility through separate areas of the site would improve connectivity and safety, and thus positive effects could be seen, as laid out in the table below.
Table 13.14: Assessment of Construction Crime Effects on Health

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in crime/fear of crime</td>
<td>Minor Beneficial</td>
</tr>
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</table>

Effects without the Triangle Site

13.7.44 The assessment of significance set out above would continue to apply for development of the Main Site only. This is because in relative terms the socio-economic issues raised by the Triangle Site in relation to crime are limited.

Social Capital

Predicted Operational Effects

13.7.45 Detailed information regarding the effects of the completed development on social capital is provided within the Socio-economic Report, in Part 12. In summary the operational phase of the development would result in:

- physically linking two currently divided communities and offering opportunities for greater interaction, increased collective and individual income and a focal point for work, socialising and entertainment
- up to 75,765 m² of community, health, education and cultural uses within use class D1 on the Main Site; this could include library facilities, community centre facilities, youth facilities, day nursery facilities, primary school provision, higher education provision, visitor/tourist information centre, industrial heritage and other museums, art galleries/visual arts centre/exhibition space, enhanced facilities for boat users;
- an additional 3,500m² of floorspace for D1 and D2 uses on the Triangle Site to include a health and fitness centre, a medi-centre and crèche facility; and
- public realm provision and improved access/connectivity for existing open space/public realm areas, with additional local amenity/play space within individual development zones.

13.7.46 The Socio-economic Report states:

“King’s Cross Central could offer facilities that provide important elements in developing stronger social capital, across existing community boundaries. The proposals present a permeable form of development, open to the public, without the gates and barriers that have characterised some major schemes in the 1990s. Neighbouring residents would be able to take full advantage of new services and facilities, shops and employment…In that context, new meeting places and focal points for communal activities (such as concerts, sports, museums, learning and attractions), within the development or investment in neighbouring places in Camden or Islington, open to new and existing residents, could encourage new relationships and increased integration. Local employment in King’s Cross Central and a range of public facilities may also foster greater pride in the development as a focal point for communities. The space dedicated to D1 and D2 uses in the Planning
Applications could accommodate a wide range of community uses that would contribute to building social capital.”

**Predicted Construction Effects**

13.7.47 The construction phase of the development, running subsequent to long-standing construction activities in the area, is being progressed in a status quo of poor connectivity and community involvement. The King’s Cross Central construction would have potential positive effects through (i) the beginning of long awaited development and removal of blight ii) the phased release of the site, progressively introducing the public realm and community facilities described above, bringing about continual improvements in connectivity, and (iii) community involvement, focus and awareness measures and accessibility of information with regard to the construction works.

13.7.48 Additional indirect effects arising from increases in the physical facilities described under this heading are those associated with the promotion and availability of exercise opportunities. This may be through the use of new D1/D2 facilities, use of open space for formal or informal recreational activities, or increased use of the developments pedestrian and cycleway connections encouraging more active means of transport as part of the daily routine.

**Associated Health Effects**

13.7.49 Despite the mixed evidence concerning links between social capital and health effects it is likely that a range of social and community activities and facilities proposed in the development would have positive health effects, be it directly through social capital, or indirectly through reinforcement of positive effects on other determinants of health (such as crime and education). If effects on individual health as a result of increased social capital are not perceptible, community level effects, including population stability, are more likely.

13.7.50 The level of community involvement in the development process is an additional contextual element to increased social capital. So far, the scheme development and planning stages have included extensive community consultation measures, to familiarise the community with the proposals and offer opportunities for comment. One of the overriding messages arising during the community consultation process undertaken for this scheme (commissioned by the applicant, and undertaken with the assistance of Fluid Design) was that the removal of uncertainty regarding the use and development of the site was a positive thing.

**Assessment of Significance**

13.7.51 Overall, the Part 12 report concludes that the mix and range of community and leisure facilities offered in King’s Cross Central are likely to have a Major Beneficial Impact on the social capital of communities in the Central and Wider Impact Zones. The uses proposed would add a choice of activities and opportunities never before available to many members of neighbouring deprived communities.

13.7.52 Moreover, by focussing on development of the right facilities King’s Cross Central could make a major contribution to the improvement of local community resources. This issue is discussed in the Further Mitigation section.
The effect of increased exercise opportunities has been assessed in this chapter using the population-based method described in Section 13.2. For this particular issue, the population affected would be limited to those with a pre-disposition to take up leisure/exercise opportunities; however, whilst the effect can only be assessed as being of minor significance, it is certainly beneficial. This is also presented in the table below.

**Table 13.15: Assessment of Operational Social Capital Effects on Health**

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact on social capital through mix and range of community and leisure facilities</td>
<td>Major Beneficial</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in exercise opportunities</td>
<td>Minor Beneficial</td>
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</table>

For the construction phase, the significance of effects associated with this determinant is presented in the table below.

**Table 13.16: Assessment of Construction Social Capital Effects on Health**

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progressive increase in social capital</td>
<td>Minor Beneficial</td>
</tr>
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<td></td>
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</tbody>
</table>

**Effects without the Triangle Site**

The assessments of significance set out above would continue to apply to development of the Main Site only. This is because in relative terms the socio-economic effects of the Triangle Site development on community facilities and social capital are relatively small, albeit the proposals make provision for specific D1/D2 uses. The Main Site proposals include substantial levels of D1/D2 floorspace in any event.

**Summary and Cumulative Effect on Socio-economic Determinants of Health**

In the context of the Merseyside Guidelines for Health Impact Assessment (Scott-Samuel et al., 2001) approach, the preceding assessments are mostly assessed as positive, qualitative and likely. The reason for this is four fold:

- The development would bring about beneficial effects with regard to the determinants of health considered – as an association has been made between poor performance of these determinants and poor health, it is considered that improvements in the determinants is likely to lead to improvements in health.
For this type of assessment, quantitative predictions of disease prevalence are not possible – it is not an epidemiological study.

Each individual determinant has the potential to influence health; however, the range of contributory factors to health and well-being ensure that effects on individual determinants can only be assessed in terms of likely outcomes – not definite outcomes.

Whilst opportunities can be created, and take-up can be encouraged, it is essentially each individual’s responsibility to embrace what is on offer and realise the potential.

In considering cumulative effects, inducement of a housing ladder within the local communities would encourage the establishment of a stable residential community within the area. This would have direct positive effects on factors such as social capital but, more importantly, would encourage the maintenance of health gains deriving from other socio-economic features to remain with the resident population. Without this, the dominance of social housing in the area means that those benefiting from employment and other opportunities within the area may not have the opportunity to stay and invest in the community/social capital. A graduated housing ladder with mixed tenure is seen as an important element in achieving sustainable urban renewal and maximising the potential health gain of the community. Investment in other public services would promote the attractiveness of local facilities and prevent outward migration from the area.

Therefore, assessing the cumulative impact of the proposals on the socio-economic related indicators, the development is likely to have **positive (beneficial)** health effects on an individual and wider community basis. This predicted positive effect can be further classified as **qualitative** and **highly likely**.

As stated in the Socio-economic Report (Part 12) the sphere of influence of the developer is limited in comparison with the range of issues present within the local communities which may promote or prevent uptake of opportunities associated with the socio-economic determinants of health. Therefore the leadership and active involvement of the Local Authorities, health services, police and other service providers would be important in optimising the potential benefits on offer.

**Assessment of Effects on Determinants of Health (Physical environment factors)**

**Air Quality Indicators**

Detailed assessment of the potential effects on the air quality indicators within the site and its vicinity has been made in the Air Quality and Climate Change Specialist Report (Part 18); summary details are provided below.

**Predicted Operational Effects**

During the operational phase, as a result of the development

- Modelling results indicate that the development traffic would lead to a less than 1% increase in concentrations of nitrogen dioxide and particulate matter (PM$_{10}$) at selected (worst case) receptors located within and adjacent to the site;
Additional traffic generated by the scheme would increase total emissions of nitrogen oxides, particulate matter and carbon dioxide in the study area by 0.6% or less.

Heating emissions from the development would lead to a very small (<4%) change in nitrogen dioxide emissions in the area and a very small (<7%) increase in carbon dioxide emissions. However, carbon dioxide is a global pollutant, which does not have any direct local effects.

Considering both heating plant and traffic sources together, the total increase in emissions arising from the development would be very small compared to existing emissions in the study area.

The potential for dust impacts from the concrete batching plant (which does not form part of King's Cross Central) affecting site occupants is considered to be negligible.

**Predicted Construction Effects**

**13.7.62** During the construction phase:

- Considering a worst case scenario (see Air Quality and Climate Report, Part 18, for details) there is the potential for dust effects to be experienced – this includes increased soiling up to 100m from a dust source, and potentially significant increases in particulate matter (PM$_{10}$) concentrations up to 50m from a dust source.

- On this basis, around 150 residential properties in York Way, Rufford Street and Gifford Street, residents of houseboats on the Regent Canal and residents of some of the new affordable housing units being built on the playground site at the junction of Rufford Street and Gifford Street could be at risk of dust soiling effects at some point during the construction period.

- Occupiers of some business premises on York Way and the Agar Grove Industrial Estate and parked cars and heritage buildings in the area may also experience dust soiling.

- Around 30 of the properties on York Way at risk of experiencing dust impacts may also be at risk of PM$_{10}$ impacts, as may residents of the houseboats on the Regent Canal.

- Dwellings or premises built as part of the new development, occupied whilst construction work within these distances is ongoing, may also suffer some occasional impacts. If the proposed King's Place development to the east of York Way is completed before the construction of Blocks F and J, then occupiers of these premises could also be at risk of dust soiling effects during the construction of these blocks. Visitors to the site could also be temporarily affected by these impacts.

- Any dust incidents would be highly dependent on the weather, requiring dry conditions and winds blowing towards a receptor.

**13.7.63** The potential for construction workers to be adversely affected by contaminated dust has been addressed fully in the Soils and Contamination Specialist Report (Part 16) and in Chapter 4 (Construction) of the main body of the Environmental Statement. Given the measures to be employed, the risk of effects upon the health of workers, visitors and occupiers of this site and of adjacent sites from contaminated dusts is assessed as
negligible. Where parts of the site have been identified as potentially contaminated, the necessary precautions would be specified for dust control, spoil removal and disposal.

Assessment of significance

13.7.64 The significance of the changes in air quality indicators has been assessed according to the assessment criteria established within the Air Quality and Climate Change Specialist Report (Part 18). The resultant effect on health has been considered as analogous in magnitude to the effect on the indicator and is presented in Table 13.17 below for the operational phase and in Table 13.18 for the construction phase.

13.7.65 For the operational phase, although the predicted changes in concentrations of pollutants due to additional traffic and heating plant sources are very small, they are within an area where concentrations are expected to be above the objectives (within an Air Quality Management Area). Therefore, in accordance with the criteria, the impact is determined to be minor adverse. Given that this significance reflects primarily high background concentrations, as opposed to any material change resulting from the development, the assessment that the ‘risk of occurrence’ of such an effect on health is ‘likely’, could be considered worst-case. This is presented in the table below.

**Table 13.17: Assessment of Operational Effects on Health Associated with Air Quality Indicators**

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts on air quality indicator concentrations due to operational traffic</td>
<td>Minor Adverse</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts on air quality indicator concentrations due to heating plant</td>
<td>Minor Adverse</td>
</tr>
<tr>
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</tbody>
</table>

13.7.66 The impact on air quality indicators from construction activities would be moderate adverse (para 18.7.7). The ‘moderate’ significance judgement arises from the nature and length of construction operations, which automatically produce a moderate ranking. That said, the measures outlined in Section 18.6 represent best practice in terms of construction management.

13.7.67 The increase in nitrogen dioxide and PM10 concentrations due to construction traffic associated with the King’s Cross Central development would be very small (<1%). However, as these increases are predicted within an AQMA, the significance of construction traffic would be minor adverse.

13.7.68 The ‘risk of occurrence’ of construction traffic effects on health has been assessed as ‘likely’ (as above). This is presented in the table below.
Table 13.18: Assessment of Construction Effects on Health Associated with Air Quality Indicators

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in air quality indicator concentrations – construction operations</td>
<td><strong>Moderate Adverse</strong> <em>(see para 13.7.65)</em></td>
</tr>
<tr>
<td></td>
<td>Nature: Negative</td>
</tr>
<tr>
<td></td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td></td>
<td>Risk of Occurrence: Highly likely</td>
</tr>
<tr>
<td>Construction traffic effects</td>
<td><strong>Minor Adverse</strong></td>
</tr>
<tr>
<td></td>
<td>Nature: Negative</td>
</tr>
<tr>
<td></td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td></td>
<td>Risk of Occurrence: Likely</td>
</tr>
</tbody>
</table>

**Effects without the Triangle Site**

13.7.69 If the Triangle Site development were not to go ahead, then the operational impact on local traffic flows would be slightly smaller. The already very small increase in predicted pollutant concentrations would therefore be reduced, however, the overall significance of impact would remain classified as minor adverse, as the very small increase would occur within an AQMA.

13.7.70 Similarly, if the proposals for the Main site were to go ahead without the Triangle Site, then the number of properties likely to be affected by construction impacts would be smaller. Without the Triangle Site development, the impact of construction activities on dust-soiling and PM$_{10}$ concentrations would remain moderate adverse, however, properties in Ruff Street and Gifford Street would be unlikely to be affected by the construction works. The significance of impacts on nitrogen dioxide and PM$_{10}$ concentrations due to construction traffic would be slightly less than that with the full King’s Cross Central proposals but it would remain classified as minor adverse due to the site position within an AQMA.

**Road Traffic Accidents**

**Predicted Operational Effects**

13.7.71 No quantitative predictions of possible changes to the road traffic accident rate of the area have been made. However, information regarding the effects of the development on road traffic in general is provided within the Transport section of the Environmental Statement (Part 5.3) and this has been used to gain an understanding of the road traffic environment to be created, with qualitative comments made on likely implications for road traffic accidents. In summary the development would result in:

- Additional trips on the highway network could peak at around 600 two-way vehicles in the morning and evening peaks. In percentage terms the increase in traffic on local roads during the morning and evening peaks is estimated to range from −4.6% to +11.1%, with a less than 5% increase occurring on most routes.
- High quality, safe pedestrian connections would be provided within the site and in surrounding areas.
- For primary routes (main circulation corridors) within the site, design would incorporate measures to reduce vehicle speeds and achieve a high level of road safety and incorporate provision for controlled pedestrian crossings where required.
For secondary routes (distributor roads) within the site, design would incorporate measures to reduce vehicle speeds and emphasise the needs of pedestrians, cyclists and buses.

For tertiary routes (local accesses) within the site, design would incorporate measures to ensure pedestrian priority and very low vehicle speeds (e.g. ‘Home Zone’ style of treatment) whilst ensuring permeability for buses and emergency vehicles where necessary.

The conditions associated with high prevalence of accidents are volume, speed and parking arrangements. Whilst additional traffic is likely to be generated by the development, the parking regime, pedestrian routes, traffic calming measures and areas of pedestrian priority are likely to counteract any potentially negative effects arising with regard to pedestrian safety. In accordance with the proposals described above, a World Health Organisation/World Bank (2004) report states that ‘a road network planned for safety has a hierarchy of roads with several levels of classification of road, each intended to serve a certain function’.

The development would provide such a hierarchy of new, safe routes (and junctions) with appropriate priority afforded to pedestrians and cyclists. The development is therefore likely to result in a positive impact on road traffic accidents (i.e. reduce accidents).

Predicted Construction Effects

The Construction section (Part 4), provides an indication of likely traffic volumes and routes through the construction phase. As for the operational effects, no quantitative prediction of effects on road traffic accident rates during the construction phase has been possible.

It is expected that construction materials traffic would be restricted to the strategic road network, minimising any potential impact on local residential roads where clashes with pedestrian activity is a greater risk. Good site access management would be important to ensure that pedestrians are not put at risk at site entry and egress points. This would form part of the Construction Method Statements to be prepared prior to works commencing. Construction vehicles, their speed and parking arrangements would be controlled for to remove accident risk factors from the vicinity of the site. Furthermore, given the phased nature of the works, this period would see gradual improvements in connectivity and the quality/safety of thoroughfares.

Comments on the Draft Scope for the Kings Cross Central EIA, prepared on behalf of Camden PCT (Ison, 2003c) referred to the potential for impact on public access and public transport services resulting in ‘discomfort, difficulty and inconvenience to vulnerable groups in the population’.

Where practicable, existing public access routes and rights of way would be maintained and properly signposted during construction. Where this is not possible the following measures have been identified to minimise disturbance:

- Suitable alternative routing would be provided and would be signposted, and the alternative route would be illustrated on maps displayed at appropriate locations.
- All alterations to routes would be notified in advance with suitable signage.
- The Contractor would be required to ensure that public notices are issued to provide information on the dates and duration of any closure of routes. These would
be appropriately distributed and would display the Helpline telephone number and web address of the development as well as a plan showing the alternative route.

13.7.78 Some temporary diversion of bus routes would be necessary and some disruption would therefore arise. Where this is necessary, the same approach as described above would be adopted, minimising the disruption to users of public transport. It is therefore predicted that the significance of this effect would be minor adverse due to its temporary nature, and the management measures that would be employed.

Assessment of Significance

13.7.79 During the operational phase, the location of the site, mix of uses within it and surrounding it and the high density of residential development within the locality means that a relatively large number of people could be traversing the site on a daily basis. Whilst the development is likely to increase the number of people moving about in the area, the opportunity for appropriate design of pedestrian and highway routes is expected to result in a net positive effect, as described below.

Table 13.19: Assessment of Operational Road Traffic Accident Effects on Health

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential for reduction in Road Traffic Accident rate</td>
<td>Moderate Beneficial</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13.7.80 The construction phase effects, described above are summarised in the table below.

Table 13.20: Assessment of Construction Road Traffic Accident Effects on Health

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction traffic affecting Road Traffic Accident Rate</td>
<td>Negligible</td>
</tr>
<tr>
<td>Gradual improvements in thoroughfares</td>
<td>Minor Beneficial</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Disruption to pedestrian/public transport routes</td>
<td>Minor Adverse</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Effects without the Triangle Site

13.7.81 The progression of the development without the Triangle Site is predicted to have negligible effects on the assessments of traffic volumes and regimes within the site (as predicted in Part 5.3) and therefore, alongside the fact that it forms a relatively small part of the overall development, no significant change in the assessment of health associated with road traffic accidents would be expected.

Noise

13.7.82 Detailed assessment of the potential effects on the noise and vibration climate of the site and its vicinity has been made in the Noise and Vibration Specialist Report (Part 17); summary details are provided below

Predicted Operational Effects

13.7.83 During the operational phase, as a result of the development:

- the changes in road traffic noise level along any of the roads in the vicinity of the site, due to the operation of the King’s Cross Central development, would be 0.7 dB or less. These changes in noise would not be perceptible

- New plant and machinery on/within King’s Cross Central buildings would be another noise source. Generally, all new plant and machinery installed on any building would be specified to ensure that the noise created at the façade of the nearest noise sensitive building by this plant/machinery would be at least 5 dB less than the background noise, in the absence of construction noise. Alternatively, where the noise sensitive building is a King’s Cross Central building, the same level of protection for building occupants could be achieved through the detailed design of the building envelope/façade.

- There would be no sources of vibration within the development that would cause perceptible levels of vibration beyond the site boundary.

- it is not anticipated that the operation of the development would cause any significant change in vibration from road traffic at properties in the area.

- The detailed design process and normal planning controls provide the means, therefore, to ensure that the design and external appearance of buildings is appropriate and that mitigation measures (for example vibration isolation at the foundations of buildings and the stiffening of floor spans) are incorporated, as necessary.

Predicted Construction Effects

13.7.84 During the construction phase, noise and vibration would be generated by demolition and construction activities on site and by construction related traffic off site, and could potentially affect nearby sensitive locations. However, all contractors would be required to adopt best practical means to minimise noise and vibration. The assessment in Part 13 also reports:

- Where necessary, relatively quiet demolition methods would be used (such as large scale excavators using bucket and shear jaw attachments)
Piling is the only construction process likely to be used that could cause high noise levels at locations outside of the site. Percussive piling would generally be avoided, but may occur under the worst case. Where there is no alternative to percussive piling, all practical means would be employed to reduce noise. Some piling may need to be carried out at night.

The increases in road traffic noise due to construction traffic would be generally small, with all of the increases on roads with residential properties being 1.6 dB or less. These increases would not be perceptible. An increase of slightly more than 3 dB is predicted on Goods Way and while there are no permanent noise sensitive receptors on this road there are residential narrowboat moorings on the Regent’s Canal close to Goods Way.

Construction traffic would travel on the highway network beyond the roads, but is likely to remain on major roads and would be dissipated with distance from the site.

**Assessment of Significance**

13.7.85 The detailed assessment undertaken in the Noise and Vibration Specialist Report (Part 17) concludes that the impact of augered piling would be negligible during daytime hours, but could cause a moderate adverse effect at night when working to the east of the tunnels. Working to the west of the tunnels is likely to result in noise levels below the night-time baseline traffic noise and the impact would therefore be negligible.

13.7.86 Percussive piling alongside the tunnels would cause a moderate adverse effect at night. There would also be a minor to moderate adverse impact during the daytime.

13.7.87 The impact of construction noise from other activities would be of negligible significance.

13.7.88 The predicted increase in traffic noise levels is considered to be a minor adverse effect at the narrowboats along Goods Way.

13.7.89 For this determinant the effects on health are assessed as being of comparable magnitude as the effects on the determinant, as presented in Table 13.21 below.

### Table 13.21 Assessment of Construction Noise and Vibration Effects on Health

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise effects from piling operations (assuming worst case scenario)</td>
<td><strong>Moderate Adverse</strong></td>
</tr>
<tr>
<td></td>
<td>Nature: Negative</td>
</tr>
<tr>
<td></td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td></td>
<td>Risk of Occurrence: Highly likely</td>
</tr>
<tr>
<td>Construction traffic effects</td>
<td><strong>Minor Adverse (along Goods Way)</strong></td>
</tr>
<tr>
<td></td>
<td>Nature: Negative</td>
</tr>
<tr>
<td></td>
<td>Measurability: Qualitative</td>
</tr>
<tr>
<td></td>
<td>Risk of Occurrence: Highly likely</td>
</tr>
<tr>
<td>Noise effects from other activities</td>
<td><strong>Negligible</strong></td>
</tr>
<tr>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>
**Effects without the Triangle Site**

13.7.90 If the Main Site were developed alone without the Triangle, there would be a reduction in traffic noise of 0.1 dB on some roads compared with the situation with the whole development. The maximum increase in traffic noise would not exceed 0.7 dB. These changes in noise would not be perceptible and are considered to be of negligible significance.

13.7.91 During construction of the Main Site and the Triangle Site road traffic noise is calculated to increase by up to 1.6 dB on some roads with residential properties. If the Triangle Site were not developed these increases in road traffic noise would be marginally smaller. The difference would be imperceptible.

**Assessment of Effects on Health Services**

*Predicted Operational Effects*

13.7.92 In considering the impact on health care facilities the assessment closely follows the approach adopted in the Socio-economic Report: The D1 and D2 floorspace applied for (110,815 square metres across the Main Site and Triangle Site) could readily accommodate a full range of new community and health facilities. However, the use of this space for such facilities may not necessarily be the most efficient way to create and deliver new or enhanced services, as recognised in the Joint Planning and Development Brief at paragraphs 2.10.8, 2.11.5 and 2.12.4.

13.7.93 Consequently, though it is clear that the applicants envisage accommodating some new health provision within King's Cross Central, there is no detail at this stage and no specific commitments about particular new or enhanced facilities. The Main Site Development Specification paras 3.25 – 3.29 identifies the types of facilities that could be provided on the Main Site and para 6.15 states that thresholds for the phased delivery of health and other uses would be agreed with the LPA when outline permission is granted. Thereafter the level, mix, timing and delivery of new provision would be matters for agreement, as plans come forward for each major phase (para 3.26).

13.7.94 The Triangle Site application does refer specifically to new medi-centre facilities, but at this stage the applicants have in effect designed a flexible 'box', up to 3,500 square metres in floorspace, within which various uses and facilities could be provided, to be determined later. The size and nature of the medi-centre provision is not specified, at this stage.

13.7.95 The sense in this flexible approach is self-evident. It means that the applicants, local authorities and other service providers would have scope to decide later on the precise form of new provision within the Main Site, in particular, armed with the best information at the time. Nevertheless, it makes an assessment difficult. The applicants' have set out a number of more specific intentions and aspirations within a submitted Implementation Strategy and indeed a Regeneration Strategy, however these are very much supporting documents and intentions and aspirations do not necessarily form the basis for a robust EIA.

13.7.96 As a result, the assessment identifies and assesses impacts initially assuming no additional health provision. The assessment then considers how these judgements might be different with new or enhanced health provision as part of the D1 floorspace proposed. This second measure of impact is closely related to the measures described in the Further Mitigation section (12.8), which identifies some potential measures to address future...
needs arising from the King’s Cross Central development and to capture its full regeneration potential.

13.7.97 The principal effect of the development on health care services would be the introduction of a new residential and working population to the area requiring local health care provision. The size of these populations has been estimated in the Socio-economic Report (Part 12) as:

- the housing proposed in the Planning Applications would introduce a population of between 3,338 and 4,678 people on the Main Site rising to between 3,785 and 5,125 people if the Triangle site is developed.
- it is estimated that total direct employment for the whole site development (completed development), would range from 22,287 to 26,485 full time equivalent jobs. Accounting for displacement and multiplier effects a range of between 24,773 and 29,496 full time equivalent jobs could be created.

13.7.98 The investigations undertaken into services and capacity indicates that the health services within the area are currently operating beyond capacity as indicated by the number of people per GP far exceeding the national average, and the poor performance of Camden and Islington PCT in the National Patient Survey.

13.7.99 In this context, in the absence of new facilities or resources to address the (principally GP) needs arising from King’s Cross Central, there would be adverse effects of moderate significance, given the size of the population potentially affected.

13.7.100 This scenario is considered unlikely, given that:

- “primary health care and support facilities” are listed at para 13.27 of the Main Site Development Specification as one of the types of facilities that could be provided;
- Para 6.15 of the same document refers to agreeing thresholds for the phased delivery of health and other uses;
- The Triangle Site application makes specific referenced to new medi-centre facilities.

13.7.101 The new population of up to 5,125 people would require up to 3 GPs on the basis of the national average, or up to 4 GPs on the basis of the aspirational target of 1 GP per 1,500 people (from Fahey and Ison, pers comm.). To put this in context, recent experience of new primary care facilities in London suggests that a facility of 1,000 sq.m could accommodate a 4 GP practice together with other ancillary services.

13.7.102 Thus, the proposed development could readily accommodate appropriate new provision, with the floorspace applied for, to meet the needs arising from the development. Any new provision could be on the Triangle Site and/or the Main Site.

13.7.103 The accommodation and provision of new facilities or improvement of existing facilities to meet the new demands arising from the development would counteract the ‘moderate adverse’ effect identified above and produce some benefits for the neighbouring population. Indeed, any new/enhanced facility is likely to reduce the current level of undersupply for existing residents.

13.7.104 The development would bring other positive effects on health service provision. Firstly, the additional connectivity through the site linking two currently divided communities allows for efficiencies in existing service provision through consolidation and rationalisation. Secondly, the regeneration activities in the area are likely to improve conditions (such as safety, housing etc) that would attract and help with retention of staff.
– this is currently a major issue within the area, where vacancy rates for health professionals are well above the England averages.

**Predicted Construction Effects**

13.7.105 During the construction phase, given the fact that primary care services are provided on a residential location basis rather than an employment location basis, the influx of construction workers onto the site is unlikely to result in a significant effect on the demand placed on primary care facilities in the area. Thus, any potential increased demand is more likely to fall on emergency/hospital services. However, the degree of effect is not well understood, although it is noted in Cambridgeshire Health Authority (2000) that ‘larger site developments tend to have better safety records than smaller sites’.

13.7.106 Without detailed information regarding emergency/hospital services capacity and operating plans it is not possible to make a prediction on the effect on health services during this phase. However, it should be noted that the development would immediately follow an extended period of construction works in the area (CTRL), which have had a very good safety record. The CTRL project has achieved an exceptionally low accident frequency rate of 0.44 reportable accidents for every 100,000 man-hours worked, three times better than the industry norm of 1.3. In Area 100, which encompasses the works to St Pancras station and the King’s Cross Railway Lands the record has been even better than this and two of the major contracts have exceeded 1 million man-hours without a reportable incident. The CTRL project’s health and safety performance won the Health and Safety Executive’s 2003 “Working Well Together” Communication Award and the 2004 Royal Society for the Prevention of Accidents (RoSPA) Gold Award for Occupational Behaviour.

13.7.107 The Applicants would learn from the CTRL project and build on this example of best practice, and others, through the implementation of the King’s Cross Central proposals. Any potential increase in demand on emergency/hospital services associated with the construction phase are likely to be minimal with effective site management and implementation of appropriate Health and Safety Plans.

**Assessment of Significance**

13.7.108 The predicted effects on health services are summarised below:
Table 13.22: Assessment of Health Services Effects on Health

<table>
<thead>
<tr>
<th>EFFECT OF DEVELOPMENT</th>
<th>SIGNIFICANCE OF EFFECT ON HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional pressure on health services already operating beyond capacity</td>
<td>Moderate adverse without new provision/investment to meet the needs of the development.</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor to Moderate</td>
<td>Beneficial with new provision/investment to meet the needs of the development, plus associated (wider) benefits</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased recruitment and retention and opportunities for rationalisation</td>
<td>Minor to Moderate beneficial</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13.7.109 The benefits of health service provision/investment as described, to meet the needs arising directly from the development, would result in a more favourable people per GP ratio (compared to the existing scenario) and extend the benefits into the wider community and begin to redress the capacity issues currently encountered. Therefore, with new provision/investment in place and with the additional benefits of increased recruitment, retention and rationalisation, the cumulative effects on primary care health service provision could be greater than as stated in the table above, with Beneficial effects of Moderate significance (positive, qualitative and highly likely).

Effects without the Triangle Site

13.7.110 The assessments set out above would not change should the Triangle Site not be developed. There is sufficient D1 floorspace on the Main Site to accommodate any needs arising from the new development and its population.

Effects with the LUL Phase 2 and King’s Cross Station Enhancement

13.7.111 The ongoing Phase 2 works (Northern Ticket Hall and associated infrastructure) are due to be complete by 2007 but are the subject of a current review that may affect the timing of their completion. It is possible, therefore, that the works to complete the project (scheduled to last 3 years) could still be underway in 2007, alongside the development of King’s Cross Central.

13.7.112 If the King’s Cross Station Enhancement proposals go ahead, there is a range of possible timescales, including the following:-

a) construction could commence following completion of the LUL Phase 2 (Northern Ticket Hall) works with construction of Station Enhancement expected to last a maximum of 4 years; or

b) combined with the LUL Phase 2 (Northern Ticket Hall) into an integrated project likely to take less than the 7 years identified above for the two projects to take place are after the other.

13.7.113 Neither of these projects, alongside King’s Cross Central, are likely to lead to any significant additional/cumulative effects on local health services.
13.8 Opportunities for Further Mitigation/Enhancement Measures

13.8.1 Mitigation/enhancement measures that would have an effect on determinants of health are set out in the relevant parts of other topic-based chapters, for example noise, air quality and socio-economics. They are therefore not repeated here.

13.8.2 Part 12 of the Environmental Statement recommends that the applicants, Local Authorities and other partners should prioritise facilities sustainable long term solutions for a number of community facilities and services and these include GP/healthcare facilities. This recommendation takes account of the Part 13 findings reported above.

13.8.3 The long-term provision of facilities for the additional working/visitor population is a related issue and an opportunity for further enhancement. GP services are traditionally allocated based on residential information. However, there is a growing trend for walk-in centres, both NHS and privately run (as well as some partnerships between the two), providing access to consultations without an appointment. The location of these facilities varies from shopping centres and railway stations to hospitals and airports. Monitoring of patients utilising the Newham NHS Walk-in Centre has revealed that approximately 40% are made up of non-resident workers, students, tourists and visitors to the area (NHS Information Authority, accessed 27 January 2004). There are currently no facilities of this nature within the locality of the development, however, the increase in resident and working populations may stimulate development of this kind, funded either by the NHS or privately.

13.8.4 Capitalising on the opportunities for rationalisation of services presented by the greater connectivity afforded by the development would be a matter primarily for consideration for the PCTs. The wider Health Impact Assessment that is underway may assess these opportunities in more detail.

13.9 Monitoring

13.9.1 Details of monitoring pertaining to each of the relevant determinants of health are provided in the appropriate Specialist Reports.
13.10 References


Bardsley et al, 1998, Housing and health in London: A review by the Health of Londoners project. East London and the City Health Authority.


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Mutale, E., and Edwards, M., 2002, Summary of surveys of households and enterprises, the Bartlett School of Planning for the Kings Cross Partnership


Appendix 13A  Determinant/Health Linkages Matrix

Determinant/Health Linkages Matrix

The table below sets out the range of health effects associated with the selected determinant indicators, as described in literature sources. These do not necessarily represent causal relationships and the onset of the health effects is often the result of a range of factors; in many cases changes to the determinants make the onset of the health effects/symptoms more or less likely. In many cases there are compounding effects, with links to other determinants of health.

References utilised include:

- Reports prepared by local/regional and national authorities including the Greater London Authority, the UK Government, the Welsh Assembly Government, Health of Londoners Project etc.
- Information sources for HIA practitioners, including Cave et al. (2001) and Bardsley et al. (2001) etc
- HIAs on recent projects – utilising evidence bases stated for comparable effects.

The matrix below provides a snapshot of the information that is available and is by no means complete. However, it does provide an understanding of the types of health issues associated with the selected determinants of health and areas in which improvements could be made through carefully planned regeneration.
## UNEMPLOYMENT

<table>
<thead>
<tr>
<th>Action/ Status</th>
<th>Associated Health Issues</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>Negative effects: Ill health [^2,3,4], injuries [^2,3], poisoning [^2,3], premature mortality [^2,3,4,5,6], coronary heart disease [^2,3], depression [^2,3,4,5,6], anxiety [^2], self harm [^2,3], suicide [^2,3], health related behaviour issues [^2,3,4], cardiovascular disease [^4,5,7], general psychological disturbance [^2,4,6], psychiatric admissions [^4,5], cancer [^4,5], accidents [^6], bronchitis [^5]. Positive effects: Reduction in musculoskeletal disease [^4], reduction in accidents [^4,5], reductions in stress/anxiety [^5].</td>
<td>Indirect effects may be seen on housing [^4] and income [^2,3,6]. Contributory factors include education [^2,3] and social class [^2]. Effects exacerbated by lack of social support networks [^6]. Access to employment is crucial to participation in economic and social opportunities [^5].</td>
</tr>
<tr>
<td>Poor quality employment</td>
<td>Negative effects: Ill health [^4], psychological disturbance [^4,5], coronary heart disease [^4,8,9], psychiatric disorder [^9].</td>
<td></td>
</tr>
<tr>
<td>Threat of unemployment</td>
<td>Negative effects: Cardiovascular disease [^4], sleep disturbance [^4], morbidity [^4,8], poor psychological health (including depression and anxiety) [^4,6], increased cholesterol levels [^8].</td>
<td></td>
</tr>
<tr>
<td>Long term unemployed</td>
<td>Negative effects: Low levels of psychological well-being [^2,4], compounding negative effects described above [^7], increased cardiovascular mortality (within 3 years) [^7], increased morbidity [^4], increased mortality risk [^8].</td>
<td></td>
</tr>
</tbody>
</table>

## ETHNICITY AND UNEMPLOYMENT

<table>
<thead>
<tr>
<th>Action/ Status</th>
<th>Associated Health Issues</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment amongst BME groups</td>
<td>Psychological effects compounded when discrimination is a factor [^2].</td>
<td></td>
</tr>
</tbody>
</table>

## EDUCATIONAL ATTAINMENT

<table>
<thead>
<tr>
<th>Action/ Status</th>
<th>Associated Health Issues</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative effects: Health related behaviour issues [^2,3], psycho-social health [^7].</td>
<td>Indirect effects may be seen on employment [^7], income [^7], plus long term effects on other health indicators due to educational attainment [^7].</td>
<td></td>
</tr>
</tbody>
</table>

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\[^2\] Greater London Authority (2002)
\[^3\] British Medical Association (1999)
\[^4\] Cave et al (2001)
\[^5\] Southampton and South West Hampshire Health Authority (2001)
\[^6\] Hansell and Aylin (2000)
\[^7\] Bardsley et al (2001)
\[^8\] Camden and Islington Health Authority (2000)
\[^9\] Secretary of State for Health (1999)
## PROPORTION OF HOMES JUDGED UNFIT TO LIVE IN

<table>
<thead>
<tr>
<th>Action/ Status</th>
<th>Associated Health Issues</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>General poor housing</td>
<td><strong>Negative effects:</strong> Contribute to/cause ill health ((^2)), exacerbate existing conditions ((^2)), stomach cancers ((^4)), mental health issues ((^4,10)), accidents ((^11)), respiratory disease ((^10,11)), excess winter deaths ((^11)), cardiovascular morbidity ((^11)), heart disease ((^10)), strokes ((^10)), asthma ((^10)), infectious diseases ((^10))</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Children specific:</strong> Development delay ((^10)), bed-wetting ((^10)), injuries ((^10))</td>
<td></td>
</tr>
<tr>
<td></td>
<td>References do not specify which aspect of poor housing the health effects relate to – it is likely that these effects are repeated under the different headings below.</td>
<td></td>
</tr>
<tr>
<td>Poor indoor air quality (CO, radon, tobacco smoke, NO(_2) from gas cookers, dust mites)</td>
<td><strong>Negative effects:</strong> CO poisoning ((^2,12)), cancer ((^2)), cancer ((^2)), respiratory disease ((^2)), asthma ((^2)), NO(_2) poisoning ((^12))</td>
<td>Links for children to poor educational attainment ((^10))</td>
</tr>
<tr>
<td>Poor housing – damp, mould, cold, infestation, overcrowding</td>
<td><strong>Negative effects:</strong> Respiratory problems (incl. asthma, rhinitis, alveolitis) ((^2,4,6,9,12,13)), infections ((^2,12)), allergic disease ((^1)), heart disease ((^2,12)), stroke ((^2,12)), hypothermia ((^2,12)), excess winter deaths ((^2,6,12)), chest problems ((^4)), chronic sickness ((^4)), chronic disability ((^4)), Mental issues (incl. emotional strain, nervousness) ((^4,6,12)), susceptibility to other illnesses ((^4)), negative effects on child development ((^4)), gastrointestinal upsets ((^4,6,12)), fatigue ((^4)), reduced resistance to respiratory infections ((^13)), infectious diseases (tuberculosis) ((^12)), general ill-health ((^12)), cancers (esp. stomach) ((^12)), short stature ((^12))</td>
<td>Adverse effects on social well-being and quality of life due to having to use a larger proportion of household income on keeping warm ((^13)).</td>
</tr>
<tr>
<td>Poor lighting/design (incl. high rise)</td>
<td><strong>Negative effects:</strong> Accidents ((^2,4,12,14)), fires ((^2,12)), falls ((^12)), stress/mental health issues ((^12)), developmental problems in children ((^12))</td>
<td>Can encourage infestation ((^12)) (see above for effects)</td>
</tr>
<tr>
<td>Poor sanitation</td>
<td><strong>Negative effects:</strong> Gastro-intestinal diseases ((^2,12)), stress-related illness ((^12))</td>
<td></td>
</tr>
<tr>
<td>LA/rented accommodation</td>
<td><strong>Negative effects:</strong> Increased mortality risk ((^2))</td>
<td></td>
</tr>
</tbody>
</table>

---

10 British Medical Association (2003)
11 Barnes and MacArthur (2000)
13 McCarthy (1999)
14 Wanless (2003)
### CRIME

<table>
<thead>
<tr>
<th>Action/ Status</th>
<th>Associated Health Issues</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative effects:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High mortality (2), physical trauma (2,12), mental illness/stress (2,12)</td>
<td>Lower income associated with higher burglary rates (2). Negative effects on social interactions (12)</td>
</tr>
</tbody>
</table>

### SOCIAL CAPITAL

<table>
<thead>
<tr>
<th>Action/ Status</th>
<th>Associated Health Issues</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor levels of social capital/cohesion</td>
<td>Negative effects on:</td>
<td>Linkages to other determinants of health such as income inequality, educational attainment and violent crime</td>
</tr>
<tr>
<td></td>
<td>Mortality (4), self-assessed health (4), cardiovascular disease (4), accidents and suicides (4), mental health (4), life expectancy (4)</td>
<td></td>
</tr>
<tr>
<td>Promotion of exercise opportunities through open space/leisure facilities</td>
<td>Positive effects on:</td>
<td>Incorporation of exercise into a daily routine is important</td>
</tr>
<tr>
<td></td>
<td>Mortality (4), mortality (4,14), incidence of myocardial infarction (4), ischaemic/atheromatous heart disease (4,15), cerebrovascular disease (4,15), general cardiovascular fitness (4), onset of hypertension (4), onset of osteoporosis (15), obesity (4,15), mental health (4)</td>
<td></td>
</tr>
</tbody>
</table>

### AIR QUALITY INDICATORS

<table>
<thead>
<tr>
<th>Action/ Status</th>
<th>Associated Health Issues</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative effects:</td>
<td>Most respiratory disease is due to self-induced lung damage from smoking (13). Uncertainty about the effects of emissions (5,15). Effects are most likely to aggravate a pre-existing condition (5,15).</td>
</tr>
<tr>
<td></td>
<td>Impair (deep) lung function (4,5), mucosal inflammation/toxicity (4,15), tissue sensitivity (4), respiratory symptoms/infection/disease (2,4,5,13,15,16)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>increased mortality (4,5,13,15), cardiovascular disease/symptoms (2,13), increased susceptibility to lung infection (2), cancers of the blood and lymphoid system (13), inflammation/narrowing of the airways (5,13,15), asthma (and symptoms of) (13,15), ischaemic heart disease (15), aggravation of bronchitis (15), lung cancer (15)</td>
<td></td>
</tr>
</tbody>
</table>

---

15 Soderlund et al (1996)

16 Cambridgeshire Health Authority (2000)
### ROAD TRAFFIC ACCIDENTS

<table>
<thead>
<tr>
<th>Action/ Status</th>
<th>Associated Health Issues</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative effects:</td>
<td>Major cause of death (15), psychiatric problems associated with trauma/bereavement (15), fear of accidents, especially young and elderly (15)</td>
<td>Accidents (incl. risk of injury to child pedestrians) associated with traffic volume (4, 15, 16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increased risk associated with curb parking (4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increased risk with mean speeds over 40kph (4) (speed as an issue (15, 14))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Higher accidents rates for children of lower socio-economic class/income (2, 4, 6, 17). Other pedestrian accident rates linked to deprivation (15).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Particular issue for children and the elderly (12)</td>
</tr>
</tbody>
</table>

### NOISE

<table>
<thead>
<tr>
<th>Action/ Status</th>
<th>Associated Health Issues</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>High levels of noise</td>
<td>Negative effects:</td>
<td>Related to the level of sound and its duration (16)</td>
</tr>
<tr>
<td></td>
<td>Permanent hearing damage (5, 15, 16), aural damage (5)</td>
<td></td>
</tr>
<tr>
<td>Lower levels of noise - annoyance</td>
<td>Negative effects:</td>
<td>Lack of information available (13, 15, 19)</td>
</tr>
<tr>
<td></td>
<td>Disturbed sleep (5, 13, 16), interrupted study (16), hypertension (13), general annoyance (13, 16), interference with speech communication (5), effects on performance and child health (5, 18), anxiety/psychological stress (5)</td>
<td>Level of annoyance dependent on noise source (16) and sensitivity of individuals (5)</td>
</tr>
<tr>
<td></td>
<td>Secondary health effects: cardiovascular disease (5), immune system effects (5), altered social behaviour (5)</td>
<td></td>
</tr>
</tbody>
</table>

17 Roberts & Power (1996)
18 Shield and Dockrell (2002)
19 SAHSU (2000)
## Appendix 13B  
### Health Services Inventory

**General Practitioners**

<table>
<thead>
<tr>
<th>Code</th>
<th>Borough</th>
<th>Ward</th>
<th>GP Practice Description</th>
<th>Address</th>
<th>No of GPs</th>
<th>Sex</th>
<th>Clinics</th>
<th>Services</th>
<th>Other Languages</th>
<th>Additional Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP1</td>
<td>Camden</td>
<td>Kings Cross</td>
<td>Assi</td>
<td>76 Cromer Street</td>
<td>1</td>
<td>M</td>
<td>None</td>
<td>MS, CHS, M, OL, IUD</td>
<td>Arabic, French</td>
<td>None</td>
</tr>
<tr>
<td>GP2</td>
<td>Camden</td>
<td>Kings Cross</td>
<td>Robinson - The Bloomsbury Surgery</td>
<td>1 Handel Street</td>
<td>2</td>
<td>1xF, 1xM</td>
<td>FP, A, M+B</td>
<td>MS, CHS, M, OL, IUD</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>GP3</td>
<td>Camden</td>
<td>Kings Cross</td>
<td>Kings Cross Road Surgery</td>
<td>159-161 Kings Cross Road</td>
<td>1</td>
<td>M</td>
<td>FP</td>
<td>M, IUDs</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>GP4</td>
<td>Camden</td>
<td>St Pancras and Somers Town</td>
<td>Cowan - Amphiambill Square Medical Centre</td>
<td>219 Evershot Street</td>
<td>4</td>
<td>2xF, 2xM</td>
<td>FP, A, M+B</td>
<td>MS, CHS, M, OL, IUD</td>
<td>French</td>
<td>None*</td>
</tr>
<tr>
<td>GP5</td>
<td>Camden</td>
<td>St Pancras and Somers Town</td>
<td>Petrou</td>
<td>53 Crowndale Road</td>
<td>1</td>
<td>M</td>
<td>FP, A, M+B</td>
<td>M, IUD</td>
<td>Arabic, Greek, Portuguese</td>
<td>None</td>
</tr>
<tr>
<td>GP6</td>
<td>Camden</td>
<td>St Pancras and Somers Town</td>
<td>PCHP (Homeless)</td>
<td>St Pancras Hospital</td>
<td>1</td>
<td>F</td>
<td>?</td>
<td>?</td>
<td>Primary care for the homeless</td>
<td>Unknown</td>
</tr>
<tr>
<td>GP7</td>
<td>Camden</td>
<td>St Pancras and Somers Town</td>
<td>Shina</td>
<td>67 Plender Street</td>
<td>1</td>
<td>M</td>
<td>FP, A, M+B</td>
<td>M, IUD</td>
<td>French</td>
<td>?</td>
</tr>
<tr>
<td>GP8</td>
<td>Camden</td>
<td>St Pancras and Somers Town</td>
<td>Parry - Somers Town Medical Centre</td>
<td>77-83 Chalton Street</td>
<td>1</td>
<td>F</td>
<td>?</td>
<td>MS, CHS, M, OL, IUD</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>GP9</td>
<td>Islington</td>
<td>Caledonian</td>
<td>Coutinho - Roman Way Medical Centre</td>
<td>58 Roman Way</td>
<td>3</td>
<td>1xF, 2xF</td>
<td>FP, A, M+B</td>
<td>CHS, M, OL, IUD</td>
<td>Gurjarati, Hindi</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes:**
- FP = family planning; A = antenatal; M+B = mother and baby; MS = minor surgery; CHS = child health surveillance; M = maternity; OL = obstetric list; IUD = IUDs; ? = unknown.
- * although intention to reopen soon to new patients
## Dental Practices

<table>
<thead>
<tr>
<th>Code</th>
<th>Borough</th>
<th>Ward</th>
<th>Practice</th>
<th>Address</th>
<th>Additional Capacity (NHS patients)</th>
<th>Treating non-registered</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Camden</td>
<td>Kings Cross</td>
<td>Raval Dental Practice</td>
<td>86 Cromer Street</td>
<td>Yes</td>
<td>Occasional</td>
</tr>
<tr>
<td>D2</td>
<td>Camden</td>
<td>Kings Cross</td>
<td>Travers Dental Surgery</td>
<td>96 Marchmont Street</td>
<td>Yes</td>
<td>Occasional</td>
</tr>
<tr>
<td>D3</td>
<td>Camden</td>
<td>Kings Cross</td>
<td>Gandhi and Chan Dental Surgery</td>
<td>231 Grays Inn Road</td>
<td>Yes</td>
<td>Occasional</td>
</tr>
<tr>
<td>D4</td>
<td>Camden</td>
<td>St Pancras and Somers Town</td>
<td>Stern Dental Surgery</td>
<td>11 Crowndale Road</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

## Pharmacies

<table>
<thead>
<tr>
<th>Code</th>
<th>Borough</th>
<th>Ward</th>
<th>Practice</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Camden</td>
<td>Kings Cross</td>
<td>John Walker Chemists</td>
<td>Leigh Street (off Judd Street)</td>
</tr>
<tr>
<td>P2</td>
<td>Camden</td>
<td>St Pancras and Somers Town</td>
<td>Evergreen Pharmacy</td>
<td>106 Eversholt Street</td>
</tr>
<tr>
<td>P3</td>
<td>Camden</td>
<td>St Pancras and Somers Town</td>
<td>Gould Ltd</td>
<td>14 Crowndale Road</td>
</tr>
<tr>
<td>P4</td>
<td>Camden</td>
<td>St Pancras and Somers Town</td>
<td>Ampthill Pharmacy</td>
<td>217 Eversholt Street</td>
</tr>
<tr>
<td>P5</td>
<td>Islington</td>
<td>Caledonian</td>
<td>Carters Chemist</td>
<td>47 Roman Way</td>
</tr>
</tbody>
</table>

## Opticians

None found within Central Impact Zone
Appendix 13C  Traffic Accident Data
APPENDIX 1 – ACCIDENT ANALYSIS

0.1 Accident Analysis

0.1.1 The personal injury accident data for York Way in the vicinity of the development site has been obtained from the London Borough of Camden for the 5 year period between 01/06/1998 to 31/05/2003. This data looks specifically at accidents occurring along York Way, from Vale Road in the North, to the King’s Cross Gyratory in the south. This section of York Way has been identified for analysis since it is the main link around the site where pedestrian movements associated with the development will have the greatest conflict with local vehicle movements. The accident plots are provided in Annex 1 to this appendix.

0.1.2 The accident analysis has been divided into 3 sections, A, B and C as follows. Section A considers York Way to the north of the junction with Goods Way; Section B includes York Way to the north of the King’s Cross Gyratory, including the Goods Way Junction. The last section, C, looks at the King’s Cross Gyratory.

0.1.3 The data includes the total number of accidents occurring at a particular junction and the category that a casualty belongs to; cycles, pedestrians, children and OAP’s. The results of the accident analysis for York Way is summarised in Tables A1.1 – A1.3 as follows:

**Table A1.1 - Section A – Accident Analysis – York Way, north of Goods Way junction**

<table>
<thead>
<tr>
<th>Junction</th>
<th>Vehicles</th>
<th>Cycles</th>
<th>Pedestrians</th>
<th>Children</th>
<th>OAP’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>York Way / Copenhagen St</td>
<td>12</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>York Way / Bingfield St</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>York Way / Randalls Rd</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>York Way / Vale Rd</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>York Way / Broadfield Ln</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>26</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

0.1.4 At the York Way / Copenhagen St Junction there were several accidents occurring whereby a vehicle hit a pedestrian crossing at a marked crossing point. These accidents were most common during the daytime. There is clearly the capacity to improve the existing pedestrian faculties in this area to reduce the trend in pedestrian accidents.
Table A1.2 - Section B Accident Analysis – York Way, King’s Cross Gyratory to junction with Goods Way

<table>
<thead>
<tr>
<th>Junction</th>
<th>Vehicles</th>
<th>Cycles</th>
<th>Pedestrians</th>
<th>Children</th>
<th>OAP’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pancras Rd / Goods Way</td>
<td>12</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>York Way / Railway St</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>York Way / Wharfdale Rd</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Camley St / Goods Way</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>York Way / Crinian St</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>York Way / Goods Way</td>
<td>16</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Battlebridge Rd / Goods Way</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>52</td>
<td>11</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

0.1.5 It can be seen in Table A1.2 above that the entire pedestrian accidents along this section the York Way occurred at the junction with Goods Way. Similarly to the York Way /Copenhagen Street junction, there is an obvious need to improve pedestrian crossings at this location and this is addressed as part of the full highways assessment.

0.1.6 The analysis of Sections C shows that there was a trend of accidents in the vicinity of Wharfdale Road/York Way were a number of accidents occurred as a result of drivers losing control of their vehicles. There is nothing to suggest poor road alignment at this location, more likely to be associated with excess vehicle speeds.

Table A1.3 - Section C Accident Analysis –King’s Cross Gyratory

<table>
<thead>
<tr>
<th>Junction</th>
<th>Vehicles</th>
<th>Cycles</th>
<th>Pedestrians</th>
<th>Children</th>
<th>OAP’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birkenhead St / Euston Rd</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grays Inn Rd / Euston Rd</td>
<td>15</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Grays Inn Rd / Birkenhead St</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Euston Rd / York Way</td>
<td>16</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Grays Inn Rd / Pentonville Rd</td>
<td>9</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pentonville Rd / York Way</td>
<td>18</td>
<td>2</td>
<td>16</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Pentonville Rd / Euston Rd</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>York Way / Caledonian Rd</td>
<td>8</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Caledonian Rd / Pentonville Rd</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>76</td>
<td>8</td>
<td>36</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

0.1.7 In summary there have been a total of 222 accidents along York Way with 48 of these involving pedestrians. There is high pedestrian activity at the King’s Cross Gyratory due to the immediate location to the entrance to King’s Cross station. The crossing points across the roads increases the potential for conflicts between cars and pedestrians and provides a reasonable explanation for the high number of pedestrian accidents. It may be noted that 8 of the pedestrian accidents occurred in one event.
The majority of vehicle accidents have been shunt types and these are mainly due to the nature of traffic movements in the area, particularly stop-start traffic through the junction.
Annex 1
Accident Location Plots
Acc017_Collisions of all types
01/06/1998 to 31/05/2003

- 11 collisions at location (1)
- 7 collisions at location (2)
- 6 collisions at location (1)
- 5 collisions at location (4)
- 4 collisions at location (1)
- 3 collisions at location (6)
- 2 collisions at location (13)
- 1 collision at location (55)
King’s Cross Central

Environmental Statement

Volume 3: Part 14 Nature Conservation Specialist Report

Prepared for Argent St George, London and Continental Railways and Exel by RPS

May 2004
Part 14 – Nature Conservation Specialist Report

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14G Invertebrate Appraisal
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14I Relationship between Core Infrastructure Works and Principal Development Zones

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14.1 Significance of Ecological Impacts
14.2 Numbers of Pairs/Territories of Breeding Birds of Conservation Concern April-June 2001
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Figures

Figure 14.1  Ecology Designated Sites
Figure 14.2  Ecology 2006/2007 Baseline
14 Nature Conservation Specialist Report

14.1 Introduction

14.1.1 For the purposes of this assessment of nature conservation effects, King's Cross Central comprises the Main Site and the Triangle Site. The study area for this assessment consists of the proposed development site itself (comprising the proposals in the planning applications for both the Main Site and the Triangle Site) and its environs, extending to approximately 1km from the boundary of the site. The site and its surroundings are described in Part 2.1 of this Environmental Statement. The site largely comprises previously developed land in an urban setting and its ecology and nature conservation status reflect this.

14.2 Methodology and Assessment Criteria

14.2.1 The assessment of nature conservation effects follows the guidance set out in:


14.2.2 A desk study comprising information provided by relevant consultees and a review of reports relevant to Kings Cross Central has been conducted. The desk study findings and consultees’ responses are summarised in this report.

14.2.3 Based on the findings of the desk study, inspection of the site, and the findings of a habitat survey, a number of surveys were commissioned in 2001 by the Applicants to provide baseline ecological data for King’s Cross Central. These surveys comprised:

- Aquatic plants, habitats and invertebrates
- Terrestrial invertebrates
- Amphibians
- Bats
- Reptiles
- Breeding birds

14.2.4 A further survey for black redstart was carried out in 2002, and a tree survey was carried out in January 2004.

14.2.5 The findings of the desk study and the site surveys have been used to describe the existing ecology and nature conservation interest of the site. As explained later in this report, the site has been subject to major changes as a result of the Channel Tunnel Rail...
Link Works, during and following the period over which the surveys were undertaken. The effect of these works on the ecology of the site is explained.

14.2.6 As explained in Part 1.3 of this Environmental Statement, the baseline year for the assessment of the effects of the King’s Cross Central proposals is 2006/2007. This is when the Channel Tunnel Rail Link works will be completed and the Kings Cross Central development would commence. The further effects of the Channel Tunnel Rail Link on the ecology of the site up to completion by 2007 have been taken into account in assessing the predicted baseline conditions for assessment.

14.2.7 In assessing the nature conservation effects of the proposals, the characteristics of the proposed development, as set out in the Development Specifications for both the Main Site and the Triangle Site, have been considered, and the potential for effects, both negative and positive, assessed. The significance of any effects has been determined in terms of the importance/value and sensitivity of the habitats and species which would be affected in a local, regional, and national context. Impacts have been graded as minor, moderate or major, positive or negative, or neutral.

14.2.8 The following matrix has been used as a guide in assessing the significance of impacts (IEEM, 2002).

### Table 14.1 Significance of Ecological Impacts
(based on Institute of Ecology and Environmental Management, 2002)

<table>
<thead>
<tr>
<th>Impact Magnitude</th>
<th>Value of Feature</th>
<th>International</th>
<th>National</th>
<th>Regional</th>
<th>County/ Metropolitan</th>
<th>District/ Borough</th>
<th>Parish/ Neighbourhood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Negative</td>
<td>Critical</td>
<td>Critical</td>
<td>Critical - Moderate</td>
<td>Major - Moderate</td>
<td>Moderate - Minor</td>
<td>Minor - Moderate</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>Major - Minor</td>
<td>Major - Moderate</td>
<td>Major - Minor</td>
<td>Moderate - Minor</td>
<td>Moderate - Minor</td>
<td>Minor</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td></td>
<td></td>
<td>Neutral</td>
<td>Minor</td>
<td>Minor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>Major - Minor</td>
<td>Major - Moderate</td>
<td>Major - Minor</td>
<td>Moderate - Minor</td>
<td>Moderate - Minor</td>
<td>Minor</td>
<td></td>
</tr>
<tr>
<td>Major Positive</td>
<td>Critical</td>
<td>Critical</td>
<td>Critical - Moderate</td>
<td>Major - Moderate</td>
<td>Moderate - Minor</td>
<td>Minor - Moderate</td>
<td></td>
</tr>
</tbody>
</table>

14.2.9 Where practicable, where potential negative impacts have been identified, means to mitigate those impacts have been incorporated into the design of the proposals. The effectiveness of this mitigation is taken into account in the assessment of the significance of impacts. Opportunities for further mitigation measures, which are not currently included in the proposals, are also identified. Such further mitigation has not been taken into account in the assessment.

### Nature Conservation Policies and Guidance

14.2.10 Planning policies which are relevant to Kings Cross Central are explained in Part 1.2 of this Environmental Statement.
The Mayor of London’s Biodiversity Strategy (July 2002)

14.2.11 The London biodiversity strategy is the first regional biodiversity strategy with a statutory basis. At the same time, it does not form part of the development plan and its policies are not planning policies. The objectives of the strategy are as follows:

**Biodiversity for people:** to ensure all Londoners have ready access to wildlife and natural spaces.

**Nature for its own sake:** to conserve London’s plants and animals and their habitats.

**Economic Benefits:** to ensure the economic benefits of natural greenspace and greening are fully realised.

**Functional benefits:** to ensure London enjoys the functional benefits that biodiversity can bring.

**Sustainable development:** to recognise biodiversity conservation as an essential element of sustainable development.

**Policies**

14.2.12 The strategy contains the following policies which are most relevant to the King’s Cross Central proposals:

**Policy 1:** The Mayor will work with partners to protect, manage and enhance London’s biodiversity.

**Policy 2:** The Mayor recognises the unique role of waterways and in particular the River Thames in London’s history and in the lives of Londoners, and their value for transport, recreation, biodiversity and archaeology. In recognition of their importance, the Mayor has set up the concept of a Blue Ribbon Network for the Thames and London’s waterways and the land alongside them. This will establish principles concerning the use and management of the water and land beside it.

**Policy 3:** The Mayor will encourage and promote the management, enhancement and creation of green space for biodiversity, and promote public access and appreciation of nature.

**Policy 5:** The Mayor will seek to ensure that opportunities are taken to green the built environment within development proposals and to use open spaces in ecologically sensitive ways. This is particularly important in areas deficient in open spaces and in areas of regeneration.

**Policy 6:** The Mayor will promote local opportunities for regular direct contact with the natural world, through a variety of types of open space (such as allotments, community and cultural gardens, school grounds, environmental education centres and city farms, as well as informal wildlife areas).

**Policy 11:** The Mayor will encourage the business community to play a major role in implementing the programme for conserving London’s biodiversity.

**Policy 12:** The Mayor will encourage practices, and support existing effective initiatives, that reduce London’s impact on biodiversity elsewhere.
Policy 13: The Mayor is committed to increasing the funding for biodiversity projects in London, and wishes to ensure that major new projects include provision for biodiversity.

Policy 14: Progress in conserving London’s biodiversity should be measured with particular reference to the status of important species and habitats, and progress on proposed actions or targets.

14.2.13 Under the Policies are 72 Proposals setting out the means by which the Policies will be implemented. A number of the Proposals are relevant to King’s Cross Central and are referred to below. The number in brackets after the Proposal number refers to the Policy to which the Proposal relates.

Conservation of Species and Habitats

14.2.14 The strategy aims to ensure no net loss of wildlife habitat, and there should ideally be a net increase in habitats through enhancement and habitat creation (para 4.11). Proposal 1 (1) requires boroughs to give strong protection to Sites of Metropolitan Importance. Proposal 2 (1) states that boroughs should identify and protect Sites of Borough and Local Importance.

14.2.15 Proposal 4 (1) notes that where, exceptionally, development is permitted which has an adverse impact on a Site of Importance for Nature Conservation or other local designation or on the population or conservation status of protected or priority species, the Mayor will and boroughs should aim to secure compensatory measures in mitigation.

14.2.16 Proposal 5 (1) refers to the need for boroughs to take into account the protection of wildlife habitats and biodiversity in the consideration of all planning applications. This includes sites where the habitats and species are not designated (para 4.25).

14.2.17 Proposal 6 (1) states that the Mayor and boroughs should ensure that new development capitalises on opportunities to create, manage and enhance wildlife habitat and natural landscape. Priority should be given to sites within or near to areas deficient in accessible wildlife sites, areas of regeneration and adjacent to existing wildlife sites.

Biodiversity in EIA and other Assessments

14.2.18 Paras 4.42-4.45 refer to the need for EIA for major development proposals, and for consideration of biodiversity where formal EIA is not required. Proposal 8 (1) states that for development proposals that may have a significant environmental impact, the Mayor expects the options to be refined only after full investigation of the existing situation and the preparation of a statement of the environmental impact of all options.

Wasteland and Black Redstarts

14.2.19 To the extent that parts of the King’s Cross Central site may be considered to have characteristics of ‘wasteland’, para 4.36 refers to habitat loss and states that, not surprisingly, a very large proportion of ‘wasteland’ habitat has been lost in recent years.

14.2.20 At para 2.30 the value of such habitat for rare insects and birds, such as the black redstart, and for exotic plants is referred to. The strategy recognises that such sites are transient in nature, and many of the plants and animals which thrive in them are adapted to rapidly colonising new sites. However, wasteland habitats are disappearing as a result of London’s thriving economy, with few sites becoming vacant as older ones are
redeveloped. The Government’s drive to accommodate new housing on brownfield land, which the Mayor supports, will increase the pressure on wasteland habitats.

14.2.21 Para 2.44 refers to London supporting about a quarter of Britain’s black redstarts. The bird is found on abandoned industrial sites and has a stronghold in the east Thames corridor. It is declining and could disappear if its needs are not taken into account when regenerating these areas.

14.2.22 Paras 4.19-4.22 explain that it is necessary to protect species afforded legal protection from the adverse effects of planning proposals. Any harm to a species, or its habitat, must be balanced with the benefit of a development proposal. The judgement would be made on the basis of the expected effect on the species and its abundance, rate of decline or degree of threat. Proposal 3(1) states that the Mayor and the boroughs should resist development that would have a significant adverse impact on the population or conservation status of protected or priority species.

14.2.23 Para 4.34 discusses the value of brownfield sites to nature conservation and their ability to support wildlife, such as black redstart. Para 4.37 states that brownfield sites should be considered for designation. Para 4.38 states that where wasteland habitats are lost to development, mitigation and compensation should provide similar habitats. Innovative approaches, such as creating wasteland habitat on roofs should be sought.

Regent’s Canal

14.2.24 Para 2.16 states that London’s canal system adds to the wealth of wetland habitat. Unlike many of London’s rivers, the canal system is almost entirely accessible via the towpaths, and thus provides valuable opportunities for informal recreation and contact with nature.

14.2.25 Paras 4.59-4.61 relate to the River Thames and London’s waterways, with particular reference to canals at 4.69-4.70. Proposal 19 (2) relates to the protection and enhancement of biodiversity near waterways and includes:

- ‘resisting development that results in a net loss of biodiversity
- designing new waterside developments in a way that increases habitat value
- recognising the Network as contributing to the open space network of London
- improving access to the Blue Ribbon Network, taking care not to disturb wildlife.’

Railway land

14.2.26 Para 2.28 refers to land owned or managed as part of London’s railway system forming an excellent network of green space throughout the city, and that there may be opportunities for enhancing the biodiversity of lineside area without compromising the operational interests of the owners. Nearly 1,000 ha of lineside have been identified as Sites of Importance for Nature Conservation.

Camley Street Natural Park

14.2.27 Para 2.56 refers to places which have been established where city people are able to enjoy the natural world, including Camley Street. The strategy states that these sites convey an important message that significant achievements for nature conservation are possible even in very urban settings, often on modest budgets, provided there is goodwill, optimism, commitment and professional back-up. Such projects often yield social benefits, providing a community focus where none existed before.
Para 4.147 refers to London’s record in urban biodiversity conservation which has resulted in its international reputation as a leader in the field. Camley Street Natural Park in particular is stated to have demonstrated that a valuable wildlife space can be created from nothing to become a hub of communal and educational activity.

Proposal 41 (7) states that the Mayor will work to improve the provision of and secure the long-term future of environmental education centres throughout London, especially where the need is greatest while proposal 42 aims to facilitate opportunities for environmental education, especially at local level.

Regeneration and the Built Environment

Para 2.31 refers to the opportunities which buildings can offer for plants and animals to colonise, and that buildings are increasingly being deliberately designed to provide habitats for wildlife, and contact with nature for their occupants. Such initiatives include traditional window boxes and roof gardens, and more innovative ideas such as providing suitable substrate on roofs to allow wasteland flora and fauna to colonise naturally. As London becomes more intensively developed, habitats within the built environment are likely to become increasingly important for some species, particularly those which depend on wastelands.

Paras 4.110-4.116 refer to ‘greening and regeneration’ and outlines measures which can be employed to establish natural features in the built environment. Policy 5 and proposals 33, 34 and 35 relate to such measures and the benefits which can be provided in areas of deprivation. Proposal 34 (3) states that the inclusion of greening initiatives in new developments would be encouraged.

Economic Development

Para 3.39 refers to the importance of London’s biodiversity in maintaining and enhancing the quality of life for Londoners, which may well bring economic benefits. The business community is thus expected to play a major role in implementing the biodiversity strategy. This is confirmed in Para 4.151. Opportunities should be taken to build biodiversity into new developments in all aspects of regeneration. It is also expected that important wildlife areas will be protected as part of a balanced approach to London’s redevelopment.

Biodiversity Action Plans

The UK’s commitments as a signatory to the Biodiversity Convention are outlined in Biodiversity: the UK Action Plan (1994). The UK Biodiversity Steering Group report was published in 1995 and included action plans for 116 of the UK’s most threatened and endangered species and for 14 key habitats. Further species and habitat action plans have subsequently been published. No priority habitats occur within the King’s Cross Central site.

Section 74 of the Countryside and Rights of Way Act 2000 provides a statutory basis for biodiversity conservation. Section 74 (1) requires Ministers and Government Departments to have regard to the purpose of conserving biological diversity in carrying out their functions, so far as is consistent with the proper exercise of those functions. A list of habitats and species important to biological diversity in England has been published as required by Section 74 (2) of the Act. Habitat and species action plans under the UK Biodiversity Action Plan are already in place or under preparation for all the listed habitats and species.
The Government published “Working with the Grain of Nature: a biodiversity strategy for England” in 2002. The purpose of the strategy is stated to be to ensure that biodiversity considerations become embedded in all the main sectors of economic activity, public and private. The introduction to the strategy states at para 1.4 that:

“Historically, the conservation of nature has been held as separate from, and often in conflict with, economic and social development. Truly sustainable development means recognising that we must continue to strive for economic and social development but increasingly find ways of going about our business with the grain of nature and natural systems. Indeed, in some cases biodiversity can be a key determinant or driver of social and economic development. Above all, we must recognise that the quality of our natural surroundings enhances the quality of our lives in the town, the country, on the coast and at sea.”

Chapter 7 explains the strategy in the context of towns, cities and developments. One of the focuses of the strategy set out at para 7.9 is stated to be:

“The planning and implementation of large-scale strategic and infrastructure projects that take full account of the needs of protected areas and species and wider biodiversity.

Large-scale projects, for example for transport and energy infrastructure, should take account of the potential impacts on biodiversity along with other environmental impacts at all stages from preliminary planning, through detailed design to implementation. For projects subject to the European Directive on Environmental Impact Assessment (EIA) effects on fauna and flora must be assessed. The Strategic Environmental Assessment (SEA) Directive, which will apply from 2004 to a range of plans and programmes that set frameworks for such projects, creates a specific requirement to consider effects on biodiversity. Mitigation of adverse effects and compensation for damage are required in some cases, for example under the EU Habitats and Birds Directives. Experience to date supports the view that in most instances development can live side by side with nature and damage to biodiversity can often be avoided by careful choice of location and design and by using opportunities for enhancement.”

The only UK Biodiversity Action Plan species recorded within the site is the Common pipistrelle bat.

The London Biodiversity Action Plan, prepared by the London Biodiversity Partnership, includes Habitat Action Plans for Wastelands and Canals

The Camden Biodiversity Action Plan includes a number of local habitat action plans. Those relevant to the King’s Cross Central proposals are those for Canalsides and Railsides, Waterways and Wetlands, and the Built Environment.

The Common pipistrelle is a UK Biodiversity Action Plan priority species. The London Biodiversity Action Plan includes a species action plan for bats, which includes the Common pipistrelle. The Camden Biodiversity Action Plan also has an action plan for bats.

The London Biodiversity Action Plan includes species action plans for the black redstart and the house sparrow.

The house sparrow is included in the red-list of birds of conservation concern, as are starling and linnet. These are species which have undergone a 50% or more decline in UK breeding population or range over the previous 25 years, or a historical decline over the period 1800-1995, or are species of global conservation concern.
14.2.43 The Camden Biodiversity Action Plan includes a species action plan for Odonata-Dragonflies and Damselflies. The Azure damselfly Coenagrion puella was recorded from ponds at Camley Street Natural Park and occurred in the former ponds at Goods Way.

London Boroughs of Camden and Islington, Kings Cross Opportunity Area, Planning & Development Brief, December 2003

14.2.44 Section 3.5 of the Planning and Development Brief explains the approach which the Councils seeks with respect to biodiversity. Para 3.5.2 identifies the Camley Street Natural Park and the Regent’s Canal as the principal nature conservation areas of importance within the Opportunity Area. The status of the North London Line and King’s Cross Goods Yard as a Site of Borough Importance (Grade 1) is referred to, as is the adjoining railside land in Islington. It is acknowledged that the Channel Tunnel Rail Link construction and other developments have removed most of the habitat in this area. There is reference to areas of under-used and vacant parcels of land that have some biodiversity value.

14.2.45 Para 3.5.3 states that the Councils wish to see the comprehensive redevelopment of the Area, to provide a high density, high quality mixed use development, and that it is thus inevitable, that existing site conditions will change radically. The Brief refers to Strategic Policy SKC1 (sub paragraphs f and g) which aims to minimise any adverse impacts on the environment, secure positive environmental gains and enhance opportunities for biodiversity as part of sustainable development.

14.2.46 The Brief also refers to the relevant policies of the Draft London Plan and those of the Camden UDP.

14.2.47 At para 3.5.7 the Brief states:

*Overall, the development of the Area and the Triangle offers scope to protect and enhance the principal areas of importance and provide additional opportunities for biodiversity. These include:*

- *Introducing new terrestrial habitat forms such as within the enclosed CTRL embankment, new open spaces, the northern and north-western boundaries of the Area;*
- *Incorporation of purpose designed shelters, roosts etc for new buildings and structures;*
- *The use of green and brown roofs (or equivalent system) for at least 15% of new buildings, vertical green habitat/walls and other means to add natural diversity, visual interest and capture other benefits, for example energy savings;*
- *The incorporation of ‘green’ trails linking habitats and green spaces;*
- *Co-ordinated vegetation planting within the public realm taking account of aesthetic, biodiversity, maintenance and other issues;*
- *Biodiversity information and interpretation points; and*
- *Enhanced visitor and interpretation facilities at Camley Street Natural Park.*
14.2.48 Paras 3.5.8 to 3.5.11 refer to Camley Street Natural Park which is owned by Camden Council and leased and managed by the London Wildlife Trust. The park is an important educational resource, used by local schools and other establishments. It is also open to, and used by, the general public. The London Wildlife Trust hopes to develop these roles in the future and has aspirations to develop an improved visitor centre, with more facilities. The retention and protection of the Park, as a wildlife and educational resource, is considered to be essential to the character of the area and new development. Camden Council expects new development to be sensitive and avoid any adverse visual, shading, microclimate, noise or lighting effects on the Park and to its long-term enhancement, as a biodiversity and educational resource.

14.2.49 Paras 3.5.12 to 3.5.15 refer to the Regent’s Canal as an important ecological corridor winding through north London and which is valued for its recreational, tourism, business, transport, residential and open space qualities. These often place competing pressures on this finite resource and use of the Canal is likely to increase as more people are introduced to the site and the Canal becomes more people friendly. This will have safety and other benefits. The brief states that it is important that redevelopment of the area captures the potential that the canal offers, striking a successful balance between the enhancement of the canal for biodiversity and other objectives.

14.2.50 Para 3.5.14 states that:

*The Canal’s important habitat value and biodiversity role could be enhanced by:*

- Reducing the presence of invasive species along the Canalside;
- Retaining or replacing areas of natural vegetation on the Canalside;
- Creating pocket habitats along the Canal edge, for example near bridges;
- Providing safe and secure nesting opportunities e.g. for Sandmartins and Kingfishers;
- Softening parts of the Canal wall, for example by creating vegetation benches and roosting sites;
- New aquatic and other planting to link the Canal, Camley Street Natural Park and adjacent areas; and
- The inclusion of bat friendly design features.

14.2.51 Under the heading Biodiversity Studies and Statements, para 3.5.16 states that:

*The Councils will assess any applications for development, within the Area and the Triangle, in relation to their effects on the conservation of biodiversity and expects developers to address biodiversity as part of their environmental impact assessment (EIA) studies. These studies should address the matters highlighted above, together with:*

- Any relevant requirements of the Habitat Regulations;
- The protection of species listed in the London and Camden Biodiversity Action Plans (BAPs); and
- The delivery of mitigation measures identified in the Environmental Statement, including the protection of retained habitats during phased construction.
Para 3.5.17 explains that the Councils will also be looking to see that the potential for conservation and enhancement of biodiversity has been fully explored and taken into account in strategies and statements that should accompany major development proposals.

### 14.3 Consultations

**14.3.1** As explained in Part 1.4 there has been an extensive programme of consultations relating to the Kings Cross Central proposals, based around a series of consultation documents, including the consultation draft Environmental Impact Assessment Scoping Report. The responses to the consultation draft Scoping Report relevant to Nature Conservation are summarised in this section.

**English Nature**

14.3.2 English Nature confirmed that the consultation draft scoping report considered all the main conservation issues of relevance for the Environmental Assessment (letter of 7 May 2003). They provided generic guidance regarding the preparation of the Environmental Statement. With respect to the specific King’s Cross Central proposals, English Nature strongly endorsed the suggested habitat creation for black redstart.

**Environment Agency**

14.3.3 The Environment Agency’s response (letter of 15 May 2003) referred to matters relating to surface water disposal and attenuation, sustainable urban drainage techniques, and proximity of development to watercourses. They made no specific reference to matters of ecology or nature conservation.

**Greater London Authority**

14.3.4 The response from the Biodiversity Team (letter of 14 March 2003) referred to the need to refer to the North London Link and the now greatly disturbed Kings Cross Goods Yard Sites of Borough Importance for Nature Conservation Grade 1. They considered that the table of potential impacts included within the consultation draft Scoping Report needed greater clarity and more detail, including opportunities for mitigation. They stated that there would need to be regular annual breeding surveys for black redstarts for the duration of the construction period.

**London Borough of Camden**

14.3.5 The response (letter of 3 June 2003) referred to the need for surveys of fish and aquatic life in the Regent’s Canal, the habitat qualities of the canal edge extending into Camley Street Natural Park, and non-breeding birds. Sites of Borough Importance for Nature Conservation should be identified at Kings Cross Goods Yard and Copenhagen Junction in Islington.

14.3.6 Important documents which should be referred to include the Mayor of London’s Biodiversity Strategy 2002, the London Biodiversity Action Plan, and the Camden Biodiversity Action Plan.
14.3.7 The response also stated that the assessment should acknowledge the species diversity and importance of ‘brownfield’ sites in the urban environment. Additional mitigation should be provided through seeking habitat creation for species other than the black redstart; re-colonisation opportunities for species, including terrestrial invertebrates, that existed prior to the CTRL work commencing; and an examination of the opportunities presented for temporary nurseries or habitats by the long term phasing of the development.

14.3.8 Given the scale and long period of development, surveys and monitoring studies are stated to be vital to ensure the effectiveness of mitigation measures. The response suggests that annual breeding surveys for black redstarts and other indicator species should be undertaken for the duration of the construction period.

London Borough of Islington

14.3.9 With respect to nature conservation, the response (11 June 2003) stated that the report seemed to be a reasonable assessment of the impacts which need to be assessed although a more pro-active approach to mitigation could be taken. The range of mitigation proposed should not be finite. The potential for provision of bat roosts is referred to. Reference is also made to the potential for off-site mitigation on, for example, the ‘linear land’.

London Wildlife Trust

14.3.10 The London Wildlife Trust responded to "Principles for a Human City" (letter of 3 April 2003), commenting on the unique sustainable development opportunities offered by Kings Cross Central. The Trust also commented that it considered the 2001 ‘Principles’ document to underestimate the potential for enhancement of the natural environment. Consultations have continued with the Trust on a range of topics including the integration of Camley Street Natural Park with the Kings Cross Central development and the design and procurement of a new Camley Street Visitor Centre.

14.3.11 The Trust has subsequently responded to “A Framework for Regeneration”. The Trust considered the proposals to be both imaginative and exciting but were concerned at the possible threats to Camley Street Natural Park from the much larger numbers of people who would be living, working in, or visiting the area once the development was complete. Particular issues referred to by the Trust were:

1) Impact of the development on Camley Street Natural Park.

   The proposals appeared to the Trust to indicate a lack of new green open space within the development area. Camley Street could not provide for recreational use by high numbers of visitors. Additional green open space should be provided.

2) Proposed new pedestrian bridge across the Regent’s Canal to Camley Street Natural Park.

   Such a bridge should not connect directly with the park which has opening and closing hours and should not be considered as part of the accessible public realm.

3) Possible extension to the Park;

   The Trust would like to see an extension to the park seriously considered.
4) Impact of the development on the Regent’s Canal;

The existing ecological value of the canal must be maintained, and ideally opportunities taken as part of the development to enhance its ecological value.

5) The contribution that development could make to biodiversity in the King’s Cross Area

The development could provide benefits to wildlife of national, regional and local importance. A strong network of open spaces is an essential requirement of the development. Appropriate design of the new built and unbuilt environment could provide the framework for improving existing ecological value. For example, the provision of a network of brown or rubble/locally sourced aggregate roofs within the development could provide suitable habitat for black redstarts. The potential for an ‘Eden-project’ type facility in the old gas holders was stated to be of particular interest.

6) Environmental Impact Assessment

Wildlife/nature conservation should be included as a topic. As well as statutory protected species, priority species and habitats of the UK, Greater London and Camden BAPs should be considered. More recent historical value should be considered as well as the current baseline when identifying potential mitigation for loss.

7) Offer of help to build a new visitor centre and education centre at the Park.

The Trust welcomed the Applicants’ commitment to help with developing and implementing its plans for a new visitor centre.

14.4 The Existing Situation

14.4.1 The existing situation is described on the basis of information provided by consultees, review of previous reports, and survey information. The locations of sites of nature conservation importance within the study area are shown in Figure 14.1.

Information provided by Consultees

14.4.2 The following information was provided by consultees:

*English Nature*

14.4.3 English Nature advised that Camley Street Natural Park and Barnsbury Wood (in Islington, some 500m east of King’s Cross Central) are both statutory Local Nature Reserves (LNR). They also advised that the general area contains habitat which is likely to support a wide range of species including protected species such as bats, reptiles and amphibians, and some bird species.

*Environment Agency*

14.4.4 The Environment Agency provided information on chemical and biological water quality for the Regent’s Canal. The biological data indicated a restricted invertebrate community of low diversity.
14.4.5 The Authority was not able to provide information regarding nature conservation.

14.4.6 British Waterways were consulted on general ecological and fisheries data for the Regent’s Canal. British Waterways has prepared the *King’s Cross Canal Action Plan* (August 2000) on behalf of the King’s Cross Partnership. This summarises the results of an ecological survey of the canal carried out by the London Ecology Unit in 1998. It explains that the fish community is dominated by roach and bream. Other species present include crucian and common carp, chub, dace, eel, gudgeon, perch, pike, rudd and stickleback.

14.4.7 The invertebrate fauna is described as impoverished, possibly explained by the absence of aquatic plants and the shortage of suitable canalside terrestrial habitats for species such as damselflies. Possible reasons for the lack of vegetation and impoverished fauna are stated to be:

- Water pollution
- Effects of powered boats
- Effects of waterbirds and fish
- "Historic" pollution

14.4.8 Scrubby habitat associated with the canal is stated to support small birds such as blue tit, blackbird, robin and wren. Coot, moorhen, mallard and Canada goose use the water itself and terrestrial habitats. Other species referred to are pied and, occasionally, grey wagtails, heron, black headed gulls, common terns and house martins (in summer), and occasional kingfishers flying past Camley Street Natural Park.

14.4.9 In addition to the statutory Local Nature Reserve designations identified by English Nature, the London Wildlife Trust identified Camley Street Natural Park and the Regent’s Canal as Sites of Metropolitan Importance for nature conservation. They also identified the following:

- Sites of Borough Importance Grade 1:
  - North London Link and Kings Cross Goods Yard
  - Railside Land in Islington
  - Barnsbury Wood

- Sites of Borough Importance Grade 2:
  - Caledonian Road and Market Row Garden
  - Freightliners Farm

- Sites of Local Importance:
  - Nine listed. Only one of these is near to the project area (Bingfield Park, Islington, to the north-east).
British Trust for Ornithology

14.4.10 The Trust provided data for breeding and wintering birds for the 10km squares TQ28 and TQ38 within which the site lies. In the case of breeding birds the data was provided on a tetrad (2km square) basis. A range of birds typical of urban areas was recorded. Birds of conservation concern recorded from the tetrads within which the site lies were song thrush (UK Biodiversity Action Plan priority species), starling and house sparrow (both Red-list species).

14.4.11 The wintering bird data was on a 10km square basis only and thus covers most of central London. The information provided is thus not sufficiently localised to be of any great value in the context of this assessment.

London Bat Group

14.4.12 The Group provided records of bats in the King's Cross area for the period 1985 to 1999. The only species identified was pipistrelle from the Regent’s Canal and Camley Street Natural Park.

London Natural History Society

14.4.13 A response on behalf of the London Natural History Society provided records of amphibians, reptiles and mammals for the King’s Cross area. The only reptile recorded from the area was red-eared terrapin, a non-native species, at Camley Street Natural Park. Mammals recorded in the immediate vicinity of King’s Cross Central were pipistrelle bat, house mouse, common rat and fox, with hedgehog and grey squirrel in the wider area.

Review of Reports

14.4.14 This section summarises the relevant information from reports prepared in connection with the Channel Tunnel Rail Link project. These reports were prepared prior to the commencement of the CTRL works, and in some cases before the CTRL options had been determined. Many of the works (and therefore the effects referred to) have now taken place.

Assessment of Ecological Effects (Cobham Resource Consultants, Nov 1994)

14.4.15 This included a section on the London Terminus which referred to two designated Sites of Metropolitan Importance for nature conservation in the vicinity; the Grand Union Canal and Camley Street Natural Park.

14.4.16 The canal was described as an important wildlife corridor running through north central London. It was stated to support varied habitats including open water and towpath habitats, and therefore to be important as a wildlife habitat in its own right, as well as a corridor for movement.

14.4.17 Camley Street Natural Park, a statutory Local Nature Reserve, was created in the early 1980s by the former Greater London Council, working with volunteer labour, on a derelict coal yard. The park was described as a mosaic of aquatic and terrestrial habitats: ponds, marsh, reed-beds, scrub, young woodland and a wildflower meadow. The importance of the park was stated to rest, not on the rarity of the species present, but rather on its value to the local community.

14.4.18 The report also referred to the North London Link and King’s Cross Goods Yard Site of Borough Importance Grade 1, which was contiguous with the rail-side habitats of...
Copenhagen Junction in the adjoining Borough of Islington. This was described as one of the largest wasteland sites in Inner London, where large areas of wasteland are not common. Such sites were stated to be important as 'reservoirs' of wildlife.

14.4.19 The area of the disused motorail terminal to the north-west of King’s Cross Station, whilst undesignated, was considered to be of at least local importance for nature conservation.

14.4.20 The report described the effects of construction works on these sites. Some stages of work on the railway bridges north of St Pancras would require closure of the canal to boat and pedestrian traffic, although the flow of water would not be affected. Pollution would be controlled by strict compliance with the measures set out in the Construction Assumptions for Environmental Assessment for the Channel Tunnel Rail Link.

14.4.21 A 3m strip of Camley Street Natural Park would be required to accommodate road realignment and construction of a retaining structure needed to support the park. The report stated that this should be a temporary effect.

14.4.22 82% of the Goods Yard area of the North London Link and King’s Cross Goods Yard Site of Borough Importance would be lost to a main construction site and railhead. This was considered to be a significant effect.

14.4.23 The disused motorail terminal would also be lost to a temporary construction site.

14.4.24 The report also described the permanent land-take and operational effects. The new bridge across the Regents Canal would replace the existing structure. However the new bridge would block light which currently passes between the existing structures. The effect of this loss of light was not considered likely to be significant.

14.4.25 The realignment of Goods Way would result in a small permanent land-take from the south-western corner of Camley Street Natural Park (no more than 1% of the area).


14.4.26 This included a section on Ecology which stated that some 80% of the Goods Yard area of the North London Link and King’s Cross Goods Yard Site of Borough Importance for nature conservation would be temporarily lost to a main construction site and railhead. There would be temporary loss of habitat, and the disruption of construction works could lead to a further loss of wildlife.

14.4.27 The report reflects its timing in that the future use of the Goods Yard was unclear. The effect was regarded as potentially significant. Wasteland was stated to be one of the few habitats for which temporary land-take is genuinely a temporary effect as it would readily re-develop given time and suitable conditions. If the areas taken were subsequently released and allowed to regenerate naturally, the report suggested that the CTRL construction effect would be removed.
Assessment of Aquatic Effects - Final Report (Scott Wilson Kirkpatrick, Nov 1994)

14.4.28 This included a section on the assessment of effects at the St Pancras Terminal site. It described the water quality in the Regent’s Canal. Chemical and biological water quality are discussed in the Water Resources section of this Environmental Statement (section 5.7 and Part 15)

14.4.29 The report also referred to fisheries and stated that macro-invertebrate diversity in the canal was low, probably reflecting low habitat diversity. However, the canal was stated to support an excellent coarse fishery comprising bream, roach, tench, carp, pike and perch, which had recently been enhanced by culling, restocking and other management procedures. Gudgeon and stickleback were also stated to be present. One of the species of North American crayfish occurred in the canal.


14.4.30 This is a report of the findings of a bird survey and a botanical habitat survey, carried out in 1993, the objective of which was to gain a better understanding of the wildlife interest of the area so as to be able to comment on different options for the London Terminus. The report also draws on data from consultation and review of published literature at the time.

14.4.31 The botanical survey identified a number of species which were locally rare, scarce or uncommon in Central London. These, together with comments on their status from the report, were:

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
<th>Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aster x versicolor</td>
<td>Michaelmas daisy</td>
<td>LR, Widely introduced hybrid</td>
<td></td>
</tr>
<tr>
<td>Eupatorium cannabinum</td>
<td>Hemp agrimony</td>
<td>UCL</td>
<td></td>
</tr>
<tr>
<td>Origanum vulgare</td>
<td>Marjoram</td>
<td>UCL, Probably a garden herb</td>
<td></td>
</tr>
<tr>
<td>Picris hieracioides</td>
<td>Hawkweed oxtongue</td>
<td>UCL</td>
<td></td>
</tr>
<tr>
<td>Plantago coronopus</td>
<td>Buck’s-horn plantain</td>
<td>UCL, Abundant in gravelly ground throughout the London area, but not common in Camden.</td>
<td></td>
</tr>
<tr>
<td>Viola spp</td>
<td>Violet</td>
<td>UCL</td>
<td></td>
</tr>
<tr>
<td>Vulpia myuros</td>
<td>Rat’s tail fescue</td>
<td>UCL</td>
<td></td>
</tr>
</tbody>
</table>

LR Locally Rare
UCL Uncommon in Central London

14.4.32 The mixture of habitats associated with the Regent’s Canal was stated to be uncommon in London and allowed the survival of a wide variety of species in an otherwise inhospitable urban environment. The canal also provided an important link to open countryside making it a “vital” wildlife corridor. The goods yard and former motorail depot appeared to be of local importance for wildlife.
14.4.33 The bird survey identified two areas of interest: Camley Street Natural Park and the King's Cross Goods Yard. Camley Street Natural Park provided habitat for two distinct groups of birds. The banks of the adjoining Regent's Canal and pond within the reserve held common aquatic species such as mute swan, mallard, coot, moorhen and reed warbler. Some woodland within the park supported common "garden" species such as blackbird, song thrush, dunnock, wren and robin. Linnet and redpoll were recorded but were considered unlikely to breed. The park was stated to be known to attract small numbers of migrants in spring, autumn and winter.

14.4.34 The goods yard held a similar range of "garden" species to Camley Street Natural Park. In addition, house martins, swallows and swifts were recorded feeding over areas of scrub. Kestrels were known to feed in the area and were stated to probably breed in the gas works. Herring gulls bred and roosted on the warehouse buildings. The warehouses were known to be used as a nesting site for one (possible two) pairs of black redstarts (included in the Wildlife and Countryside Act Schedule 1). They had been recorded consistently in this area for the previous 5 years. None were recorded during the survey but they were said to be almost certainly dependant upon the goods yard for feeding.

King's Cross Central Surveys

14.4.35 The ecology and nature conservation interest of the site has been established on the basis of the desk study described above, and the ecological surveys commissioned in 2001 by the Applicants (with an additional black redstart survey in April to July 2002). A tree survey of the site was carried out in January 2004.

14.4.36 In the immediate vicinity of the site (and in part included within it), the Regent's Canal and Camley Street Natural Park are Sites of Metropolitan Importance for nature conservation. Camley Street Natural Park is also a statutory Local Nature Reserve.

14.4.37 The North London Link and King's Cross Goods Yard Site, together with adjoining Railside Land in Islington, are identified as of Borough Importance Grade 1, for their large area of 'wasteland' habitat. It should be noted that the CTRL works have resulted in the loss of much of the interest of the King's Cross Goods Yard within the King's Cross Central Main Site, and that part of the Railside Land within the Triangle Site.

14.4.38 Mammals which have been recorded in the vicinity of the site are pipistrelle bat, house mouse, common rat and fox. Other mammals recorded for the wider area are hedgehog and grey squirrel.

14.4.39 The site and its immediate environs provide habitat for a range of birds typical of urban areas, including some species of conservation concern such as song thrush, starling and house sparrow. Camley Street Natural Park in particular provides habitat for a range of bird species. Of particular note is the evidence of consistent breeding of black redstart in the Kings Cross Goods Yard.

14.4.40 The canal is of importance for its wildlife habitat and as a corridor for wildlife movement. Roach and bream are the dominant fish species in the canal. Other species present include crucian and common carp, chub, dace, eel, gudgeon, perch, pike, rudd and stickleback.
14.4.41 The key findings of surveys conducted in 2001 were as follows:

**Phase 1 Habitat Survey**

14.4.42 The report of the Phase 1 Habitat Survey is attached at Appendix 14A. The vegetation within the site was found to be generally of a ruderal nature, comprising species typical of wasteland and the shallow soils of urban environments. Much of the site had already been cleared in the early stages of construction of the Channel Tunnel Rail Link. Japanese knotweed was present and would require appropriate treatment during site clearance/construction works.

14.4.43 Other than Camley Street Natural Park, which contained a variety of habitats and a diversity of species, the vegetation was generally of low nature conservation interest. A small conservation area north of Goods Way contained a diverse range of species associated with a pond and surrounding shrubs and trees. Fringed water lily *Nymphaoides peltata* (nationally scarce) was present in a pond in this area. This species is commonly planted in ponds for amenity, as was almost certainly the case in this instance, and its presence was therefore of negligible nature conservation interest.

**Breeding Bird Survey**

14.4.44 The report of the breeding bird survey carried out in 2001 is attached at Appendix 14B. One pair of black redstarts was confirmed breeding within the Exel Logistics depot with an additional male in the south of the site. The black redstart is a rare breeding bird in the UK and is afforded specific protection under the Wildlife and Countryside Act 1981. With the exception of black redstart, King’s Cross is an area of limited value for breeding birds.

14.4.45 A total of 22 species were recorded breeding together with a further 17 probably non-breeding species. The list of bird species of conservation concern has been revised since the bird survey was carried out in 2001. Eight species which are now considered to be of conservation concern (in addition to black redstart) were recorded (Table 14.2).

**Table 14.2 Numbers of pairs/territories of breeding birds of conservation concern April-June 2001**

<table>
<thead>
<tr>
<th>Species</th>
<th>Estimated number of territories/breeding pairs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camley Street Natural Park</td>
<td>Remainder of King’s Cross Central</td>
<td></td>
</tr>
<tr>
<td>Black redstart</td>
<td>1 confirmed plus 1 possible</td>
<td>Wildlife and Countryside Act 1981 Schedule 1 Amber list</td>
</tr>
<tr>
<td>Starling</td>
<td>10</td>
<td>Red List</td>
</tr>
<tr>
<td>House sparrow</td>
<td>4</td>
<td>Red list</td>
</tr>
<tr>
<td>Linnet</td>
<td>1</td>
<td>Red list</td>
</tr>
<tr>
<td>Lesser black-backed gull</td>
<td>5</td>
<td>Amber list</td>
</tr>
<tr>
<td>Herring gull</td>
<td>1</td>
<td>Amber list</td>
</tr>
<tr>
<td>Stock dove</td>
<td>present</td>
<td>Amber list</td>
</tr>
<tr>
<td>Dunnock</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Blackbird</td>
<td>3</td>
<td>11</td>
</tr>
</tbody>
</table>
A further survey for black redstart was carried out in 2002. The report of this survey is attached at Appendix 14C. A single singing male black redstart was recorded in the Exel Logistics depot on the first of 5 visits on April 17th. There were no further sightings of this or other black redstarts on further visits. This level of sightings indicates possible breeding.

Thus unlike 2001, breeding was not confirmed in 2002. It is possible that the major construction works and physical changes which had occurred to the site as a whole as a result of the Channel Tunnel Rail Link Works had rendered it less suitable for breeding, at least temporarily. The area where breeding was previously confirmed had not itself changed, but disturbance around the periphery of this area had increased substantially.

Amphibian Survey

The report of the Amphibian Survey is attached at Appendix 14D. Smooth newts were recorded from ponds in Camley Street Natural Park and in other ponds on land to the east at Goods Way. Common frog and common toad were recorded from Camley Street Natural Park. These are all common and widespread species which are afforded partial legal protection under the Wildlife and Countryside Act 1981. No great crested newts were recorded.

At the time of the survey, amphibians were being removed from the ponds at Goods Way prior to the Channel Tunnel Rail Link construction works which were likely to destroy these ponds.

Reptile Survey

The report of the reptile survey is attached at Appendix 14E. Surveys were carried out in two areas considered to represent potential, though sub-optimal, habitat for reptiles. These were in the conservation area at Goods Way, and within the railway lands in the north of the site.

No reptiles were recorded. The only reptile known to occur in the immediate area is red-eared terrapin at Camley Street Natural Park. This is a non-native species that is often introduced into waterbodies through discarding of unwanted pets.

Smooth newts were recorded during the reptile survey at the Goods Way site.

Bat Survey

The report of the bat survey is attached at Appendix 14F. Single common pipistrelle bats were recorded on each of four survey nights foraging at Camley Street Natural Park, along the Regents Canal, and at the Goods Depot.

Given the very low numbers of bats recorded within 1 hour of dusk, when most bats emerge from their roosts, there was no indication that any substantial colony of bats was present within the site or its immediate vicinity.

The survey area was concluded to be of very limited value for bats, with only the canal and vegetated areas at Camley Street Natural Park being of any value for foraging. Thus no detailed survey of structures and buildings which could potentially provide roost sites for bats was considered necessary.
Terrestrial Invertebrate Survey

14.4.56 The report of the invertebrate appraisal is attached at Appendix 14G. Within the study area, three locations were considered to be of potential invertebrate interest. These were the Camley Street Natural Park, an area of ruderal vegetation between railway lines to the east of York Way, and sites on the banks of the Regent’s Canal.

14.4.57 Two Nationally Notable (a) species; a solitary bee *Hylaeus cornutus* and a solitary wasp *Crossocerus distinguendus* were recorded from the area of ruderal vegetation to the east of York Way (the Triangle Site). Neither species was thought likely to breed there. The only potential breeding site in the local area was considered to be Camley Street Natural Park. Both species were recorded there, together with a Nationally Notable hoverfly *Pipizella virens*. The same area of ruderal vegetation also supported three Nationally Notable (b) species of beetle; *Longitarsus parvulus*, *Podagrica fuscicornis* and *Hippodamia variegata*, which were not found elsewhere on the site.

14.4.58 The canal bank was poor in invertebrate species, although in comparison with surrounding habitats it was of some interest. Camley Street Natural Park produced the longest list of invertebrates (160 species) although few of these were of particular nature conservation interest other than those referred to above. This may reflect the largely artificial and imported nature of the vegetation, and the site’s isolation.

Aquatic plants, habitats and invertebrates

14.4.59 The report of the aquatic plants, habitats and invertebrate survey is attached at Appendix 14H. The survey encompassed ponds at Camley Street Natural Park, Goods Way and the Regent’s Canal.

14.4.60 The pond within Camley Street Natural Park supported a diverse range of aquatic, emergent and marginal plant species. The vegetation included galingale *Cyperus longus* which is nationally scarce, but, along with other species such as bogbean *Menyanthes trifoliata* and white water lily *Nymphaea alba*, was almost certainly planted here. Although the pond otherwise supports generally common aquatic and emergent species, it is species-rich and of botanical interest, and provides suitable habitat for birds, amphibians and invertebrates. The aquatic invertebrates present were typical of those associated with the detritus and decomposing material found in still water and included leeches, the pea mussel *Sphaerium cornium*, chironomid larvae and the flatworm *Planaria torva*. The water hog-louse *Asellus aquaticus* and the freshwater shrimp *Gammarus pulex* occurred in large numbers. The damselfly *Coenagrion puella* was present.

14.4.61 The ponds at Goods Way contained little open water at the time of the survey. The smaller of the two ponds had filled with litter while the other had been almost completely invaded by common reed *Phragmites australis*, with some water forget-me-not *Myosotis scorpioides* and yellow flag *Iris pseudacorus*. In spite of this, the macroinvertebrate community in the larger of the ponds was as diverse as that in the Camley Street Pond and included the damselfly *Coenagrion puella* and a crayfish (probably narrow-clawed or Turkish crayfish *Astacus leptodactylus*).

14.4.62 The canal section between the York Way bridge and the Camley Street railway bridge includes the St Pancras Lock, varies in width from approximately 18m to 25m and was generally about 1.3m deep. The canal corridor is walled on both sides for much of the section with a concrete paved footpath/towpath running along the north bank. Bank side vegetation was limited although some stretches of the south bank were flanked with alder *Alnus glutinosa* and willow (including cultivated weeping willow *Salix x sepulcralis* and
osier \textit{Salix viminalis}), most notably where the canal passes by the Camley Street Natural Park. Occasional plants in cracks in the concrete footpath along the east bank included toad rush \textit{Juncus bufonius}, skullcap \textit{Scutellaria galericulata} and the invasive alien Japanese knotweed \textit{Fallopia japonica}.

14.4.63 No submerged aquatic vegetation was recorded. Emergent vegetation was very limited, as banks were man-made and generally vertical with no shelves on which vegetation could establish. There were occasional plants of branched bur-reed \textit{Sparganium erectum} on the south bank close to York Way.

14.4.64 The invertebrate community of the Regent’s Canal was impoverished, probably reflecting the lack of vegetation in the channel. None of the invertebrates recorded in the ponds or the canal was of particular nature conservation importance.

\textbf{Tree Survey}

14.4.65 The report of the tree survey carried out in January 2004 is appended to Part 9 of this Environmental Statement, the Cultural Heritage and Townscape Specialist Report. The survey was carried out to locate and assess the condition of trees at King’s Cross Central. The survey report includes a schedule of all trees recorded providing details of species, size, condition, amenity value and condition and together with plans showing their locations.

14.4.66 Some of the trees within the site are street trees of little ecological value and include mature London plane \textit{Platanus acerifolia}, close to Pancras Road in the south of the site, and recently planted trees of various species along Battlebridge Road.

14.4.67 The majority of trees within the site are within Camley Street Natural Park or associated with the Regent’s Canal. These are of a range of species, predominantly Sycamore \textit{Acer pseudoplatanus}, Crack willow \textit{Salix fragilis}, Alder \textit{Alnus glutiosa} and Ash \textit{Fraxinus excelsior}.

\textbf{Key Nature Conservation Features}

14.4.68 The key nature conservation features (comprising sites, habitats and species) which have been identified within and in the vicinity of the site, and which are relevant in the context of the King’s Cross Central proposals, are set out in Table 14.3:
### Table 14.3 Key Nature Conservation Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sites</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Camley Street Natural Park | Local Nature Reserve  
Site of Metropolitan Importance |
| Regent’s Canal | Site of Metropolitan Importance |
| North London Link and Kings Cross Goods Yard | Site of Borough Importance Grade I  (but much of the interest within King’s Cross Central lost as a result of the CTRL works) |
| Railside Land (in Islington) | Site of Borough Importance Grade I  (but much of the interest within King’s Cross Central lost as a result of the CTRL works) |
| Bingfield Park, Islington | Site of Local Importance |
| **Habitats** | |
| Wasteland | London Biodiversity Action Plan |
| Canals | London Biodiversity Action Plan |
| Canalsides and Railsides | Camden Biodiversity Action Plan |
| Waterways and Wetlands | Camden Biodiversity Action Plan |
| The Built Environment | Camden Biodiversity Action Plan |
| **Species** | |
| Common pipistrelle | EC Habitats Directive Annex IV  
Conservation (Natural Habitats, etc.) Regulations 1994 Schedule 2  
Wildlife and Countryside Act 1981 Schedule 5  
UK Biodiversity Action Plan  
London Biodiversity Action Plan  
Camden Biodiversity Action Plan |
| Black redstart | Wildlife and Countryside Act Schedule 1  
London Biodiversity Action Plan |
| House sparrow | London Biodiversity Action Plan  
Camden Biodiversity Plan  
Red list |
| Starling | Red list |
| Linnet | Red list |
| Lesser black-backed gull | Amber list |
| Herring gull | Amber list |
| Stock Dove | Amber list |
| Dunnock | Amber list |
| Blackbird | Amber list |
| Smooth newt | Wildlife and Countryside Act Schedule 5 (partial protection) |
| Common frog | Wildlife and Countryside Act Schedule 5 (partial protection) |
| Common toad | Wildlife and Countryside Act Schedule 5 (partial protection) |
| Odonata – Dragonflies and Damselflies | Camden Biodiversity Action Plan |
| Solitary bee *Hyleaeus cornutus* | Nationally Notable (a) |
| Solitary wasp *Cossocerus distinguendus* | Nationally Notable (a) |
| Hoverfly *Pipizella virens* | Nationally Notable (a) |
| Beetle *Longitarsus parvulus* | Nationally Notable (b) |
| Beetle *Podagrca fuscicornis* | Nationally Notable (b) |
| Beetle *Hippodamia variegata* | Nationally Notable (b) |
These features are described in turn below. Descriptions of designated sites are based largely on the London Ecology Unit Ecology Handbooks, Nature Conservation in Islington (LEU, 1992) and Nature Conservation in Camden (LEU, 1993).

**Designated Sites**

**Camley Street Natural Park**

Camley Street Natural Park is a Site of Metropolitan Importance for Nature Conservation and a statutory Local Nature Reserve. It was established in 1983/84 on the site of the former Plimsoll Coal Drops by the former Greater London Council and was opened in 1985. Following abolition of the GLC, ownership passed to the London Borough of Camden who lease it for a peppercorn rent to the London Wildlife Trust. Although covering only 0.8ha, the park includes a range of habitats, with both wet and dry woodland, grassland, areas of fen vegetation, and a pond. There is a visitor centre which includes a classroom, an interpretation area, a kitchen, office and toilets, and an additional meeting/activities room. The park is an important educational resource for local schools and is used for training courses for teachers, as well as being visited by students of urban nature conservation, and by the general public.

**Regent’s Canal**

The Regent’s Canal is a Site of Metropolitan Importance. It stretches from the junction with the Grand Union Canal at Little Venice in the west to the Limehouse Basin adjacent to the River Thames in the east, and was completed in 1820. The site incorporates both the open water of the canal and the adjacent towpath and supports a fauna and flora typical of inner city linear waterbodies. The canal provides opportunities for informal recreation and appreciation of wildlife in an area which otherwise lacks open water.

**North London Link and Kings Cross Goods Yard**

This is a Site of Borough Importance Grade 1 which comprises railside habitats along the North London Link together with an extensive area of the former King’s Cross Goods Yard. Abandonment of the railway goods handling and maintenance facilities within the goods yard and adjoining areas resulted in it becoming one of the largest wasteland sites in inner London. The area has been subject to various piecemeal land use changes over recent years with building material supply, bulk concrete production, and waste management operations. Much of the site is now included within the working area of the CTRL which has resulted in loss of much of its former interest as “wasteland” habitat.

**Railside Land (in Islington)**

Various sections of railside land in Islington are included in the Railside Land Site of Borough Importance Grade 1. This includes land at Copenhagen Junction, part of which falls within the Triangle Site. Copenhagen Junction comprises the sidings which served the King’s Cross Goods Yard and which contained a mixture of habitats including ‘roughland’, birch scrub, bracken stands, and sycamore woodland. This area has also been disturbed as a result of the CTRL construction works.
Bingfield Park, Islington

14.4.74 Bingfield Park consists mainly of amenity grassland and includes an adventure playground. There are dense ornamental shrubberies at the eastern end of the park which provide food and cover for common birds. The rest of the park is rather open and lacking in tree cover.

Other sites

14.4.75 There are a number of other designated sites in the area to the north-east of King’s Cross Central and which are shown on Figure 14.1. These are:

Site of Borough Importance Grade 1 and Local Nature Reserve
Barnsbury Wood

Sites of Borough Importance Grade 2
Caledonian Park and Market Road Garden
Freightliners Farm

Sites of Local Importance
St Mary Magdelene Garden
St Mary Magdelene School Rough
Thornhill Square
Barnsbury Square

14.4.76 These other sites are all 400m or more from King’s Cross Central. This, in the context of their highly urbanised settings, means that the development of King’s Cross Central is not likely to have any significant negative effects on these sites and they are not considered further in this report.

Habitats

Wasteland

14.4.77 Wasteland is a London Biodiversity Action Plan habitat. It comprises the range of habitats that develop on land whose previous use has declined or ceased. The ecological succession which develops on the varied substrates in such areas, particularly the open habitats of its early stages, can provide good habitat for reptiles and invertebrates, and foraging areas for birds such as goldfinches and linnets. The black redstart, a rare bird nationally, is particularly associated with wasteland habitats in London. Policies which encourage re-use of brownfield sites, whilst generally environmentally beneficial, are leading to a reduction in the extent of wasteland habitats.

Canals

14.4.78 Canals are a London Biodiversity Action Plan habitat which covers the artificial waterways for which British Waterways London has management responsibilities. These are the Grand Union Canal, the Regent’s Canal, the River Lea Navigation, the Hertford Union Canal and the Limehouse Cut, including the Docklands water spaces. The canal network brings linear wetlands into the heart of London, creating an important wildlife resource in a highly urban area.
**Canalsides and Railsides**

14.4.79 Canalsides and Railsides are a Camden Biodiversity Action Plan habitat. Canalsides comprises the land adjacent to the edge of the canal and the towpath, and any associate lands. Railsides refers to the land adjacent to the railway lines crossing the Borough, which has a value for wildlife.

14.4.80 The Regent’s Canal provides the canalside habitat in Camden extending for 2.75 km in the Borough. Not all of the canalside is of value as wildlife habitat as there are areas of hard landscaping. The canalside is often enclosed by high brick walls which restrict opportunities to improve areas for wildlife, but there are areas with mature trees and shrubs. The canal comprises the main green corridor through the Borough.

14.4.81 Railside habitats comprise mainly scrub and secondary woodland, other than areas which are managed as nature reserves which are more diverse. Many of the railside sites are identified as Sites of Borough Importance, including the North London Link and King’s Cross Goods Yard, as discussed above.

**Waterways and Wetlands**

14.4.82 This Camden Biodiversity Action Plan habitat covers the Regent’s Canal, ponds (from large amenity ponds to small garden ponds), and wetland habitats (such as reed beds, marsh, and wet flushes and streams).

14.4.83 The Regent’s Canal has been described above. All of the larger wetland habitats are in the north of the Borough at Hampstead Heath, Kenwood and Waterlow Park. The pond at Camley Street Natural Park is one of the few other larger ponds in the Borough and includes a reed bed.

**The Built Environment**

14.4.84 This Camden Biodiversity Action Plan habitat covers the many elements of the built environment including vertical habitats (such as walls, building exteriors and other built structures, and also balconies, fences, terraces and window boxes), roof space (both the external area as space for gardens or other habitats, and the internal space as nesting/roosting sites), streetscapes (including street trees, hedges, verges, roundabouts, and green space), school grounds, wasteland, and backlands (vegetated areas often enclosed by residential developments).

**Species**

*Common pipistrelle*

14.4.85 All UK bats are listed in Annex IV of the EC Habitats Directive and thus in Schedule 2 of the Conservation (Natural Habitats, etc.) Regulations 1994 and are subject to protection under the Regulations. They are also listed in Schedule 5 of the 1981 Wildlife & Countryside Act (as amended), and are afforded full protection under Section 9 of the Act.

14.4.86 Several bat species, including common pipistrelle, are priority species in the UK Biodiversity Action Plan. All bats are included in the London Biodiversity Action Plan and in the Camden Biodiversity Action Plan.
The Camden Biodiversity Action plan states that little is known about the current status of bats in the Borough, although it is known that bats use several sites and that there are roost sites in certain areas. Species stated to be present in the Borough, in addition to common pipistrelle, are soprano pipistrelle, noctule and Daubenton’s bat.

**Black redstart**

All breeding bird species are protected under Section 1 of the Wildlife and Countryside Act 1981. A number of bird species are afforded special protection under Section 1 and these are listed in Schedule 1 of the Act. Black redstart is listed in Schedule 1.

Black redstart is also a London Biodiversity Action Plan species.

The black redstart first colonised the UK from continental Europe in the 1940’s. Whilst its typical habitat elsewhere in Europe is rocky mountainous areas and cliffs, in the UK it is associated with industrial and wasteland sites including power stations, gasworks, industrial sites and derelict wharves. The London Biodiversity Action Plan explains that the UK population (thought to fluctuate between 80 and 120 pairs) is centered in London, the West Midlands and the Norfolk and Suffolk coast. On average 8-12 pairs breed in Greater London each year with a further 6-10 singing males.

**House sparrow**

The house sparrow is included in the London Biodiversity Action Plan and the Camden Biodiversity Plan and is a Red-list species. Red-list species are those which have undergone a 50% or more decline in UK breeding population or range over the previous 25 years, or a historical decline over the period 1800-1995, or are species of global conservation concern.

The house sparrow is particularly associated with buildings and nests in cracks and crevices and in roofs. It may also nest in climbers and creepers on walls or in dense trees and shrubberies. The house sparrow has suffered a major decline over the last ten years or so. The Camden Biodiversity Action Plan explains that there was a 50% decline in London over the period 1994-1999. The reasons for this decline are not well understood but may be related to “tidying up” of gardens and predation by cats.

**Other Red-list bird species**

Other Red-list bird species recorded breeding at the site were starling and linnet.

**Amber-list bird species**

Amber-list species are identified for several reasons, but particularly because they have undergone a 25-49% decline in the UK over the last 25 years. Other reasons are that they may be rare breeders, internationally important and localised species, and those of an unfavourable conservation status in Europe.

Amber-list species recorded breeding at the site were lesser black-backed gull, herring gull, stock dove, dunnock, and blackbird. Lesser black-backed gull and herring gull are increasingly to be found breeding in urban areas where they may result in nuisance and health risks, and consequently may require control.
Amphibians

14.4.96 Smooth newt, common frog and common toad are listed in Schedule 5 of the Wildlife and Countryside Act 1981, and are afforded partial protection under Section 9 of the Act.

Odonata – Dragonflies and Damselflies

14.4.97 The Camden Biodiversity Action Plan includes a generic plan for Dragonflies and Damselflies (Odonata). The only Odonata species recorded during the surveys was the azure damselfly Coenagrion puella, which was present in the pond at Camley Street Natural Park.

Terrestrial Invertebrates

14.4.98 Nationally Notable (a) invertebrates are those which are not Red Data Book species, but which are nonetheless uncommon in Great Britain and are thought to occur in 30 or fewer 10 km squares of the National Grid or, for less well-recorded groups, within 7 or fewer vice-counties. Those recorded from the site were the solitary bee Hylaeus cornutus, the solitary wasp Crossocerus distinguendus and the hoverfly Pipizella virens.

14.4.99 Nationally Notable (b) invertebrates are those which again do not fall within Red Data Book categories but which are nonetheless uncommon in Great Britain, and are thought to occur in between 31 and 100 10km squares of the National Grid or, for less well-recorded groups, between 8 and 20 vice-counties. Those recorded from the site were the beetles Longitarsus parvulus, Podagrica fuscicornis and Hippodamia variegata.

14.4.100 Other than Camley Street Natural Park, the main area of invertebrate interest was in the Triangle Site.

Changes subsequent to surveys

14.4.101 Most of the King’s Cross Central ecological surveys were carried out during the summer of 2001, during the early stages of site establishment and clearance for the Channel Tunnel Rail Link construction. Thus the surveys represent the position prior to any significant rail link works. Those works have continued over the two years or more since the majority of the surveys were carried out. The works have comprised demolition, site clearance, major groundworks and construction of new railway lines and associated structures, including tunnels, embankments and bridges. The works have had effects on the ecology of the site since the surveys were undertaken. However, given the continually changing conditions at the site, and the safety issues associated with surveys of construction sites, further surveys were not considered to be worthwhile nor were they necessary to identify and assess the nature conservation effects of King’s Cross Central.
14.5 Baseline 2006/7

14.5.1 The CTRL works will result in the creation of new landforms in the form of embankments adjacent to the King's Cross Central site.

14.5.2 The works are predicted to have no significant long-term effects on the Regent's Canal, or Camley Street Natural Park. On the other hand, almost the whole of the Goods Yard section of the North London Link and King's Cross Goods Yard Site of Borough Importance, together with the Copenhagen Junction section of the Railside Land Site of Borough Importance in Islington, have already been lost to the CTRL construction works.

14.5.3 The changes within these designated sites will be a reflection of changes in the habitats for which they are important i.e. wasteland and railsides. No significant changes are predicted for canals and canalsides, waterways and wetlands and the built environment within the site.

14.5.4 No changes are predicted which would affect the low level use of the site by Common pipistrelle bats.

14.5.5 One pair of black redstarts was confirmed breeding within the Exel Logistics depot in 2001, with an additional male in the south of the site. The black redstart survey carried out in 2002 suggested that whilst breeding was possible that year, and the location at which breeding was confirmed in 2001 had not in itself been affected, the increased levels of disturbance and physical change had rendered the site less suitable for this species. This may remain the case throughout the remainder of the CTRL works. However, it is possible that the species may again breed within the site and in assessing the impacts of the King's Cross Central on the basis of the worst case, it is assumed that one pair does breed at the site.

14.5.6 Use of the site by house sparrow and the other Red-list bird species starling and linnet, and the Amber-list species stock dove, dunnock and blackbird is likely to be reduced as a result of the CTRL works. Lesser black-backed gull and herring gull may continue to nest on the roof of the Granary complex.

14.5.7 The land north of Goods Way, which contained ponds supporting a population of smooth newts, has been used as part of a CTRL construction site. Newts were removed from this area and introduced to ponds elsewhere on the CTRL route, and also to Camley Street Natural Park (outside that part of the park included within the King's Cross Central site), in advance of the loss of the ponds. There is no requirement for replacement of these ponds on completion of the CTRL works. Thus the King's Cross Central site will not contain any suitable breeding ponds for smooth newts following completion of the CTRL construction.

14.5.8 No further changes which would affect amphibians at the site are predicted.

14.5.9 No changes which would affect Odonata are predicted.

14.5.10 An area of invertebrate interest in the Triangle Site has been lost as a result of the CTRL works.

14.5.11 The presence of Japanese knotweed would need to be confirmed following completion of the CTRL works and should it still be present on the site it would need to be dealt with appropriately.
14.5.12 The plan at Figure 14.2, based on CTRL completion proposals, shows the predicted baseline conditions at 2007.

14.5.13 The desk study and survey information which is summarised in this section, taking into account the changes which are predicted to 2006/2007, primarily as a result of the CTRL works, forms the baseline for the assessment of the ecological and nature conservation impacts of the King’s Cross Central proposals.

14.6 Proposals

14.6.1 As explained in Part 2.2 of this Environmental Statement, the proposed development is defined by Development Specifications for the Main Site and the Triangle Site incorporating a number of Parameter Plans. The Development Specifications define and fix the parameters of the development, and form the basis for the EIA.

Assumptions made about the Proposals in Addition to those set out in the Development Specifications

14.6.2 As explained in Part 3.3 there is commitment to a number of mitigation measures which would be implemented as part of the proposals. Those relevant to consideration of nature conservation impacts during construction are:

- Areas programmed for construction work would be cleared outside the bird breeding season (March-August inclusive) wherever practicable. If clearance during the breeding season cannot be avoided, birds would be deterred from breeding from March onwards in areas to be affected. Absence of breeding black redstarts would be confirmed by survey prior to work commencing.

- All works would be carried out taking full account of legislative requirements and Environment Agency guidance. Adequate measures would be in place with regard to handling and storage of potentially hazardous liquids, response to spillages, provisions for surface water drainage including interception of oil and sediment as explained in Part 4 ‘Construction’ of this Environmental Statement.

14.6.3 Those relevant to consideration of nature conservation impacts during the operation of the site are:

- At least 15% of the roof area of new buildings constructed within the Main Site would be green/brown roofs (or equivalent systems).

14.6.4 It is possible, although unlikely, that additional protected species may occur on the site in the future. If such species are found to occur then additional mitigation may be required to satisfy the legal requirements of the species protection provisions of the Wildlife and Countryside Act 1981 (as amended), and/or the Conservation (Natural Habitats, &c) Regulations 1994.

14.6.5 In undertaking this part of the environmental impact assessment it has been assumed that the environmental safeguards referred to in the Construction chapter at Part 4 of the Environmental Statement would be implemented effectively through the construction contracts, and that, to the extent that these measures are subject to legislation, or other regulatory control, the regulators would act competently and effectively in ensuring compliance.
In assessing any nature conservation benefits which may arise from features of the development, for example the provision of green/brown roofs and the planting proposals for the public realm, only the minimum provision set by the development specifications has been assumed.

In considering the likely baseline condition of the site in 2006/2007, it has been assumed that areas vacated by the CTRL contractors which remain temporarily unused will be managed to maintain a visually tidy appearance.

**Worst Case**

The assessment of effects is carried out on the basis of the likely ‘worst case’. The likely ‘worst case’ in this context is the development which would have the greatest adverse impact on nature conservation and which could be implemented within the limits set out in the Development Specifications, taking into account the agreed mitigation. Thus the assessment assumes that the design of the proposals would:

- Include minimum soft landscape provision shown on the Landscape Proposals Plans.
- Provide only the minimum committed “greening” in building design.
- Give rise to the maximum shading of the canal and Camley Street Natural Park by new buildings permitted by the proposed maximum building heights.

Construction could occur in a number of areas of the site at the same time over the full timescale of the development, and this represents what is likely to be the worst case in terms of potential disturbance.

**14.7 Assessment of Effects**

**Key Nature Conservation Features**

The key nature conservation features identified in the baseline studies are set out in Table 14.3.

**Potential Effects of Development**

The characteristics of the proposed development (as defined by the Development Specifications and the agreed mitigation) have been considered, and the potential for effects, negative and positive, assessed. The significance of any effects have been determined in terms of the importance/value and sensitivity of the sites, habitats and species which would be affected in a national, regional, and local context.

The following levels of significance are used in the assessment of effects in this report:

- **Major**: effects of the development of greater than local scale
- **Moderate**: effects of the development that may be judged to be important at a local scale (i.e. in the local planning context)
- **Minor**: effects that are of low importance in the decision making process

All of the above are considered to be material to a planning judgement. A further category of ‘negligible’ is used to describe effects which are of such low significance that they are not material.
14.7.5 The IEEM methodology also refers to an additional level of significance, ‘Critical’ (Table 14.1) which relates to major effects on features of international, national or, in some cases, regional importance.

14.7.6 The following terms are used to describe the time-scale of temporary impacts:

- Short-term: <12 months
- Medium term: 1–5 years
- Long term: +5 years

14.7.7 In this section of the Environmental Statement the potential impacts of the proposals on the key nature conservation features of the site are considered under three categories:

- Permanent land-take
- Construction effects
- Operational effects

14.7.8 The permanent land-take is the area taken up by the development. Whilst this occurs during the construction phase, it is a permanent effect and does not form part of the construction impacts per se which are generally temporary effects.

14.7.9 Given that the development programme would be phased over a number of years, after the first 3 years, parts of the site could be occupied and operational whilst other areas are under construction. The full programme may extend over a period of some 12-15 years or longer.

**Permanent Land-take**

14.7.10 Since the King’s Cross Central site is required to deliver a high density mixed use urban development which delivers comprehensive regeneration of much of the King’s Cross Opportunity Area, the permanent land-take essentially extends to the entire site. The extent of the site is shown on Parameter Plans KXC 001 for the Main Site and TS 001 for the Triangle Site. The principal public realm areas and the development zones within the Main Site are shown on Parameter Plans KXC 004 and 005 respectively. The Triangle Site development is defined by Parameter Plans TS004-007.

14.7.11 The only significant exception is the Regent’s Canal, part of which is included in the site to provide for the construction of bridges and to enable ecological and amenity enhancement works to be undertaken.

**Construction Effects**

14.7.12 There is a wide range of construction activities which may give rise to ecological impacts. Those relevant to the King’s Cross Central proposals include:

- Temporary offices and compounds
- Demolition works
- Storage of construction materials
- Temporary access routes within the site
- Vegetation clearance
- Soil removal
- Ground and excavation works
- Routing of services and utilities
- Assembly areas for components of construction
- Structural works and construction of buildings, structures and hard surfaces
- Construction noise
- Lighting
- Incidents and accidents (e.g. spillages and emissions)
- Removal of site offices and compounds and clearance on completion of works.

14.7.13 Given that the permanent land take would essentially extend to the full extent of the site, those construction impacts associated with land-take for the provision and removal of construction compounds, and storage of construction materials would inevitably take place within areas which would in any event be affected by the permanent land-take. Whilst there would be a difference in the timing of impacts between the temporary and permanent works, the overall impact would be the same. This also applies to the routing of services and utilities, and temporary access routes within the site. Other activities such as demolition works, vegetation clearance, soil removal and ground works and excavation would similarly take place within the area of the permanent works and would thus have no additional implications for land take. There are potential secondary construction effects such as noise and lighting associated with such operations which must be considered.

14.7.14 Thus the only effects of construction which may give rise to additional effects, and which need to be considered are the secondary effects associated with:
- Demolition works
- Vegetation clearance
- Soil removal
- Ground and excavation works
- Structural works and construction of buildings, structures and hard surfaces

14.7.15 The main such effects would be those associated with:
- Construction noise
- Lighting
- Incidents and accidents (e.g. spillages and emissions)

14.7.16 The main construction activities are those described in Part 4 of this Environmental Statement together with the noise and lighting likely to be associated with such activities.
14.7.17 The risks associated with spillages and emissions during the construction works, and the means to control such risks are also described in Part 4. Part 4 explains that measures would be taken to ensure that no significant pollution of the Regent's Canal occurs as a result of construction operations.

14.7.18 Dust generation as a result of the construction operations, and the measures to be taken to suppress such generation are also explained in Part 4. These measures, which are standard in the industry, would be expected to be generally effective in controlling dust emissions. In so far as there would be deposition of dust on vegetation, this would only be likely to occur to any significant degree in the immediate vicinity of areas such as along unsurfaced access roads. Whilst deposit of dust on leaf surfaces can reduce rates of photosynthesis, and can affect rates of gaseous exchange by blocking of stomata, effects on vegetation are only likely to occur when dust whose chemistry is different from the natural soils in an area are deposited over long periods on vegetation which is sensitive to such deposition; for example where dust from a cement works is deposited on heathland vegetation. Given the robust nature of the vegetation in the vicinity of King's Cross Central, there is no likelihood of such effects as a result of the proposed construction operations.

Operational Effects

14.7.19 These are effects which arise from the use of the development following completion of construction. In the case of King’s Cross Central they would include:

- Landscaping and vegetation management (type and location).
- Site operation and management (e.g. maintenance operations)
- Presence of people and typical uses and activities.
- Presence of pets
- Emissions
- Drainage

Impact Assessment

14.7.20 For each of the key features identified in Table 14.3, the predicted effects of permanent land-take, construction, and operation of the site, and the significance of those effects, are explained below in relation to designated sites, biodiversity action plan habitats and species.

Designated Sites

Camley Street Natural Park

14.7.21 Camley Street Natural Park is a statutory Local Nature Reserve and a non-statutory Site of Metropolitan Importance. Part of the extreme north of the park is included in the proposals (Parameter Plan KXC 001) in order to accommodate a bridge to provide a link for pedestrians and cyclists between Camley Street and the northern part of the King’s Cross Central Site.
Permanent Land-take

14.7.22 The area affected by construction of the proposed pedestrian/cycle link would be a raised grass mound surrounded by shrubs and trees (including crack willow *Salix fragilis*, aspen *Populus tremula*, alder *Alnus glutinosa*, silver birch *Betula pendula*, downy birch *Betula pubescens*, hawthorn *Crataegus monogyna*, elder *Sambucus nigra*, bramble *Rubus fruticosus agg* and Buddleia *Buddleia davidii*) between the existing visitor centre and the northern boundary of the park. The extent of loss of these trees would depend on the detailed design of the route.

Construction

14.7.23 Camley Street Natural Park is primarily of importance for its educational and interpretational value, rather than its intrinsic wildlife interest. The wildlife present is inevitably restricted by the small size, highly urban setting, and use of the site for recreation and education, to that which is tolerant of a high degree of human activity in its vicinity. In the years preceding the commencement of the King’s Cross Central development works, the wildlife present will have been subject to the disturbance associated with the removal of the gasometer structures on the neighbouring CTRL site, the realignment of Goods Way, including construction of the new retaining wall on the southern and western boundaries of the park, and the construction of the new St Pancras Station and associated railway infrastructure.

14.7.24 The King’s Cross development programme would follow on from this major construction activity and is not likely to give rise to significant additional disturbance, although the period of such disturbance would clearly be extended.

14.7.25 Many of the significant works in the vicinity of Camley Street Natural Park are likely to form part of the first major phase of the work. These include the relocation of the gas governor to development zone V; realignment and other works along Goods Way; demolition of the Western Goods Shed; the relocation of the dismantled guide frames for the linked triplet of gas holders to the North of the canal for cleaning and other refurbishment works prior to their re-erection.

14.7.26 Thus much of the construction work likely to give rise to disturbance to Camley Street Natural Park is likely to be completed early in the programme. The only remaining significant element of works in the immediate vicinity of the park, and the only element which would have direct impacts on it, would be the construction of bridge BR3 and the footpath/cycleway which, subject to agreement with the London Borough of Camden and the London Wildlife Trust, may take place as part of the second major phase.

14.7.27 Whilst there would be other construction activity in the general vicinity of the site, particularly associated with construction in development Zone B, refurbishment of the Fish and Coal Offices and other works within development zone M, re-erection of the triplet gasholder frame and other works in development Zone N, these works would be separated from Camley Street Natural Park by Goods Way or the Regent’s Canal, and given the highly urban setting of the site, would not be expected to give rise to significant disturbance of the wildlife present.
14.7.28 It is understood that a number of the core infrastructure works in the vicinity of Camley Street Natural Park are required before completion and occupation of development in Zone B (see tables at Appendix 14I). These include:

- CW9 Goodsway West: Vertical and horizontal alignment, major services diversions and installation.
- CW12 Gas Governor Site: Site Preparation
- CW26 Gas Holders: Landscape works including play area.
- CW36 Dismantle and re-erect Gasholder No 8
- CW40 Relocate Gas Governor

14.7.29 These works would thus take place relatively early in the programme, and the duration of the construction impacts would, in the main, be likely to be medium term.

Operational

14.7.30 The main potential risk to Camley Street Natural Park once King’s Cross Central is occupied is through excessive use of the site as a recreational amenity. This could result in excessive disturbance which could have adverse effects on the species present, particularly breeding birds, and could result in an unacceptable degree of damage to vegetation. Camley Street Natural Park is owned by the London Borough of Camden and is occupied/managed by the London Wildlife Trust. Thus the access arrangements to the park are determined by these organisations and can be controlled as necessary. There would be no direct access to the park from King’s Cross Central and the park is not considered to form part of the public realm of the site. The main access point would be from Camley Street as at present. The pedestrian/cycle link across the Regent’s Canal would link to Camley Street and there would be no uncontrolled access to the park from the route. Subject to the provision of a new visitor centre for the park, and its design, it is possible that the new route may provide access to this building, which would in turn provide a controlled access to the park.

14.7.31 The relocated gas governor would be located adjacent to the south west corner of the Natural Park. Wildlife in general readily habituates to the type of continuous noise which would be produced by the gas governor and, given the highly urban setting of the Natural Park, the wildlife present will already be tolerant of noise such as that associated with the railway lines to the west.

14.7.32 Parameter Plan KXC 006 shows the proposals for improvements to the Regent’s Canal. This includes new lighting of the towpath opposite Camley Street Natural Park. Security is paramount in the design of such lighting and, whilst the degree of light spillage across the canal can be limited to a degree, there would inevitably be some increase in light levels at night. The extent to which this additional light would affect the interior of the park would be significantly reduced, at least in summer, by the vegetation along the canal frontage of the park.

14.7.33 There is the potential for the buildings in the northern part of development Zone A to result in shading of Camley Street Natural Park for part of the day, particularly in the winter months. The shade which would be cast by the new buildings would have limited effects on light levels since there would still be high levels of diffuse light. It is possible that frost would lie for longer in the shaded areas on cold winter mornings, and the pond in the park may be more prone to freezing over. This is however unlikely to have significant ecological effects.
Degree and Significance of Impacts

14.7.34 Given the limited extent of the park, the permanent loss of habitat through the land take for the pedestrian/cycleway constitutes a negative impact. There would also be medium term negative impacts as a result of the construction of the pedestrian/cycle route and other construction in the vicinity of the park. In the long term, given that access to the park can be controlled by the London Borough of Camden and the London Wildlife Trust, and accepting that there is likely to be some increase in the night-time light levels, and shading, the effects of the occupied development proposals are judged to be negative.

14.7.35 Given the importance of Camley Street Natural Park in the London context, the overall significance of these impacts is considered to be moderate.

Regent's Canal

14.7.36 The proposed works to the Regent's Canal are shown on Parameter Plan KXC006. As explained at para 4.25 of the Development Specification for the Main Site, they comprise a series of proposed landscaping, towpath improvement, lighting and other works. Some of these would require the agreement of British Waterways. Also proposed are three bridges over the canal, identified on Parameter Plan KXC007 as bridges BR1, BR2 and BR3. Within Development Zone F, a new predominantly residential building with commercial uses at ground floor level would be built immediately adjacent and to the south of the canal. The maximum height of this building would be 52m AOD. The canal is at a level of approximately 21m AOD at this location and thus the building would be up to 31m above canal level. This site is currently occupied by a filling station.

Permanent Land-take

14.7.37 There may be some minor land take which would affect the canal as a result of the works proposed to the towpath. It is likely that most of the trees associated with the canal towpath would be lost as a result of the improvements, as would trees on the opposite side of the canal, with the exception of those within Camley Street Natural Park.

Construction

14.7.38 The main risk to the canal during the construction works would be from surface run-off from the working areas which could be contaminated or contain high levels of silt, and which could result in pollution of the canal. All works would be carried out taking full account of the requirements of legislation and Environment Agency guidance. Measures would be taken with regard to handling and storage of potentially hazardous liquids, response to spillages, provisions for surface water drainage including interception of oil and sediment as explained in Part 4 ‘Construction’.

14.7.39 To the extent that there is a risk of dust from adjacent construction works being deposited in the canal, measures would be implemented in order to reduce dust generation. Where necessary, hoarding would be erected to prevent dust entering the canal.
14.7.40 As is the case for the Camley Street Natural Park, in the years preceding the commencement of the King’s Cross Central development works, the wildlife of the canal will have been subject to the disturbance associated with the CTRL works, including construction of new bridges and railway lines in the west, and the construction and use of the temporary bridge providing access for the CTRL site in the central section.

14.7.41 The King’s Cross development programme would follow on from this construction activity. However, unlike the CTRL works which have been relatively localised with respect to the canal, the King’s Cross Central development would affect most of the canalside, with the exception of the canal frontage of Camley Street Natural Park. As shown on Parameter Plan KXC006, there would be improvement works to the towpath, possible construction of new moorings, and construction/provision of three new bridges.

In addition to the works within the canal corridor, there would also be effects, such as through noise and lighting, as a result of construction works in the vicinity of the canal, primarily Zones F, G, I, M, N and V (see Parameter Plan KXC005). Works associated with the provision of public realm areas particularly Granary Square and Canal Square (Parameter Plan KXC004) are also likely to result in disturbance to the canal corridor.

14.7.42 Core infrastructure works in the vicinity of the canal are required before completion and occupation of development in Zone B. These include:

- CW10 Canal Square
- CW11 Goodsway East: Vertical and horizontal realignment, (services diversions and installation)
- CW12 Gas Governor Site: Site Preparation
- CW14 Canal South Bank Works
- CW15 East Bridge: New road and pedestrian bridge incorporating major services
- CW18 Route North: Provide a commodious route from Station Square to Granary Square
- CW26 Gas Holders: Landscape works including play area.
- CW36 Dismantle and re-erect Gasholder No 8
- CW40 Relocate Gas Governor

14.7.43 These works are likely to take place relatively early in the programme. Other relevant works are required before completion and occupation of development in Zone M, the Eastern and Western Coal Drops which is proposed for the second major phase. These comprise:

- CW20: Granary Square: Regrading, refurbish existing landscape features and create new landscaping incorporating service media.

14.7.44 There are however other relevant works, the timing of which is less certain. These include:

- CW13 West Bridge
- CW19 Canal North Bank
- CW39 Camley Street Bridge
Thus whilst significant elements of the work likely to give rise to disturbance to the canal are likely to be completed early in the programme, there is the potential that disturbance to the canal could occur over prolonged periods, or would be repeated at intervals throughout the work programme.

Other than the canal frontage of Camley Street Natural Park, the section of the canal within and adjacent to the King’s Cross Central site offers little cover for breeding birds or other species which would be particularly susceptible to disturbance. Thus the effects of such construction disturbance are likely to be largely restricted to the western section of the canal.

Operational

The comprehensive redevelopment of the King’s Cross Central site would introduce large numbers of new residents, employees and visitors to the site. As at present, the canal towpath would form a route for pedestrians and cyclists. At present, the canal is largely isolated from the site by the retaining wall between the canal and Wharf Road. Access to the towpath within the site can only be gained via steps at the east end adjacent to Maiden Lane Bridge. Thus the majority of users of the towpath are passing through the area rather than accessing the site. The proposals would change this. However, it should be noted that the King’s Cross Canal Action Plan (British Waterways, 2000) also recommends improvements to the access to the canal in the area of King’s Cross Central. These include improvements to the existing access at Maiden’s Lane Bridge, together with three new access points at the locations now proposed as part of the proposals. The recommended improvements are framed in the context of redevelopment of the King’s Cross Goods Yard, so whether they would be promoted in the absence of such redevelopment is uncertain.

The King’s Cross Central proposals incorporate enhancement of the existing access point and provision of a major access from Granary Square, as well as a link from the Coal Drops Yard and from the residential area based on the relocated gasholders (Parameter Plan KXC006). New towpath lighting would be provided.

Thus there would be a major increase in the public use of the towpath, both by day and night, with a corresponding increase in the degree of disturbance of this section of the canal corridor. The degree to which this would have actual adverse effects would be limited by the lack of existing cover for wildlife, other than along the frontage of Camley Street Natural Park.

The presence of new bridges, particularly BR1 which would provide both road and pedestrian access across the canal, would result in shading of stretches of the canal which are currently not shaded. The new pedestrian/cycleway bridge would be relatively insignificant in this respect. In addition, if the new buildings proposed for Zone F and the northern parts of Zones A and B were built to the full height proposed, there would be shading of the section of canal adjacent to Maiden Lane Bridge. Heavy shading, such as that which may occur beneath bridges, may inhibit the growth of aquatic plants, and may affect the behaviour of fish. This would be to some extent off-set by the removal of the existing bridge from Goods Way across the canal. As explained above, the shade which would be cast by the new buildings would have a lesser effect than this since there would still be high levels of diffuse light. Such shading is unlikely to have any significant ecological effects although shaded parts of the canal may be more prone to freezing over in cold weather.
14.7.51 As explained in Part 15, the proposals seek to encourage more boats to moor along the canal adjacent to the site. This could result in discharges to the canal which could affect water quality. Whilst these impacts would be moderated by regulation by British Waterways, discharge of hydrocarbons may still occasionally take place. Since it is unlikely that the proposals would result in more boats overall this would be a movement of pollution rather than an overall net increase, as the boats would previously have moored elsewhere.

14.7.52 The relocated gas governor would be located adjacent to the canal. Wildlife in general readily habituates to the type of continuous noise which would be produced by the gas governor and, given the highly urban setting of the canal, the wildlife present will already be tolerant of noise.

Degree and Significance of Impacts

14.7.53 Some minor land-take within the Regent’s Canal corridor is likely, and there would be loss of trees. Thus the impact would be negative. Given that the canal runs in a constrained corridor, and that construction disturbance could potentially occur over prolonged periods and/or at intervals throughout the programme of the works, and accepting that, whilst there would be careful management of surface run-off, there would be some potential for accidental discharges to occur, the magnitude of construction effects is judged to be negative. In the long term, given that there would be a major increase in the public use of the towpath, both by day and night, and an increase in shading of the canal, and taking into the account the potential for discharges from moored boats, it is likely that there would be a negative ecological impact on the canal.

14.7.54 Although localised, given the importance of the Regent’s Canal in the London context, the overall significance of these impacts is considered to be moderate.

North London Link and King’s Cross Goods Yard

14.7.55 The extent of the North London Link and King’s Cross Goods Yard Site of Borough Importance is shown on Figure 14.1. The site is now almost entirely occupied by the CTRL works including the major earthworks associated with construction of embankments and tunnels, construction sites, storage areas for bulk excavated material and fill, and site offices and car parks. Its former value as a “wasteland” site has been destroyed. Whilst it is possible that some recovery of its interest may have occurred prior to the commencement of the King’s Cross Central development proposed for 2007, the extent of any such recovery is likely to be limited assuming that land vacated by the CTRL contractors will be managed to maintain a visually tidy appearance.

Permanent Land-take

14.7.56 In order to achieve comprehensive redevelopment of a major part of the King’s Cross Opportunity Area, the King’s Cross Central permanent land-take would encompass a major part of the North London Link and King’s Cross Goods Yard. However, this is currently of little nature conservation importance as a result of the CTRL works, and is unlikely to be of importance in 2006/2007. It could be argued that the development of King’s Cross Central would preclude the recovery of the site’s importance as “wasteland”. However, given the policy imperatives which support development, such potential is unlikely ever to be realised.
Construction

14.7.57 The site is currently subject to major disturbance and disruption as a result of the CTRL works, due for completion in 2007. Development of King’s Cross Central would continue construction activity across the site for a further 12-15 or more years.

Operational

14.7.58 Development of the site would result in its transformation from a construction site (formerly “wasteland”) to a high density mixed use urban development. The use of the site per se would not give rise to significant further impacts.

Degree and Significance of Impacts

14.7.59 Given that the value of the site has been largely destroyed by the CTRL works, the land-take, construction and operational effects of the King’s Cross Central proposals on the North London Link and King's Cross Goods Yard Site of Borough Importance are judged to be neutral.

14.7.60 Impacts on nature conservation interests would thus be of negligible significance.

Railside Land in Islington

14.7.61 The extent of the Railside Land in Islington site is shown on Figure 14.1. The area within the King’s Cross Central site is the land to the east of York Way which forms much of the Triangle Site. The area will be enlarged following the realignment of York Way to the west to pass beneath the new CTRL embankment. This area has also been affected by CTRL work as it forms the site for the entrances to the Thameslink 2000 tunnels, the CTRL embankment and the link from the Great Northern line into St Pancras.

14.7.62 Thus by 2007, it will have been subject to major construction works resulting in disruption and disturbance, and the loss of its former interest.

Permanent Land-take

14.7.63 Development of the Triangle Site is considered to be an important component of the regeneration of the King’s Cross Opportunity Area. The King’s Cross Central permanent land-take would thus encompass the Triangle Site, and hence a significant part of the Railside Land in Islington. However, the area affected will be of little nature conservation importance by 2007 as a result of the CTRL construction and associated works. It could be argued that the development of King’s Cross Central would preclude the recovery of the site’s importance as “wasteland” following completion of the CTRL. However, given the policy imperatives which support development, such potential is unlikely to be ever realised.

Construction

14.7.64 The site will have been subject to major disturbance and disruption as a result of the CTRL works, due for completion in 2007. Development of King’s Cross Central would result in further construction activity across the site.

Operational

14.7.65 Development of the site would result in its transformation from a construction site (formerly “wasteland”) to a residential, retail and leisure development. The use of the site per se would not give rise to significant further impacts.
The Development Specification for the Triangle Site explains that an area in the north east corner of the site would be developed as a 'habitat area'. Detailed design of this area would take account of the need to provide habitat which would be complementary to the adjoining railside land. It is likely that this would include vertical green walls, aggregate containers, and similar features, to provide elements of 'wasteland' habitat, commensurate with a high quality urban setting.

Degree and Significance of Impacts

Given that the value of the site has largely been destroyed by the CTRL works, the land-take, construction and operational effects of the King’s Cross Central proposals on the Railside Land in Islington Site of Borough Importance are judged to be neutral. The provision of the 'habitat area' would be a positive effect.

Taking into account the effect of the provision of a habitat area, the impact on nature conservation interests would thus be of minor positive significance.

Bingfield Park, Islington

Bingfield Park is to the east of York Way close to the Triangle Site part of King’s Cross Central.

Permanent Land-take

Bingfield Park would not be affected by land-take.

Construction

Bingfield Park would not be affected by the King’s Cross Central Construction works.

Operational

The King’s Cross Central development would include up to 2550 residential units, most of which would be within the part of the site to the north of the Regent’s Canal. Up to 250 of these would be within the Triangle Site which is the closest part of the site to Bingfield Park. There would thus be an increase in the number of residents in the vicinity of the park. The proposals include extensive areas of public realm (Parameter Plan KXC004) to provide for the recreational needs of the new residents, including the Long Park, in the north of the site. However, some of the new residents, particularly those from the Triangle Site section of the site may well use Bingfield Park. The proposals would also increase the ease of access to the park for residents of Somers Town, to the west of King’s Cross Central, which could result further increase in use, although again some of this increase would be likely to be absorbed within the King’s Cross Central site itself. Given that the park is a recreational facility in an urban setting, a moderate increase in its use is not likely to have significant nature conservation impacts.

Degree and Significance of Impacts

There would be no effects of land-take or construction on Bingfield Park. Any increase in recreational use of the park is likely to be neutral in terms of its nature conservation effects.

Impacts on nature conservation interests would thus be of negligible significance.
Biodiversity Action Plan Habitats

Wasteland

14.7.75 The main areas of “wasteland” within the Kings Cross Central site are included within the North London Link and Kings Cross Goods Yard, and Railside Land in Islington sites discussed above. There are small areas of such habitat elsewhere within the site, such as Development Zone V which would be the site for the relocated gasholder. Other areas may develop at times as the CTRL works are completed but, given that it is the intention that where possible parts of the site which had yet to be developed would be kept in active use, and assuming that areas vacated by the CTRL contractors which remain temporarily unused will be restored and reseeded, and managed to maintain a visually tidy appearance, such areas of “wasteland” are likely to be limited in extent and it is unlikely that any extensive areas will exist by 2007.

Permanent Land-take

14.7.76 Any “wasteland” areas which do exist in 2007 would be developed as the King’s Cross Central construction continues. Other small areas would continue to develop and be lost as the development programme continues. Such cyclical creation and loss is characteristic of such habitat. However, on completion, such sites would have been developed in order to achieve the policy imperatives for high density urban development across the sites. Rather than loss of any individual areas the main effect would be to end the process of cyclical creation and loss of such habitat within an area within which this has been a feature historically.

Construction

14.7.77 As explained above, “wasteland” habitats may develop and be lost in parts of the site as construction continues. Any such sites are likely to be subject to a relatively high degree of disturbance as a result of construction works or use of occupied areas of the site. Many of the species characteristic of such sites, such as plants and invertebrates are not sensitive to disturbance, and although limited in extent such sites may not be entirely lacking in interest. One important species of such habitats, the black redstart, is also relatively tolerant of human activity.

Operational

14.7.78 Development of the site would result in its transformation to a high density mixed use urban development. The use of the site per se would not give rise to significant further impacts on “wasteland” habitats. As explained above, a ‘habitat area’ would be developed within the Triangle Site which is likely to include elements of wasteland habitat.
**Degree and Significance of Impacts**

14.7.79 The nature conservation effects of permanent land-take and construction on “wasteland” are likely to be negative. The subsequent effects of occupation and use of the site are likely to be neutral. Whilst the ‘habitat area’ in the Triangle Site would be of minor positive significance in the context of the Railside Land in Islington Site of Borough Importance, in the broader context of wasteland habitat, the limited extent of the area means that its effect would be neutral. Similarly, the provision of green/brown roofs, whilst being effective in providing a degree of mitigation for some of the adverse effects of the proposals, would not be of significant benefit in the overall context of wasteland habitat.

**Canals**

14.7.80 The effects on the “Canals” London Biodiversity Action Plan habitat would be as set out for the Regent’s Canal above. The overall significance of the negative impacts is considered to be moderate.

**Canalsides and Railsides**

14.7.81 The effects of the King’s Cross Central proposals on existing canalside habitats have been discussed in the context of the Regent’s Canal above. Similarly the effects on railside land have been discussed in the context of the North London Link and Kings Cross Goods Yard, and Railside Land in Islington sites. When CTRL is complete the northern boundary of the King’s Cross Central site will adjoin some 400m of new rail side land associated with the CTRL.

**Permanent Land-take**

14.7.82 As explained, there would be some permanent land-take within the canal corridor. The effects of permanent land-take affecting railside land are discussed in the context of the Railside land in Islington.

**Construction**

14.7.83 Similarly construction effects on the canal corridor and existing railside land have already been discussed. It is unlikely that the new railside land associated with the CTRL will have developed any particular nature conservation interest by 2007, but such interest may subsequently develop depending on the future management of this land and the boundary with King’s Cross Central.

**Operational**

14.7.84 The effects of use of the site on the canal corridor and existing railside land are discussed in the context of the Regent’s Canal and the Railside Land in Islington above. The degree to which the new railside land alongside the CTRL may develop any ecological interest depends on the future management of this land and the boundary with King’s Cross Central. Development of such interest may to some extent be limited by the occupation and use of Development Zone T.
Degree and Significance of Impacts

14.7.85 There would be some land-take of canalside or railside habitats as a result of the proposals. There would be disturbance of the Regent’s Canal corridor during construction and subsequent operation and use of the site. There is also some potential for disturbance of new CTRL railside land during construction and subsequent operation of the site. These are judged to be negative impacts.

14.7.86 The overall impacts on canalside and railside habitats are judged to be of moderate significance.

Waterways and Wetlands

14.7.87 The waterways and wetlands within or in the vicinity of the site comprise the Regent’s Canal and the ponds within Camley Street Natural Park. The impacts on nature conservation in these areas have been considered above.

Permanent Land-take

14.7.88 There would be minor land-take affecting the canal but the ponds would be unaffected.

Construction

14.7.89 Construction impacts on Camley Street Natural Park are explained above. In that the ponds are within the site, they would be screened from the effects of construction to a considerable degree. The effects of construction on the canal are also discussed above. There is the potential that disturbance to the canal could occur over prolonged periods, or would be repeated at intervals throughout the work programme.

Operational

14.7.90 Camley Street Natural Park is owned by the London Borough of Camden and is occupied/managed by the London Wildlife Trust. Thus the access arrangements to the park, and thus to the ponds, are determined by these organisations and can be controlled as necessary.

14.7.91 As explained above there would be a major increase in the public use of the towpath, with a corresponding increase in the degree of disturbance of this section of the canal. The presence of new bridges, particularly BR1, would result in shading of stretches of the canal which are currently not shaded. In addition, if the new building, or buildings, proposed for Zone F were built to the full height proposed, there would be shading of the section of canal adjacent to Maiden Lane Bridge, which would combine with the shading from the bridge itself to form a relatively extensive shaded area. This would be to some extent off-set by the removal of the existing bridge from Goods Way across the canal.

Degree and Significance of Impacts

14.7.92 No permanent land-take would affect the ponds but there would be some minor effect on the Regent’s Canal, thus the impact would be negative. In the case of the ponds there is no likelihood of significant adverse effects during construction or operation of King’s Cross Central.
As explained above, given that the canal runs in a constrained corridor, and that construction disturbance could potentially occur over prolonged periods and/or at intervals throughout the programme of the works, and accepting that, whilst there would be careful management of surface run-off, there would be some potential for accidental discharges to occur, the magnitude of construction effects is judged to be negative. In the long term, given that there would be a major increase in the public use of the towpath, and an increase in shading of the canal, there would be a negative ecological impact on the canal.

Given the importance of the Regent's Canal in the London context, the overall significance of these impacts is considered to be moderate.

The Built Environment

The King’s Cross Central development would result in significant changes to the built environment of the site. As explained in Part 9 of this Environmental Statement, whilst the design of the proposals has endeavoured to retain as many of the heritage buildings, structures and surfaces as practicable, there would be some losses of such buildings and features. Where such buildings and features are retained they will require repair and refurbishment.

The comprehensive redevelopment of the site means that there would be many new buildings and extensive areas of public realm.

In so far as the built environment includes wasteland habitats, the effects have been discussed above. In so far as it may provide habitat for black redstart and other breeding birds, and bats, these are considered below.

Permanent Land-take

The effects of permanent land-take on “wasteland” has been considered above. Parameter Plan KXC011 shows the demolition and restoration proposals for Listed Buildings, and for buildings in Conservation Areas. Parameter Plan KXC010 shows those building groups and structures which are the subject of initial Conservation Plans. Thus some elements of the existing built environment would be demolished, and those significant features which are to be retained would be refurbished. Many new buildings would be constructed across the site as development proceeds. Species of note recorded from the site which are particularly associated with the built environment are black redstart (considered below), house sparrow and starling (also considered below), and herring gull and lesser black headed gull, amber list species which nest on the roof of the Granary complex.

Construction

Implementation of the construction programme involving the demolition of some, and works to other, existing buildings, and construction of new buildings, would change the nature of the built environment from one where construction is largely of stone, brick, tile and similar natural materials, to one where synthetic materials or natural materials which have been subject to a high degree of processing predominate.
Operational

14.7.100 The retained existing buildings would be subject to a greater degree of maintenance than has historically been the case. The new buildings would be expected to be constructed of materials which afford less opportunity for colonisation by plants and other species, and to afford less opportunities for birds to nest or roost. The more intensive use of the site which would result from its redevelopment would be expected to result in additional disturbance of wildlife. The provision of green/brown roofs on a minimum of 15% of the new buildings within the Main Site would provide some mitigation.

Degree and Significance of Impacts

14.7.101 Given the nature of the existing built environment at King’s Cross and the extensive redevelopment which would take place, and that the nature of the redeveloped site is likely to provide less opportunities for wildlife, notwithstanding the provision of green/brown roofs, the effects of land-take, construction and operation are considered to be negative.

14.7.102 The habitat is considered to be of Borough importance and the significance of the effects is judged to be moderate.

Species

Common pipistrelle

14.7.103 On each of four survey visits, single pipistrelle bats were recorded along the Regent’s Canal and at the Goods depot. This is also the only bat species referred to in London Bat Group records from the area. Whilst buildings and structures at the site provide potential bat roosts there is no evidence that such roosts exist. Only the Regent’s Canal and Camley Street Natural Park are of any particular value for foraging bats.

Permanent Land-take

14.7.104 The only area of particular value for bats is the canal and Camley Street Natural Park, and the only relevant land-take would arise from construction of the pedestrian and cycleway leading to Bridge BR1.

Construction

14.7.105 As explained above, there would be some disturbance of the canal and Camley Street Natural Park as a result of the construction works. However, given that night time working would only occur under exceptional circumstances, significant effects on foraging bats would not be expected.

Operational

14.7.106 As explained above, the proposals include improved lighting of the canal towpath. Whilst some species of bat are deterred by lights, pipistrelles typically take advantage of the concentrations of insects around such lights and are unlikely to be adversely affected.
Degree and Significance of Impacts

14.7.107 Given the low numbers and location of bats recorded at the site and that construction and use of the site are unlikely to have adverse effects, the land-take, construction and operational effects of the proposals are all judged to be neutral with respect to bats. Thus the significance of the effects on bats is judged to be negligible.

Black redstart

14.7.108 There is a history of black redstarts breeding in the area, and breeding was confirmed in the Goods Yard in the 2001 survey. A single bird was recorded in 2002 but breeding was not confirmed.

Permanent Land-take

14.7.109 The effects of land-take on black redstart follow from the loss of wasteland habitat and the changes to the built environment are discussed above. Whilst the CTRL works have already resulted in the loss of wasteland habitats over much of the site, the effects of the King’s Cross proposals would be to end the process of cyclical creation and loss of such habitat within an area within this has been a feature historically. The value of the site for black redstart would thus be reduced in the future.

Construction

14.7.110 Whilst black redstart is relatively tolerant of human activity, the high levels associated with an active development site would be likely to deter potential breeding birds. Areas of the site which are not being developed may be suitable depending on the nature of any interim uses. Assuming that any extensive areas of the site vacated by the CTRL contractors which remain vacant will be restored, reseeded and managed to maintain a tidy visual appearance, such areas are unlikely to be of value to black redstarts.

Operational

14.7.111 The full development of the site as a high density mixed use development would represent poor habitat for black redstart. However, a minimum of 15% of the new buildings within the Main Site would have green/brown roofs. The use of such roofs has, in the UK, been promoted specifically to provide habitat for “wasteland species” which would otherwise be displaced by development. The black redstart, because of its rarity, and particular requirement for such habitat, has been the focus of much of the concern, and for the need to provide alternative habitat.

Degree and Significance of Impacts

14.7.112 Taking into account the history of the site for breeding black redstart, its rarity in the UK and its protected status, the effects of permanent loss of wasteland habitat, and disturbance during construction and operation of the site, all of which are judged to be negative with respect to black redstart, and that these effects would be to a degree offset by the provision of green/brown roofs on a minimum of 15% of the new buildings within the Main Site, the significance of the negative effects is judged to be moderate.
Red-list bird species

14.7.113 Red-list species recorded breeding from the site in 2001 were house sparrow (4 pairs), starling (10 pairs) and linnet (1 pair). House sparrow is also a London Biodiversity Action Plan and Camden Biodiversity Action Plan species. House sparrow and starling are characteristic of urban areas. Linnets are characteristic of open habitats with vegetation providing good seed crops.

Permanent Land-take

14.7.114 The land-take effects are essentially those for wasteland and built environment habitats set out above. The changes to such habitats are likely to result in loss of feeding and nesting opportunities for these species.

Construction

14.7.115 Sparrow and starling are relatively tolerant of human activity. However the high levels associated with an active development site would be likely to deter potential breeding birds. Areas of the site which are not being developed may be suitable depending on the nature of any interim uses.

Operational

14.7.116 The full development of the site as a high density mixed use development is likely to present poor nesting habitat for house sparrow and starling, and would probably preclude linnet. However, the likely increase in public use, particularly the potential for open air cafés and similar eating places may present feeding opportunities for house sparrow and starling.

Degree and Significance of Impacts

14.7.117 The effects of land-take, construction and operation off the site are all judged to be negative, and the overall significance of those effects to be minor.

Amber list bird species

14.7.118 Amber-list species recorded breeding at the site were lesser black-backed gull, herring gull, stock dove, dunnock, and blackbird. The effects of land-take, construction and long term use of the site are likely to be similar to those for the red-list bird species.

14.7.119 Thus, the effects of land-take, construction and operation off the site are all judged to be negative. The overall significance of those effects is assessed as minor. It should be noted, as explained above, that lesser black-backed gull and herring gull are increasingly to be found breeding in urban areas where they may result in nuisance and health risks, and consequently may require control.

Amphibians

14.7.120 Amphibians recorded from the site were smooth newt, common frog and common toad. Amphibians were only recorded from the ponds at Goods Way, subsequently destroyed by the CTRL works, and Camley Street Natural Park.

Permanent Land-take

14.7.121 Since the Goods Way ponds have been destroyed by the CTRL works, there would be no land-take effects on the remaining amphibian habitat.
Construction

14.7.122 The construction works are unlikely to have any adverse effects on the amphibian populations. The only risk during construction would be if pollution entered the canal and in turn reached the ponds which are directly linked to the canal. As explained above measures would be implemented throughout construction to prevent such pollution occurring.

Operational

14.7.123 The occupation and use of the site is unlikely to have any adverse effects on the amphibian populations. The conservation of these populations depends on the management of Camley Street Natural Park.

Degree and Significance of Impacts

14.7.124 The land-take, construction and operational effects of the proposals are considered to be neutral with respect to amphibians, and the overall significance of the effects to be negligible.

Odonata – Dragonflies and Damselflies

14.7.125 The only species of Odonata recorded was the azure damselfly Coenagrion puella at the ponds at Camley Street Natural Park.

Permanent Land-take

14.7.126 The ponds are outside the application site and would not be affected by the proposals.

Construction

14.7.127 The only risk during construction would be if pollution entered the canal and in turn reached the ponds which are directly linked to the canal. As explained above measures would be implemented throughout construction to prevent such pollution occurring.

Operational

14.7.128 The occupation and use of the site is unlikely to have any adverse effects on the ponds and thus the damselfly population. The conservation of the population depends on the management of Camley Street Natural Park.

Degree and Significance of Impacts

14.7.129 The land-take, construction and operational effects of the proposals are considered to be neutral with respect to Odonata, and the overall significance of the effects to be negligible.
Terrestrial invertebrates

14.7.130 Two Nationally Notable (a) invertebrates (a solitary bee *Hylaeus cornutus*, and a solitary wasp *Crossocerus distinguendus*) were recorded in ruderal vegetation in the Triangle Site. They were also recorded from Camley Street Natural Park, the likely breeding site. The Nationally Notable hoverfly *Pipiza virens* was also recorded from the park. Three Nationally Notable (b) beetles (*Longitarsus parvulus, Podagrica fuscicornis* and *Hippodamia variegata*) were also recorded from the Triangle Site.

Permanent Land-take

14.7.131 As explained above, there would be some minor land-take within Camley Street Natural Park as a result of the construction of a pedestrian and cycleway link across the canal. Construction within the Triangle Site would affect land within the Railside Land in Islington Site of Borough Importance, although the interest of his area has been largely destroyed by the CTRL works.

14.7.132 In so far as “wasteland” habitats are important for invertebrates, as explained above, any “wasteland” areas which do exist in 2006/2007 would be destroyed as the King’s Cross Central construction continues. Other areas would continue to be created and be lost as the development programme continues. However, on completion, such sites would have been developed in order to achieve the policy imperatives for high density urban development across the site. Rather than loss of any individual areas the main effect would be to end the process of cyclical creation and loss of such habitat within an area within which this has been a feature historically.

Construction

14.7.133 As explained above, “wasteland” habitats may be created and be lost in parts of the site as construction continues and these may provide areas of temporary habitat for invertebrates. Invertebrates would not be sensitive to the relatively high levels of disturbance which may affect such sites.

Operational

14.7.134 Development of the site would result in its transformation to a high density mixed use urban development. The use of the site *per se* would not give rise to significant further adverse impacts on invertebrates. The provision of green/brown roofs on a minimum of 15% of the area of new buildings within the Main Site would be of benefit to “wasteland” invertebrates.

Degree and Significance of Impacts

14.7.135 The nature conservation effects of permanent land-take and construction on terrestrial invertebrates are likely to be negative. The provision of green/brown roofs on a minimum of 15% of the roof area of new buildings within the Main Site means that the effects of occupation and use of the site are likely to be positive. Overall the effects on invertebrates are likely to be negative and of minor significance.

Summary of identified nature conservation impacts

14.7.136 Table 14.4 below summarises the nature conservation impacts which have been described in detail above. It must be appreciated that there is considerable overlap between the various interest features described and thus the same impacts are often repeated through the table. For example the Regent’s Canal is a Site of Metropolitan Importance which
also includes ‘Canals’, ‘Canalsides and Railsides’ and ‘Waterways and Wetlands’ Biodiversity Action Plan habitats. Similarly the North London Link and King’s Cross Goods Yard Site of Borough Importance also includes ‘Wasteland’ and ‘Canalsides and Railsides’ Biodiversity Action Plan habitats, which in turn provide habitats for black redstart and terrestrial invertebrates. Thus the same impacts are reported for several different features.

Table 14.4 Summary of identified likely nature conservation impacts

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value of Feature</th>
<th>Impact Magnitude</th>
<th>Overall Impact Magnitude</th>
<th>Significance of Impact</th>
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<tbody>
<tr>
<td>Sites</td>
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<tr>
<td>Camley Street Natural Park</td>
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<td><strong>Construction:</strong> Negative</td>
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<td></td>
<td></td>
<td><strong>Operational:</strong> Negative</td>
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<td>Borough</td>
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<td><strong>Operational:</strong> Neutral</td>
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14.7.137 Although a number of individual impacts of the proposals have been identified and are set out in the table, in reality the main effects largely arise from the inevitable land take of the proposals resulting in loss of “wasteland” habitats with consequent effects on species associated with such habitats.

14.7.138 There would be negative impacts of moderate nature conservation significance on Camley Street Natural Park partly as a result of direct impacts of construction of the new pedestrian and cycleway, but primarily as a result of disturbance both during construction, and also the long term increased numbers of people in the area and increased night time lighting of the canal towpath opposite.

14.7.139 Similarly increased disturbance and lighting, and potential discharges form moored boats, would also affect the Regent’s Canal (and Canal habitat). Although only a relatively short section of the canal would be affected, the juxtaposition of the canal and Camley Street Natural Park enhances the canal in this area and these are assessed as negative impacts of moderate significance.

14.7.140 As indicated above, many of the other nature conservation impacts identified arise from the loss of wasteland or similar habitats and associated species. Thus there would be impacts of moderate significance on:

- Wasteland;
- Canalsides and railsides;
Sparsely-vegetated sites on nutrient-poor substrates form an important component of urban ecology in London. Such sites support an interesting flora and can support a diversity of species, particularly, at least for a few years, a wide range of invertebrates. They are scattered within the developed urban area and, whilst perhaps appearing to be physical isolated, together they form a mosaic of sites that supports meta-populations of solitary bees, solitary wasps, beetles and other invertebrates that are able to move around by flying.

In this context, no one site is particularly more important than another, and a poor quality site now may be a good quality site in the future. The nature of the sites is such that they come and go, with bare sites becoming sparsely-vegetated and passing through a succession of stages until overtaken by Buddleia, elder or other scrub. As one site is lost in this manner, or is re-developed, another is created by clearance and so the cycle continues.

Thus the loss of such habitat at Kings Cross Central would, on its own, be of no greater consequence than the loss of other local sites. However, the situation is affected not only by the rate at which sites are lost to the habitat mosaic, but also by the rate at which new ones are added. In recent years, the equation has become unbalanced, so that the loss of sites outstrips their creation and overall there is a net decline.

The effects on habitats would also affect breeding habitat for black redstart. Whilst there is no certainty that this species would breed within the King's Cross Central site in 2006/7, the history of breeding at the site means that there is that potential. Its dependence on wasteland sites inevitably means that it is likely to disappear from sites as they are developed and appear at other sites as they fall into disuse. The bird is thus dependent on a continuing supply of derelict land for its survival. Whilst it was able to survive in London in the past, current policies for re-use of brownfield sites means that there is pressure to bring such land back into economic use, and thus the available habitat for the birds is under pressure. The bird is national rare and specially protected. Less than 100 pairs breed in the UK each year. The proposals would halt the cycle of re-use and abandonment of land over a considerable area. However the adverse effects would be to a degree off-set by the commitment to provision of green/brown roofs over a minimum of 15% of the area of new buildings within the Main Site. Taking all these factors into account, the overall effects on the black redstart are judged to be negative and of moderate significance.

Other than the predicted negative effects of minor significance of the proposals predicted for Red-list and Amber list birds and terrestrial invertebrates, all other effects on key nature conservation features are assessed as negligible.

Effects without the Triangle Site

It is possible that the proposals for the Main Site could be taken forward alone. As explained above, the Triangle Site includes part of the Railside Land in Islington Site of Borough Importance Grade 1. However, the area has been subject to considerable disturbance as a result of the CTRL works, and it is unlikely that much of the interest of the area would remain at 2006/7.
Depending on the CTRL completion proposals, there is the potential that some of the interest of the area could recover post 2006/7, and in so far as this is the case, the effects of the King’s Cross Central proposals without the Triangle Site would be reduced.

There would be some changes in the effects on railside habitats, and thus for the characteristic species of such habitats, particular ruderal plant species and some terrestrial invertebrates. However this would not affect the overall assessment that there would be a positive effect of minor significance on the Railside Land site, and a negative effect of minor significance on terrestrial invertebrates.

Thus, in the event that the Triangle Site was not developed, there would be no change which would materially alter the assessment of the significance of the ecological and nature conservation effects of the King’s Cross Central proposals.

**Effects with LUL Phase 2 and King’s Cross Station Enhancement**

*Effects at the Construction Stage with LUL Phase 2 and King’s Cross Station Enhancement*

The ongoing LUL Phase 2 works (Northern Ticket Hall and associated infrastructure) are due to be complete by 2007 but are the subject of a current review that may affect the timing of their completion. It is possible, therefore, that the works to complete the project (scheduled to last 3 years) could still be underway in 2007, alongside the development of King’s Cross Central.

If the King’s Cross Station Enhancement proposals go-ahead, there is a range of possible timescales, including the following:

a) construction could commence following completion of the LUL Phase 2 (Northern Ticket Hall etc) works with construction of the Station Enhancement expected to last a maximum of 4 years; or

b) the proposals for King’s Cross Station Enhancement could be combined with the LUL Phase 2 (Northern Ticket Hall) into an integrated project, with construction of that integrated project likely to take less than the 7 years identified above for the two projects to take place one after the other.

It is considered unlikely that an integrated project ((b) above) would have greater overall construction effects (in terms of either magnitude or duration) than the two projects carried out in sequence, one after the other: if anything an integrated project is likely to have less construction effects in terms of magnitude and duration. This assessment has therefore considered (a) above (construction of King’s Cross Station Enhancement following completion of the LUL works) and the potential for it to give rise to cumulative construction effects alongside King’s Cross Central. In order to assess the potential ‘worst case’, this assessment has considered what the effects would be if the peak construction activity from King’s Cross Central coincided with the peak construction activity from LUL/King’s Cross Station Enhancement.

The section of the King’s Cross Central site in the vicinity of the site of the Northern Ticket Hall, and that proposed for the King’s Cross Station Enhancement, is of negligible nature conservation interest, and in this respect there would be no cumulative construction impact on nature conservation interests should the projects go forward together.
14.7.154 It is possible that the Northern Ticket Hall and/or King’s Cross Station Enhancement may require working areas which would also be required for King’s Cross Central, and there may be a need to locate these elsewhere. It is assumed that any such alternative construction sites would also be within the footprint of the King’s Cross Central permanent works, and that there would be no additional nature conservation impacts as a result of any such relocation.

*Effects at the Operational Stage with King’s Cross Station Enhancement*

14.7.155 The section of the King’s Cross Central site in the vicinity of the site of the King’s Cross Station Enhancement, is of negligible nature conservation interest, and in this respect there would be no cumulative impact on nature conservation interests at the operational stage should the proposals go forward concurrently.

14.8 **Opportunities for Further Mitigation Measures**

14.8.1 The mitigation measures which have been incorporated into the King’s Cross Central proposals have been taken into account in assessing the likely nature conservation impacts. The degree of a number of impacts could be further reduced if additional mitigation measures were adopted. Such measures are identified here. They are to a large extent matters for consideration as part of detailed design and implementation process in due course. A number of these measures are referred to in the London Boroughs of Camden and Islington Planning and Development Brief for the King’s Cross Opportunity Area. Whilst there are currently no firm commitments to these measures, and thus they are not relied upon in the assessment of effects above, as the proposals are refined it is likely that at least some of them could be incorporated at later stages.

**Camley Street Natural Park**

14.8.2 The Applicants are discussing with the London Borough of Camden and the London Wildlife Trust, the provision of the new visitor centre at the park to improve facilities for visitors, and particularly for educational use by school parties. Such enhanced provision is referred to at para 3.5.7 of the Planning and Development Brief. The provision of biodiversity information and interpretation points is also referred to. Given that the importance of the park lies primarily in its educational and interpretational function, rather than its intrinsic nature conservation importance, this would be a significant benefit. The Applicants have already assisted with a bid for external funding and pledged a contribution towards future design fees.

**Regent’s Canal/Canalsides**

14.8.3 The Planning and Development Brief indicates potential enhancements to the Canal’s habitat value and biodiversity role (para 3.5.14). These are:

- Reducing the presence of invasive species along the Canalside;
- Retaining or replacing areas of natural vegetation on the Canalside;
- Creating pocket habitats along the Canal edge, for example near bridges;
- Providing safe and secure nesting opportunities e.g. for Sandmartins and Kingfishers;
- Softening parts of the Canal wall, for example by creating vegetation benches and roosting sites;
- New aquatic and other planting to link the Canal, Camley Street Natural Park and adjacent areas; and
- The inclusion of bat friendly design features.

14.8.4 The King’s Cross Canal Action Plan produced by British Waterways on behalf of the Kings Cross Partnership in August 2000 includes recommendations for habitat improvements in the section of the canal within and adjacent to the King’s Cross Central site. These include:

- Improvements to the garden at the Lock Keeper’s cottage at St Pancras Lock.
- Establishment of marginal and aquatic plants in the disused lock of the pair at St Pancras Locks.
- Provision of a linear pocket park next to St Pancras Lock as part of a comprehensive lockside enhancement scheme.
- Installation of a floating boom and planting of aquatic species on the wide corner of the canal at the south of Camley Street Natural Park.
- Habitat improvements and management of the unmanaged bank next to Goods Way Moorings.
- Installation of a floating boom and planting of aquatic species between Goods Way Moorings and Maiden Lane Bridge.

14.8.5 Implementation of these measures (some of which are off-site) would result in improvements to the nature conservation value of the canal. Their implementation would depend upon co-operation with and action by British Waterways.

14.8.6 The degree of construction disturbance to the canal could be reduced by programming the works such that those which are likely to have the greatest disturbance effect were programmed to take place as close together as practicable within the programme. These would be:

- CW10 Canal Square
- CW12 Gas Governor Site: Site Preparation
- CW14 Canal South Bank Works
- CW15 East Bridge: New road and pedestrian bridge incorporating major services
- CW40 Relocate Gas Governor
- CW13: West Bridge
- CW19 Canal North Bank
- CW39 Camley Street Bridge

14.8.7 However, given the major increase in the public use of the site as it is occupied and visited, the actual ecological benefits of such programming are likely to be limited. There would however be benefits in terms of public appreciation of the canal if these works could be completed relatively quickly.
North London Link/Railside land/Wasteland/Built Environment

14.8.8 It would clearly be inappropriate to create “wasteland” within a high quality urban development in central London. However, many of the elements which make such habitats valuable to their particular wildlife can be incorporated in high quality landscapes and in design of buildings. There is commitment to provision of green/brown roofs (or equivalent systems) on a minimum of 15% of the area of new buildings within the Main Site and to the creation of a ‘habitat area’ in the Triangle Site. Any increase in the area of such provision above this minimum would be beneficial. Other potential measures which could be implemented include vertical green/brown habitat walls and other habitat features on buildings, and aggregate based habitat around infrastructure facilities (e.g. gas governor, substation, etc) which could provide habitat for wildlife characteristic of “wasteland” sites.

14.8.9 No indication of the timing of new habitat provision or its distribution across the site is given. In so far as timing is concerned, then the earlier in the programme the better. However, this should not be at the expense of long term effectiveness if this could be better served by later provision which was better related spatially. Timing of green/brown roofs would clearly be driven by the construction programme for buildings. Spatially it would be better to create a number of relatively large blocks of such habitat making up the major part of the 15% minimum of the total area of new buildings within the Main Site. These should preferably be on roofs which are relatively low. It would also be preferable for these roofs to be close to areas of suitable habitat off-site, such as railside land. An example of a suitable location would be the multi-storey car park at the southern end of Development Zone T which would front the railside habitats of the CTRL and other rail lines. It could also be possible to provide habitat on the façade of the car park forming a series of habitat ledges. Much would depend upon the further evolution of each part of the development into detailed design and the extent to which green/brown roofs can be married with occupier requirements, and other design objectives for individual buildings. Another example would be the roof of the proposed health and fitness and community development in Block C of the Triangle Site. This would have a relatively extensive low roof and would be close to the railside land associated with the GNER lines running north from King’s Cross. However, the opportunity for green/brown roofs may be limited by other design objectives, for example the reduction in energy demand through provision of photovoltaics.

14.8.10 Consideration could be given to the management of the site boundary with the CTRL in the north of the site. If the King’s Cross Central and CTRL land were sympathetically managed then an area of some ecological value could be created. This is recognised in the Planning and Development Brief at para 3.5.7, as is the incorporation of ‘green’ trails linking habitats and green spaces. However, management of the CTRL embankment is outside the Applicants’ control.

14.8.11 Consideration could also be given to the potential for the use of parts of the site not programmed for immediate development to provide temporary habitat areas. Particularly in the early stages of the development, works would be undertaken widely across the site to achieve appropriate site levels and to provide essential infrastructure and other elements of the development. It is likely that opportunities for such habitat provision would be limited. Further consideration could be given during detailed design of the initial works.
Species

Breeding birds

14.8.12 In addition to provision of green/brown roofs on buildings, vertical green/brown habitat walls and other habitat features on buildings, and aggregate based habitat around infrastructure facilities (e.g. gas governor, substation, etc.) would provide suitable feeding habitats for black redstarts. Black redstart nest sites could be provided on suitable structures. The benefit of providing shelters, roosts etc is recognised in the Planning and Development Brief at para 3.5.7.

Bats

14.8.13 Bat roosts could be provided in new bridge structures over the canal and in structures associated with the gas governor.

Terrestrial invertebrates

14.8.14 In addition to provision of green/brown roofs on buildings, vertical green/brown habitat walls and other habitat features on buildings, and aggregate based habitat around infrastructure facilities (e.g. gas governor, substation, etc.) would be beneficial. If provided these should include specific habitat features such as rubble mounds and beds of pollen and nectar rich plant species.

14.9 Monitoring

14.9.1 Other than ensuring that black redstarts were not breeding in areas to be cleared for construction prior to commencement of site clearance, and on the assumption that the quality of any discharges to the canal is monitored, there are no requirements for ecological monitoring during the construction works.

14.9.2 Where measures are implemented to mitigate adverse ecological effects of development, it is important that their effectiveness is monitored. This is particularly the case for development which is phased over time since the detailed design and management can be adapted in the light of the results of monitoring. The results of monitoring are also valuable in the wider development of techniques for future application.

14.9.3 In the case of King’s Cross Central the mitigation proposed is specifically targeted at the creation of elements of wasteland habitat in the form of green/brown roofs. In addition to general monitoring of the establishment and development of the habitat, monitoring of characteristic species would be recommended. These should include as a minimum, black redstart and invertebrates typical of wasteland habitats.

14.9.4 The water resources specialist report refers to the possibility of discharging surface water to the Regent’s Canal rather than to sewer. The report states that this would provide a more environmentally sustainable solution for the site as it would relieve the combined sewer system from periodic influxes of water and return the water to the environment. This does not currently form part of the proposals and the ecological effects of any such discharge would need to be considered as part of the further design of the proposals if it were to be proposed and consented. It may be that there would be ecological benefits in increasing the flow in the canal.
### 14.10 References

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Note: This is based on the most up to date base available. There have been changes to the site and its immediate surroundings due to CTRL works.

**KEY**

- Green: Site of Metropolitan Importance
- Orange: Site of Borough Importance Grade 1
- Blue: Site of Borough Importance Grade 2
- Yellow: Site of Local Importance
- Purple: Local Nature Reserve
- Light Blue: Study area: 1km from site

Ecology

Designated Sites

Figure 14.1
14A Phase I Habitat Survey
KINGS CROSS

Phase 1 Habitat Survey

June 2001

Tammy Edwards BSc (Hons)

17 August 2001

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Ecoscope Applied Ecologists is the Corporate name of Ecoscope Applied Ecologists Ltd and Ecoscope Conservation
Notice to Interested Parties

To achieve the study objectives stated in this report, we were required to base our conclusions on the best information available during the period of the investigation and within the limits prescribed by our client in the agreement.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. Thus, we cannot guarantee that the investigations completely defined the degree or extent of e.g. species abundances or habitat management efficacy described in the report.
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EXECUTIVE SUMMARY

0.1 Ecoscape Applied Ecologists were commissioned by RPS Consultants Ltd to carry out a Phase I habitat survey at Kings Cross, London during June 2001.

0.2 The vegetation present within the survey area is generally of a ruderal nature, the species present being common on industrial and brownfield land and the dry shallow soils of urban environments. Much of the site has already been cleared in the early stages of construction/development for the Channel Tunnel Rail Link, and the vegetation is, therefore, largely restricted to cracks in walls and pavements and isolated corners of otherwise built areas. There is more extensive vegetation along the Regent’s Canal and within Camley Street Natural Park. No rare or protected species were recorded.

0.3 With the exception of Camley Street Natural Park, the vegetation of the site is deemed to be of low nature conservation interest. Most, if not all, of the vegetation on the site, including Camley Street Park, has been established within the last 20 or so years.

0.4 Japanese Knotweed is present on parts of the site and this will require control in order to prevent the species spreading as a result of excavation/construction operations. Any waste material such as that arising from cutting, mowing or excavation, must be disposed of in accordance with the Environmental Protection Act 1990 (Duty of Care) Regulations.

INTRODUCTION

1 INTRODUCTION

1.1 Background

1.1.1 Ecoscape Applied Ecologists were commissioned by RPS Consultants Ltd to carry out a Phase I habitat survey at Kings Cross, London during June 2001.

1.2 Site Description

1.2.1 The site boundary comprises Euston Road to the south, St. Pancras Station and the main north-south line leading from it to the west; King’s Cross Station and York Way to the east; and the east-west North London Line running between Camden and Barnsbury to the north. In addition there is a small area in the northeast corner of the site, immediately east of York Way.

1.2.2 The survey area includes: a built-up area extending from between St. Pancras and King’s Cross stations north to Battlebridge Road; two disused gas-holder sites, Camley Street Natural Park; storage facilities and a car-park between Battle Bridge Road and the Regent’s Canal; and a former Goods Yard, storage facilities, golf driving range, concrete works, aggregate and rail facilities north of the canal.
METHODS

2.1 The vegetation of the site was surveyed in accordance with the standard Phase 1 methodology (NCC, 1990). This comprised walking over all accessible areas of the site and recording the habitat types present. In addition, dominant species within each habitat type were recorded, particular areas of interest were targeted noted and a combined species list for the site was compiled.

2.2 Access to almost all parts of the site was possible, with the exception of some sections of the rail tracks and embankments to the north of the Goods Depot. However, these areas could be viewed from the outside and the lack of access is not thought to provide a major constraint on the validity of the survey.

RESULTS

3.1 The survey results are presented in the form of a fair map (Appendix 1) with the various habitat types marked. The map is accompanied by text detailing the dominant species within each habitat type, with descriptions of target noted areas. In addition, a combined species list for the site is given in Appendix 2.

3.2 Plant nomenclature is in accordance with Stace (1997).

3.3 The site comprises primarily industrial land in various stages of development and demolition, with a small area of residential buildings to the south of the site.

3.4 Running east-west through the centre of the site is the Regent's Canal, along the north bank of which runs a footpath. Between the canal and the footpath is a narrow strip of short mown grassland comprising Perennial Ryegrass Lolium perenne, Greater Plantain Plantago major and Clover Trifolium spp.

3.5 Adjacent to the canal, Gipsywort Lycopus europaeus and a few plants of Skullcap Scutellaria galericulata are growing in the canal wall.

3.6 A verge of varying width runs along the northern side of the footpath, containing various common grasses including Wall Barley Hordeum murinum, Perennial Ryegrass, Yorkshire Fog Holcus lanatus, Red Fescue Festuca rubra, together with common species of roadsides and wastelands, including Bramble Rubus fruticosus agg., Hedge Mustard Sinapis officinalis, Cow Parsley Anthriscus sylvestris, Nettle Urtica dioica, Lesser Burdock Arctium minus, Borage Borago officinalis, Green Alkanet Pimpinella sempervirens, Hedge Bindweed Calystegia sepium and Hedge Woundwort Stachys sylvatica.

3.7 Where the canal enters the site at the western boundary, the northern edge of the footpath is vegetated by more scrubby vegetation dominated by Hawthorn Crataegus monogyna, Elder Sambucus nigra and Sycamore Acer pseudoplatanus underlain by Ivy Hedera helix and dense Bramble.

3.8 Several Sycamore seedlings and mature Limetrees Tilia x vulgaris occur along the footpath edge.
3.9. **Target Note 1:** A ten-metre strip of Japanese Knotweed *Fallopia japonica*. This is growing at the base of the canal-side wall of a building and appears to have been flailed cut to a height of approximately one metre. The plant does not show evidence of having been herbicide treated.

3.10. The southern bank of the canal is inaccessible on foot. Vegetation visible from the north bank is dominated by Crack Willow *Salix fragilis*, in particular where the Camley Street Natural Park borders the canal, with occasional Ash *Fraxinus excelsior* and Sycamore. Towards the western site boundary, extensive Buddleja *Buddleja davidii* is visible growing out of the wall bordering Goods Way.

3.11. **Target Note 2:** Camley Street Natural Park, adjacent to the south bank of the canal, is the most botanically rich area within the development site boundary. The park is managed by the London Wildlife Trust and is used for environmental education purposes. A complete species list for the park, compiled in 1995 and made available by park staff, is contained in Appendix 3.

3.12. The park was created in 1983 and the majority of vegetation present has been planted. Common Spotted Orchid *Dactylorhiza fuchsii* first appeared at the site approximately 2 years ago (London Wildlife Trust, pers. comm.). There is a small clump of Japanese Knotweed within the park.

3.13. The park comprises a variety of habitats including meadow, pond, marsh, woodland, scrub and raised flower beds. The vegetation is species-rich with most of the species present being native, with only a few non-native garden species.

3.14. Within the park, amongst trees along the Camley Street boundary, is a small clump of Japanese Knotweed, approximately 2 m tall. Only two stems were visible above ground.

3.15. **Target Note 3:** A second, smaller "natural park" area is adjacent to the canal, accessible from Goods Way. This appears to have been open to public access in the past, with remains of boardwalks present. The park contains two ponds, although one of these is very small, lined entirely by bricks and contains no aquatic or emergent vegetation other than Duckweed *Lemna* sp. The ponds are surrounded by scrub to the edges and along pathways, and an area of ruderal vegetation immediately inside the entrance.

3.16. The main pond is extensively encroached by Common Reed *Phragmites australis* with aquatic species including Fringed Water Lily *Nymphaea peltata*, Water Mint *Mentha aquatica*, Water Forget-me-not *Myosotis scorpioides*. Surrounding the pond, the vegetation comprises common wetland species including Creeping Bent grass *Agrostis stolonifera*, Iris *iris pseudacorus*, Pendulous Sedge *Carex pendula*, Soft Rush *Juncus effusus* and Gipsywort. All the aquatic species, and most of the emergent species, would appear to have been planted; for many, black planting boxes are still visible.

3.17. Pathways around the main pond lead through scrub, comprising Alder *Alnus glutinosa*, Hazel *Corylus avellana*, Pedunculate Oak *Quercus robur*, Aspen *Populus tremula*, Hawthorn *Crataegus monogyna*, Rowan *Sorbus aucuparia*, Field Maple *Acer campestre*, Dogwood *Cornus alba*, Willow, Buddleja and Birch *Betula*.
**Kings Cross: Vegetation Survey June 2001**

*pendula.* The ground cover under this scrub comprises Rough Meadow-grass *Poa trivialis*, Tufted Hair-grass *Deschampsia cespitosa*, Bramble, Ground Ivy *Glechoma hederacea*, Dogrose *Rosa canina*, Ivy, and Cleavers *Cissus quadrata*.

3.18. Immediately inside the gate is a sparsely vegetated area of ruderal vegetation dominated by Ribwort Plantain *Plantago lanceolata*, Mugwort *Artemisia vulgaris*, and Common Toadflax *Linaria vulgaris*. Other species include the grasses Wall Barley, Barren Brome *Alopecurus arvensis*, Timothy Grass *Phleum pratense*, Creeping Bent, and Perennial Rye-grass, together with herb species including Yarrow *Achillea millefolium*, Black Medick *Medicago lupulina*, Cleavers, Petty Spurge *Euphorbia peplus*, Herb Robert *Geranium robertianum*, Broad-leaved Selfheal *Prunella vulgaris*, Oxeye Daisy *Leucanthemum vulgare*, Black Knapweed *Centaurea nigra*, Cut-leaved Crane's-bill *Geranium dissectum* and Nettle. Vegetation along the wall to the roadside boundary comprises a 2 metre wide strip of dense Common Couch grass *Elytrigia repens* with Creeping Thistle *Cirsium arvense* and Buddleja.

3.19. To the west of Canley Street is an Industrial Composting Unit and a Gas Holder site. The latter has been cleared of all vegetation and comprises an area of debris and rubble with gas holders in the process of removal.

3.20. Between Goods Way and Battle Bridge Road, a second Gas Holder site has also been cleared of all vegetation, apart from a few Buddleja bushes around the boundary walls.

3.21. **Target Note 4:** A Depot site has also been cleared of vegetation, apart from two large stands of Japanese Knotweed each measuring approximately 10m x 4m.

3.22. To the south of Battle Bridge Road, the vegetation is predominantly located around a residential area bordered by Cherry Road and Pancras Road. Several courtyard gardens were inaccessible, but Elder *Sambucus nigra* and Ivy *Hedera helix* were visible growing up the sides of buildings, with chain link fencing covered in Virginia Creeper *Parthenocissus quinquefolia*.

3.23. Several Cherry trees *Prunus* spp. have been planted along Stanley Passage and four London Plane trees *Platanus x hispanica* are planted at the Pancras Road end of Battle Bridge Road.

3.24. Buddleja is growing in various locations and can be seen overtopping the walls around a property on the corner of Battle Bridge Road and Pancras Road.

3.25. **Target Note 5:** The 'Platform 12' market place supports small patches of vegetation, including five Lombardy-poplar trees *Populus nigra* var. *italica* underneath which are various grasses and herb species including White Dead-nettle *Lamium album*, Yarrow, Creeping Bent, Yorkshire Fog, Ribwort Plantain, Mugwort, Clover *Trifolium* spp. and Buddleja seedlings. Another area of ruderal vegetation includes these species, together with Scentless Mayweed *Tripleurospermum inodorum*, Barren Brome, Hedge Mustard *Sisymbrium officinale*, Wall Barley and Mallow *Malva sylvestris*.

3.26. **Target Note 6:** The north of the canal is bordered largely by a Goods Depot area which, for the most part, is devoid of vegetation. Cracks in pavements, roadways
and the bases of walls, are exploited by ruderal species including Annual Meadow-grass *Poa annua*, Scentless Mayweed, Great Willowherb *Epilobium hirsutum*, Common Chickweed *Stellaria media*, Hedge Mustard, Tall Rocket *Sisymbrium altissimum*, and Wall Barley. Close to York Way, a small patch of Fern-grass *Cатbogodium rigida* is growing in the pavement.

3.27. **Buddleja** is scattered throughout the westernmost part of the Depot area where it is growing out of the wall of one building well above ground level, and under the Arches where one of the roofs has fallen in. Here, the **Buddleja** is accompanied by Bramble, Bracken *Pteridium aquilinum*, Mugwort and Yorkshire Fog *grass*.

3.28. **Above the Arches**, a disused canal sideing contains sparse vegetation including **Buddleja**, Sycamore seedlings *Acer pseudoplatanus*, Mugwort, Barren Brome, Wall Barley, Dandelion *Taraxacum officinale* agg., and Bittersweet *Solanum dulcamara*. Much of the vegetation was sun-bleached and the shallow substrate was extremely dry.

3.29. **To the north of the Depot**, sections of Railtrack land were inaccessible due to Health and Safety restrictions to safety tracks and embankments. Most of the remaining area to the north of the site comprises active concrete works and similar facilities, which are almost devoid of vegetation apart from access tracks which are predominantly vegetated by Mugwort.

3.30. A dry and dusty access road leading to the concrete works supports several grass species including Fern-grass, Rat’s-tail Fescue *Festuca rubra*, Creeping Bent, Yorkshire Fog, Barren Brome and Perennial Rye-grass. Piles of brick and rubble to the sides of the track support ruderal vegetation including Mugwort, Nettle, **Buddleja**, Scentless Mayweed, Ox-eye Daisy, Toadflax and occasional Ribbed Melilot *Melilotus officinalis* and Common Vetch *Vicia sativa*.

3.31. **Target Note 7**: At the end of this track is a shallow pit containing open ruderal vegetation over dry stony ground. The vegetation is dominated by Rat’s-tail Fescue, together with Black Medick, Ribbed Melilot, Clover, Ox-eye Daisy, Bramble, Yarrow, Toadflax, Perforate St John’s-wort *Hypericum perforatum*, Common Centaury *Centaurium erythraea*, Mugwort and **Buddleja**. The sides of the pit are colonised by Tree Lupin *Lupinus arboreus* and **Buddleja**.

**4 EVALUATION AND CONCLUSIONS**

4.1. The vegetation present within the site is generally of a ruderal nature, the species present being common on industrial and brownfield land and the dry shallow soils of urban environments. Much of the site has already been cleared in the early stages of construction / development of the Channel Tunnel Rail Link, and the vegetation is, therefore, largely restricted to cracks in walls and pavements and isolated corners of otherwise built areas. No protected species were recorded. Fringed Water Lily is nationally scarce; i.e. it occurs in less than 40 ten kilometre squares (Stewart et al., 1997), however it was almost certainly planted and is therefore of negligible conservation interest.
4.2. The most botanically rich area is Camden Street Natural Park, containing a variety of habitats and a diverse collection of species. Of note is the colonisation by Common Spotted Orchid, however, this species is not scarce. Also of note is the presence of Japanese Knotweed within the Park. Whilst the stand is currently small, this species is very fast-growing and invasive. The park managers (London Wildlife Trust) should eradicate this plant from the Park.

4.3. The small disused park off Goods Way contains a diverse range of species, in particular associated with the pond and surrounding shrubs and trees, providing potential habitat for faunal species. However, without continued management it is likely that Common Reed will continue to encroach the main pond, eventually resulting in the pond drying out and allowing terrestrial plant species to colonise. In addition, the grassland under the shrubs and trees could be quickly colonised by scrub species such as Bramble. Whilst this park is of some botanical value in the context of the paucity of vegetation throughout the remainder of the site, it is not considered to represent a sufficiently high conservation interest to present a constraint on development. Although Fringed Water Lily is present, it is likely to have been introduced to the site when the ponds were established. This area may be used as a construction site for the Channel Tunnel Rail Link.

4.4. The only other extensively vegetated area is located at Target Note 6. However, the vegetation comprises mainly common annual and ruderal species with occasional shrubs. Whilst Rat-tail Fescue is uncommon, its distribution being restricted to southern England and Wales, it is not scarce. Although this area supports several species which do not occur elsewhere within the site, it is overall of low botanical interest.

4.5. Japanese Knotweed is present on the site and this will require control. In accordance with the Wildlife and Countryside Act 1981, it is an offence to cause this plant to grow in the wild. Any waste material such as that arising from cutting, mowing or excavation, must be disposed of in accordance with the Environmental Protection Act 1990 (Duty of Care) Regulations.

4.6. The fact that a stand of Japanese Knotweed adjacent to the canal appears to have been fail cut is a cause for concern, especially in view of the fact that the movement of stream and rhizome pieces, either by watercourses or the movement of contaminated soil, is the major cause of spread in the UK. Several herbicides suitable for use adjacent to watercourses are available.

4.7. In view of the overall ruderal nature of the vegetation, the low species-richerity and the absence of any protected or (naturally occurring) scarce species, the vegetation of the site is deemed to be of low nature conservation interest. Camden Street Natural Park is an exception. However, it is understood that the spatial masterplan for Kings Cross Central, as well as the planning brief, will provide for the retention of this Park.

4.8. Given that the survey was carried out close to the optimum time for vegetation surveying, using an extension of the standard Phase I methodology and that all parts of the site were visited, it is not considered that any further surveys of vegetation are necessary.
5 REFERENCES

Environmental Protection Act 1990 (Duty of Care) Regulations. HMSO


APPENDICES

Appendix 1: Phase 1 Habitat Map.
### Appendix 2: Site Species List

<table>
<thead>
<tr>
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Appendix 3: Species List for Camley Street Natural Park.
London Wildlife Trust

Flora of Camley Street Natural Park

listed under Family Name

compiled by Johnnie Slattery

December 1995

This work has been supported by the John Ellerman Fund
**Flora of Camley Street Natural Park**

The listing below has been compiled using Clive Stace's 'New Flora of the British Isles' published by the Press Syndicate of the University of Cambridge 1991. We have used the order and number of families used by Stace. Consequently the number in brackets (23) signifies the family number used by Stace. Old scientific or common names are shown in brackets thus [name]. Garden plants are shown in italics thus: *Garden Plant*.

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FAGACEAE - Beech Family (40)
Quercus robur

BETULACEAE - Birch Family (41)
Alnus glutinosa
A. incana
Betula pendula
Carpinus betulus
Corylus avellana

CISCOPODIACEAE - Goosefoot Family (44)
Atriplex prostrata

CARYOPHYLLACEAE - Pink Family (47)
Agrostemma githago
Cerastium fontanum
Dianthus barbatus
Lychnis coronaria
L. flos-cuculi
Silene dioica
S. dioica x latifolia [S. x hampeana]
S. latifolia [S. alba]
S. vulgaris
Stellaria holostea
S. media
S. uliginosa [S. alsine]

POLYGONACEAE - Knotweed Family (48)
Atriplex prostrata
Fallopia convolvulus [Polygonum convolvulus]
F. japonica [Reynoutria japonica]
Persicaria lapathifolia [Polygonum lapathifolium]
Polygonum aviculare
Rubus acetosa
R. conglomeratus
R. obtusifolius
R. sanguineus

CLUSIACEAE [HYPERICACEAE] - St. John's-wort Family (52)
Hypericum calycinum
H. perforatum

MALVACEAE - Mallow Family (54)
Malva moschata
M. sylvestris
Alcea rosea

VIOLACEAE - Violet Family (56)
Viola riviniana

SALICACEAE - Willow Family (62)
Populus tremula
Salix alba
S. caprea
S. fragilis
S. purpurea
S. viminalis

Pedunculate Oak
Alder
Grey Alder
Silver Birch
Hornbeam
Hazel
Spear-leaved Orache
Corn Cockle
Common Mouse-Ear
Sweet William
Rose Campion
Hagged Robin
Red Campion
Pink Campion
White Campion
Bladder Campion
Greater Stitchwort
Common Chickweed
Bog Stitchwort
Spear-leaved orache
Black-Bindweed
Japanese Knotweed
False Persicaria
Knotgrass
Common Sorrel
Clustered Dock
Broad-Leaved Dock
Wood Dock
Rose of Sharon
Perforate St. John's Wort
Musk Mallow
Common Mallow
Hollyhock
Common Dog Violet
Aspen
White Willow
Goat Willow
Crack Willow
Purple Willow
Osier
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Arabidopsis thaliana
Aubrieta deltoidea
Barbarea vulgaris
Capsella bursa-pastoris
Cardamine hirsuta
C. pratensis
Coronopus didymus
Diplocaulus tenuifolia
Erystimum sp.
E. cheiranthoides
Lunaria annua
Nasturtium-aquaticum [Nasturtium officinale]
Sinapis arvensis
Sisymbrium officinale
S. orientale
Thlaspi arvense

PRIMULACEAE - Primrose Family (70)
Anagallis arvensis
Primula veris
P. vulgaris

GROSSULARIACEAE - Gooseberry Family (73)
Ribes uva-crispa

CRASSULACEAE - Stonecrop Family (74)
Sedum sp.
Sedum sp.
Sempervivum tectorum

ROSACEAE - Rose Family (76)
Agrimonia eupatoria
Cotoneaster stropurpureus
C. salicifolius
Crataegus laevigata [C. oxyacanthoides]
C. monogyna
Eriobotrya japonica
Fragaria vesca
Filipendula ulmaria
F. vulgaris
Geum urbanum
Kerria japonica
Malus sylvestris
Potentilla reptans
Prunus avium
P. padus
P. spinosa
Rosa canina
R. japonica
Rubus caesius
R. fruticosus agg
R. idaeus
Sanguisorba minor ssp. minor
S. minor ssp. purpurea
Sorbus aucuparia
S. intermedia

Garden Stonecrop
Garden Sedum
House Leek

Agrimony
Purple Flowered
Cotoneaster
Willow-leaved Cotoneaster
Midland Hawthorn
Hawthorn
Lotus
Wild Strawberry
Meadowsweet
Droopwort
Wood Avens (Herb Bennet)
Kerria
Crab Apple
Creeping Cinquefoil
Wild Cherry
Bird Cherry
Blackthorn
Dog Rose
Japanese Rose
Dewberry
Bramble
Raspberry
Salad Burnet
Fodder Burnet
Rowan
Swedish Whitebeam
FABACEAE [LEGUMINOSAE] - Pea Family (78)
Scoltia arborescens
Cytisus scoparius [Sarothamnus scoparius]
Gallega officinalis
Laburnum anagyroides
Lotus corniculatus var. sativus
Medicago lupulina
M. sativa spp. sativa
M. sativa spp. varia
Melilotus alba
M. officinalis
Onobrychis vicifolia
Trifolium campestre
T. dubium
T. pratense
T. repens
Ulex europaeus
Viola tricolor
V. hirsuta
V. sativa

LYTHRACEAE - Purple Loosestrife Family (82)
Lythrum salicaria

ONAGRACEAE - Willlowherb Family (85)
Chamerion angustifolium
Epilobium ciliatum
E. hirsutum
E. montanum
E. parviflorum
Oenothera biennis
O. glaucoviana [O. erythrocephala]

CORNACEAE - Dogwood Family (86)
Cornus sanguinea

CELASTRACEAE - Spindle Family (89)
Euonymus europaeus

AQUIFOLIACEAE - Holly Family (90)
Ilex aquifolium
I. x altaclarensis

EUPHORBIAEAE - Spurge Family (92)
Euphorbia lathyris
E. peplus
Mercurialis annua
M. perennis

RHAMNACEAE - Buckthorn Family (93)
Ceanothus sp.

ACERACEAE - Maple Family (100)
Acer campestre
A. platanoides
A. pseudoplatinus

Bladder Senna
Broom
Goat's Rue
Laburnum
Common Bird's-foot Trefoil
Black Medick
Lucerne
Sand Lucerne
White Medick
Rhoad Medick
Sainfoin
Hop Trefoil
Lesser Trefoil
Red Clover
White Clover
Gorse
Tufted Vetch
Hairy Tare
Common Vetch

Purple Loosestrife
Rosebay Willowherb
American Willowherb
Great Willowherb
Broad-leaved Willowherb
Hoary Willowherb
Common Evening Primrose
Large Flowered Evening Primrose
Dogwood*1
Spindle
Holly
Highclere Holly
Caper Spurge
Petty Spurge
Annual Mercury
Dog's Mercury
California Lilac
Field Maple
Norway Maple
Sycamore
GERANIACEAE - Cranes Bill Family (104)
Geranium dissectum
G. endressii
G. lucidum
G. pratense
G. robertianum
G. sanguineum

BALSAMINACEAE - Balsam Family (107)
Impatiens capensis
I. parviflora

ARALIACEAE - Ivy Family (108)
Hedera helix

APIACEAE (UMBELLIFERAE) - Carrot Family (109)
Aegopodium podagraria
Anthriscus sylvestris
Anthriscus sylvestris
Apium nodiflorum
Berula erecta
Carum carvi
Daucus carota
Foeniculum vulgare
Heracleum sphondylium
Levisticum officinale
Myrrha odorata
Oenanthe crocata
Smyrnium olusatrum
Trifolium pratense

SOLANACEAE - Nightshade Family (112)
Solanum dulcamara
S. nigrum
S. tuberosum

CONVOLVULACEAE - Bindweed Family (113)
Calystegia sepium
C. silvatica
Convolvulus arvensis

MENTHACEAE - Bogbean Family (115)
Menyanthes trifoliata
Nympheoides peltata

BORAGINACEAE - Borage Family (118)
Borago officinalis
Myosotis arvensis
M. scorpioides
Pentaglottis sempervirens
Symphytum x uplandicum

LAMIACEAE (LABIATAE) - Deadnettle Family (120)
Ajuga reptans
Bailita nigra
Glechoma hederacea

Cut-leaved Cranes’s-bill
French Cranes’s-bill
Shining Cranes’s-bill
Meadow Cranes’s-bill
Herb Robert
Bloody Cranes’s-bill
Orange Balsam
Small Balsam
Ivy
Ground Elder
Pocky Parsley
Garden Angelica
Wild Angelica
Cow Parsley
Pocky’s Waterschees
Lesser Water Parsnip
Cogsway
Wild Carrot
Fennel
Hogweed
Garden Lovage
Sweet Cicely
Hemlock Water Dropwort
‘Alexanders’
Upright Hedge Parsley
Bittersweet/Woody
Nightshade
Black Nightshade
Potato
Hedge Bindweed
Great Bindweed
Field Bindweed
Dogbean
Fringed Water-lily
Borage
Field Forget-me-not
Water Forget-me-not
Green Alkanet
Russian Comfrey
Bugle
Black Horehound
Ground Ivy
Lamiacrum galeobdolon
Lamium album
L. purpureum
Lavandula angustifolia
L. x intermedia
Lycopus europaeus
Mentha officinalis
M. aquatica
M. spicata
Origanum vulgare
Prunella vulgaris
Rosmarinus officinalis
Salvia officinalis
Salvia montana
Sutellaria galericulata
Stachys byzantina
S. officinalis
S. sylvatica
Teucrium scorodonia
Thymus vulgaris

HIPPURIDACEAE - Marr's-tail Family (121)
Hippuris vulgaris

PLANTAGINACEAE - Plantain Family (123)
Plantago lanceolata
P. major
P. media

Buddlejaceae - Butterfly-bush Family (124)
Buddleja davidii

OLEACEAE - Ash Family (125)
Fraxinus excelsior
Ligustrum vulgare
Syringa vulgaris
Weigela florida

SCROPHULARIACEAE - Figwort Family (126)
Antirrhinum majus
Cymbalaria muralis
Digitalis purpurea
Ligustrum vulgare
Linaria purpurea
L. vulgaris
Scrophularia auriculata [aqua]
S. nodosa
Verbascum nigrum
V. thapsus
Veronica beccabunga
V. hederifolia
V. persica

OROBANCHACEAE - Broomrape Family (127)
Orobanche minor

CAMPANULACEAE - Bellflower Family (131)
Campanula trachelium

Yellow Archangel
White Dead-Nettle
Red Dead-Nettle
French Lavender
Garden Lavender
Gipsywort
Lemon Balm
Water Mint
Spearmint
Marjoram
Self Heal
Rosemary
Garden Sage
Winter Savoury
Skullcap
Lamb's Ear
Betonie
Hedge Woundwort
Wood Sage
Thyme

Marr's-tail

Ribwort Plantain
Greater/Strict-tail Plantain
Hoary plantain

Buddleia

Ash
Wild Privet
Lilac
Weigelia

Snapdragon
Ivy-leaved Toadflax
Foxglove
Wild Privet
Purple Toadflax
Common Toadflax
Water Figwort
Common Figwort
Dark Mullein
Great Mullein
Brooklime
Ivy Leaved Speedwell
Common Field Speedwell

Common Broomrape

Nettle-leaved Bellflower
Rubiaceae - Bedstraw Family (132)
Galium aparine
G. mollugo
G. odoratum
G. verum

Caprifoliaceae - Honeysuckle Family (133)
Lonicera x italic
L. japonica
L. periclymenum
Sambucus nigra
Symphoricarpos albus [S. rivularis]
Viburnum lantana
V. opulus

Valerianaceae - Valerian Family (135)
Centranthus ruber

Dipsacaceae - Teasel Family (136)
Dipsacus fullonum
D. pilosus
Knautiia arvensis
Scabiosa atropurpurea
S. columbaria

Asteraceae [Compositae] - Daisy Family (137)
Achillea millefolium
Anthemis cotula
Arctium minus
Artemisia vulgaris
Aster sp.
Bidens connata
Calendula officinalis
Centaurea nigra
C. scabiosa
Chamaemelum nobile
Chrysanthemum segetum
Cirsium arvense
C. vulgaris
Conyza canadensis
C. sumatrensis
Crepis capillaris
C. vesicaria

Eupatorium cannabinum
Galinago quadriradiata [G. ciliata]
Helianthus annuus
Hypericum radiatum
Lactuca serriola
Lapsana communis
Leontodon autumnalis
Leucanthemum vulgare
Matricaria discoidea [M. matricarioides]
M. recutita
Picris echinoides
P. hieracioides
Philosella aurantiaca [Hieracium aurantiacum]
Scabiosa atropurpurea

Cleavers
Hedge bedstraw
Woodruff
Lady's Bedstraw

Garden Honeysuckle
Japanese Honeysuckle
Wild Honeysuckle
Elder
Snowberry
Wayfaring Tree
Guilder Rose

Red Valerian

Teasel
Small Teasel
Field Scabious
Sweet Scabious
Small Scabious

Yarrow
Stinking Chamomile
Lesser Burdock
Mugwort
Michaelmas Daisy
London Bar-marigold
Garden Marigold
Hardheads/Comman
Knapweed
Greater Knapweed
Chamomile
Corn Marigold
Creeping Thistle
Spear Thistle
Canadian Fleabane
Guernsey Fleabane
Smooth Hawk’s-Beard
Beaked Hawk’s-Beard
Hemp-agrimony
Hairy Galant Soldier
Sunflower
Common Cat’s ear
Prickly Lettuce
Nipplewort
Autumn Hawkbit
Ox-eye Daisy
Pinappleweed
Scented Mayweed
Bristly Ox-Tongue
Hawkweed Ox-Tongue
Fox and Cubs
Sweet Scabious
Senecio squalidus
S. vulgaris
Solidago Canadensis
Sonchus arvensis
S. asper
S. oleraceus
Tanacetum parthenium
Tanacetum vulgare
Taraxacum officinale agg.
Tragopogon porrifolius
T. pratensis
Tripleurospermum inodorum
Tussilago farfara

ALISMATACEAE - Water Plantain Family (139)
Alisma plantago-aquatica

HYROCHARITACEAE - Frog-bit Family (149)
Stratiotes aloides

ARACEAE - Lords-and-Ladies Family (149)
Acorus calamus
Arum maculatum

LEMNACEAE - Duckweed Family (150)
Lemma minor
L. trisulca

JUNCACEAE - Rush Family (153)
Juncus effusus

CYPERACEAE - Sedge Family (154)
Carex divulsa
C. pendula
C. riparia
Cyperus longus
Schoenoplectus lacustris [Scirpus lacustris]

POACEAE [GRAMINEAE] - Grass Family (156)
Agrostis canina
A. capillaris
A. stolonifera
Alopecurus pratensis
Anisantha sterilis [Bromus sterilis]
Anthoxanthum odoratum
Arrhenatherum elatius
Avena fatua
Bromus commutatus
Ceratochloa carinata [Bromus carinatus]
Cynodon cristatus
Dactylis glomerata
Elytrigia repens [Elymus repens]
Festuca pratensis
F. rubra
Glyceria fluitans
G. maxima
Holcus lanatus
Hordeum murinum
K. secalinum

Oxford Ragwort
Groundsel
Canadian Goldenrod
Perennial Sow-Thistle
Prickly/Spiny Sow-Thistle
Smooth Sow-Thistle
Feverfew
Tansy
Dandelion
Salsify
Goatbeard
Scentless Mayweed
Coltsfoot

Common Water Plantain
Water Soldier
Sweet Flag
Lords-and-Ladies
Common Duckweed
Ivy-leaved Duckweed
Soft Rush
Grey Sedge
Pendulous Sedge
Great Pond Sedge
Galingale
Common Club-Rush

Velvet Bent
Common Bent
Creeping Bent/Florin
Meadow Foxtail
Barron Brome
Sweet Vernal Grass
False oat-Grass
Common Wild Oat
Meadow Brome
California Brome
Crested Dog’s Tail
Cocksfoot
Couch Grass
Meadow Fescue
Red Fescue
Floating Sweet-Grass
Reed Sweet-Grass
Yorkshire Fog
Wall Barley
Meadow Barley
Lolium multiflorum
L. perenne
Poa annua
P. pratensis

P. trivialis
Phragmites australis
Trisetum flavescens
Vulpia bromoides

SPARGANIACEAE - Bur-reed Family (156)
Sparganium erectum

TYPHACEAE - Bulrush [Reedmace] Family (157)
Typha angustifolia

T. latifolia

LILIACEAE - Lily Family (160)
Allium schoenoprasum
A. triquetrum
A. ursinum
Calamagrostis nivalis
Hyacinthoides non-scripta
H. hispanica
Loncaojum aestivum
Ornithogalum umbellatum
Polygonatum multiflorum

TRIADICAEAE - Iris Family (161)
Iris foetidissima
I. pseudacorus
I. versicolor
Crocosmia x crocosmiiflora

DIOCCOREACEAE - Black Bryony Family (163)
Tamus communis

ORTHIDACEAE - Orchid Family (164)
Dactylorhiza fuchsii

Italian Rye-Grass
Perennial Rye-Grass
Annual Meadow-Grass
Smooth-Stalked Meadow-Grass
Rough Meadow-Grass
Common Reed
Yellow Oat-Grass
Squirreltail Rescue

Branched Bur-reed

Lesser Bulrush [Lesser Reedmace]
Common Bulrush [Reedmace]

Clives
Three-cornered garlic
Ranunculus
Snowdrop
Wild Bluebell
Spanish Bluebell
Summer Snowflake
Star-of-Bethlehem
Solomon's Seal

Stinking Iris
Yellow Flag
Purple Iris
Montbretia

Black Bryony

Common Spotted Orchid
14B Breeding Bird Survey
KING'S CROSS

Breeding Bird Survey

April – June 2001

Darryl Spittle BSc (Hons), MSc
Duncan Watson BSc (Hons), MSc, AIHEM

30th July 2001

Checked by: [Signature]
Signed: [Signature]
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Ecoscope Applied Ecologists is the Corporate name of Ecoscope Applied Ecologists Ltd and Ecoscope Conservation
Notice to Interested Parties

To achieve the study objectives stated in this report, we were required to base our conclusions on the best information available during the period of the investigation and within the limits prescribed by our client in the agreement.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. Thus, we cannot guarantee that the investigations completely defined the degree or extent of e.g., species abundances or habitat management efficacy described in the report.
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Figure 1.1 Map of King’s Cross showing the boundaries of the survey site.
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INTRODUCTION

1.1 Background

1.1.1 EcoScope Applied Ecologists were commissioned by RPS Consultants Ltd to undertake breeding bird surveys, with a particular focus on Black Redstarts, at King’s Cross, London during the period April to June 2001.

1.2 Site Description

1.2.1 The boundaries of the main survey area are made up of Euston Road to the south; St. Pancras Station and the main north-south line leading from it to the west; King’s Cross Station and York Way to the east; and the east-west North London Line running between Camden and Barnsbury to the north. In addition there is a small area in the northeast corner of the site, immediately east of York Way. The survey area boundaries are shown in Figure 1.1.

1.2.2 The main sites encompassed within the survey area include: a built-up area extending from between St. Pancras and King’s Cross stations north to Battlebridge Road; two disused gas holder sites, Camley Street Natural Park, storage facilities and a car park between Battlebridge Road and the Regent’s Canal; and a former Goods Yard, storage facilities, golf driving range, concrete works, aggregate and rail facilities works north of the canal.

1.3 Objectives

1.3.1 The principal objectives of the survey were to:

- Determine the presence or absence of breeding Black Redstarts and, if present, to ascertain the number and approximate location of breeding territories
- Carry out a general breeding bird survey

1.4 Black Redstarts

1.4.1 Black Redstarts are known to have previously bred within the boundaries of the survey site (London Wildlife Trust, pers. comm.). The population of Black Redstarts in the UK breed largely within urban or industrial environments and the semi-detached nature of parts of the King’s Cross site provides a wealth of potential nest sites close to areas suitable for feeding.

1.4.2 Whilst Black Redstarts are widespread and not uncommon in Europe, with a total European population of between 3.6 and 6.2 million, the species has only bred regularly in the UK since the 1930’s, with the majority of pairs confined to south-east, east and central England (Batten et al. 1990). The maximum number of breeding pairs in the UK has never exceeded 120 and at present the breeding population is below 100 pairs (Ogilvie et al. 2000). The number of UK breeding locations and the maximum and minimum number of breeding pairs for the last ten years of available data is shown in Table 1.1.
Table 1.1 Number of breeding locations and pairs of Black Redstarts within the UK between 1989 and 1998 (Ogilvie et al. 2000).

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of breeding locations</strong></td>
<td>56</td>
<td>50</td>
<td>36</td>
<td>44</td>
<td>53</td>
<td>66</td>
<td>58</td>
<td>46</td>
<td>67</td>
<td>71</td>
</tr>
<tr>
<td><strong>Maximum number of breeding pairs</strong></td>
<td>82</td>
<td>74</td>
<td>69</td>
<td>71</td>
<td>76</td>
<td>95</td>
<td>82</td>
<td>65</td>
<td>99</td>
<td>91</td>
</tr>
<tr>
<td><strong>Minimum number of breeding pairs</strong></td>
<td>36</td>
<td>28</td>
<td>23</td>
<td>14</td>
<td>32</td>
<td>32</td>
<td>19</td>
<td>28</td>
<td>33</td>
<td>32</td>
</tr>
</tbody>
</table>

1.4.3 Black Redstarts are protected under Schedule 1 of the Wildlife and Countryside Act 1981 and are also included on various lists of species of conservation importance including: Red Data Birds in Britain (Batten et al. 1990), the List of Birds of Conservation Importance (JNCC, 1996), the Birds of Conservation Concern Amber List (Gibbons et al., 1996).

2 METHODS

2.1 Timing of visits

2.1.1 The survey consisted of six, approximately fortnightly, visits carried out between mid April and late June 2001 as follows:

Visit 1: April 18th
Visit 2: May 3rd
Visit 3: May 16th
Visit 4: May 31st
Visit 5: June 12th
Visit 6: June 27th

All visits began in the early morning and were completed by early afternoon.

2.2 Black Redstarts

3.2.1 Methods used followed those for breeding Black Redstarts outlined in Gilbert, Gibbons & Evans (1998). On each visit a route was followed that allowed all parts of the site, where possible, to be visited to within approximately 100m. To avoid bias associated with time of day, the direction and starting point of the survey route were varied between visits.

3.2.2 All sightings were plotted on separate maps for each survey visit and all sightings were followed up in an attempt to ascertain whether additional birds were present and to record behaviour, as detailed in Gilbert et al. (1998), allowing the
individual(s) to be assigned to one of three categories: possibly breeding, probably breeding or proved to be breeding.

2.3 General breeding bird survey

2.3.1 The general breeding bird survey was carried out simultaneously to that for Black Redstarts and followed the territory mapping methods outlined by Bibby, Burgess, Hill and Mustoe (2000). All birds seen or heard were mapped, using standard BTO notation, with particular attention paid to recording evidence of breeding, e.g. song, display or territorial disputes, and on recording different individuals of the same species simultaneously, indicating separate breeding territories. For each species, all sightings made during the survey visits were combined onto a single map, to enable analysis of territory clusters.

2.3.2 For territorial species the presence of a species in the same location on a minimum of two visits is taken to constitute a breeding pair. For semi-colonial species, e.g. Linnet, the maximum number of males or pairs recorded on a single visit is taken to represent the number of breeding pairs. For a small number of other species, e.g. Woodpigeon, the number of breeding pairs could not be accurately assessed and the species is simply recorded as present.

2.3.3 Estimates of the number of breeding pairs for many species may represent an underestimate of the true numbers present as these interpretation methods are based on up to ten survey visits (Bibby et al. 2000). However it is considered that the potential number of additional territories that might have been detected by further survey visits is fairly low and likely to relate to the more common species. Therefore additional visits were not considered to be necessary.

2.3.4 The ornithological importance of the site was assessed by evaluating the species recorded against the following criteria:

- Schedule 1 of the Wildlife & Countryside Act 1981
- Red Data Birds in Britain (Batten et al., 1990)
- List of Birds of Conservation Importance (INCC, 1996)
- Birds of Conservation Concern Red and Amber Lists (Gibbons et al., 1996)

3 RESULTS

3.1 Black Redstarts

3.1.1 Black Redstarts were first located on May 16 and on were subsequently recorded on every visit thereafter. In addition the species was also seen between June 18 and 21 during a botanical survey of the site.

3.1.2 The majority of sightings of Black Redstarts occurred within the Excel Logistics depot (see Figure 1.1) and were likely to relate to a single breeding pair. The nest
site was located immediately south of the main depot building. Young were heard in the nest on visit 5 and by visit 6 the nest was found to be empty but intact, indicating that the young had probably fledged. The birds were regularly seen feeding on and around buildings north and northeast of the nest site and on one occasion around disused railway sidings just north of the Pixel Logistics depot.

3.1.3 The only sighting not thought to relate to the aforementioned pair was of a singing male seen on May 31 at the junction of Canley Street and Goodway. This bird was seen to fly in a south-easterly direction before being lost to view. Despite an intensive search on May 31 and subsequent visits this male could not be relocated.

3.1.4 Therefore following the standard criteria the sightings indicate a single confirmed breeding pair and a second possibly breeding male.

3.2 Other species

3.2.1 Table 3.1 lists these species and, where possible, provides an estimate of the number of territories/breeding pairs. Estimates are split between Canley Street Natural Park, which is to be retained alongside any development proposals, and the remainder of the site. A total of 22 species were recorded that were considered to be breeding on the site, of which ten bred in Canley Street Natural Park.

3.2.2 A further 17 species, listed in Appendix 1, were also recorded at the site, either as single records or in unsuitable breeding habitat and were therefore not thought to be breeding on the site. Such records may refer to passage migrants or to species breeding nearby.
**Table 3.1 Numbers of pairs/territories of breeding bird species at King's Cross during April-June 2001.**

<table>
<thead>
<tr>
<th>Species</th>
<th>Estimated number of territories/breeding pairs</th>
<th>Camley Street Natural Park</th>
<th>Remainder of site</th>
<th>Site Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada Goose</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Mallard</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Moorhen</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Coot</td>
<td></td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Lesser Black-backed Guil</td>
<td></td>
<td>5</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Herring Gull</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Stock Dove</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Woodpigeon</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Pied Wagtail</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Wren</td>
<td></td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Dunnock</td>
<td></td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Robin</td>
<td></td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Black Redstart</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blackbird</td>
<td></td>
<td>3</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Blue Tit</td>
<td></td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Great Tit</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Magpie</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrion Crow</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starling</td>
<td></td>
<td>10</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>House Sparrow</td>
<td></td>
<td>4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Greenfinch</td>
<td></td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Linnnet</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

4 EVALUATION

4.1 Black Redstarts

4.1.1 Black Redstarts were found to be breeding within the Exel Logistics, depot with possibly an additional male within the southern area of the site.

4.1.2 Black Redstarts are protected under Schedule 1 of the Wildlife and Countryside Act 1981 and are listed in Red Data Birds in Britain (Batten et al., 1990), the List of Birds of Conservation Importance (JNCC, 1996) and the Birds of Conservation Concern Amber List (Gibbons et al., 1996). In addition to the general protection offered by the Wildlife and Countryside Act, it is also an offence to cause ‘disturbance’ to Schedule 1 species whilst they are nesting or nurturing dependent young. Any person convicted of such offences is liable to a significantly higher maximum penalty than in respect of other birds given basic protection under the act.
4.1.3 Paragraph 47 of PPC9 states that “the presence of a protected species is a material consideration when a local planning authority is considering a development proposal which, if carried out, would be likely to result in harm to the species or its habitat.” It then goes on to say that, “they should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the protection of the species...” Incorporation of suitable Black Redstart habitat, either by retention or creation, into the landscaping of the development would therefore be appropriate at King’s Cross.

4.1.4 Feeding habitat for Black Redstarts principally consists of sparsely vegetated, open habitats, often regarded as “wasteland”. Such habitats could be provided at ground level, away from high profile areas where such “untidy” habitats might be undesirable, or at building-top level as “green roofing”.

4.1.5 Green roofing is one of the most radical ideas recently developed to meet conservation requirements in London. Extensive green roofing is used in many parts of the world as a lightweight and energy-efficient alternative to concrete roofs. It also provides mitigation habitat in densely developed urban areas where ground level habitat creation is constrained by space or disturbance.

4.1.6 Measures to provide habitat above ground level have been successful at other sites in London (e.g. Frith & Gedge, 2000). Although the extent of habitat provision very much depends on the type of building, even small areas of green roofing may provide undisturbed feeding habitat for Black Redstarts.

4.1.7 To create suitable feeding habitat for Black Redstarts roofs could be surfaced with a nutrient-poor sandy, gravel subgrade. Areas that are likely to be visible to the public could be sown with visually attractive stonecrops (Sedum spp.) whilst areas less visible could be allowed to colonise naturally, hence following the mitigation outlined in Frith & Gedge 2000.

4.1.8 Black Redstarts do not require specialised nesting habitat, choosing to breed in many locations from cavities in buildings to piles of concrete. However, in addition to the creation of feeding habitat, Black Redstart nest boxes could be incorporated into the design of buildings, to provide suitable habitat for this species.

4.2 Other species

4.2.1 Beyond the presence of Black Redstarts, King’s Cross is an area of limited value for breeding birds. A total of 39 species were recorded during the breeding season of which 22 showed signs of breeding on site. All of the breeding species occurred in small numbers.

4.2.2 Seven species were found breeding during the survey that meet one, or more, of a range of criteria relating to conservation importance. The species and relevant lists of conservation importance are given in Table 4.1.
Table 4.1 Species recorded breeding at King's Cross during April-June 2001 that meet at least one criteria relating to conservation importance.

<table>
<thead>
<tr>
<th>Species</th>
<th>JNCC Birds of Conservation Importance</th>
<th>NGO Birds of Conservation Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesser Black-backed Gull</td>
<td>[ ]</td>
<td>Amber list</td>
</tr>
<tr>
<td>Herring Gull</td>
<td>[ ]</td>
<td>Amber list</td>
</tr>
<tr>
<td>Stock Dove</td>
<td>[ ]</td>
<td>Amber list</td>
</tr>
<tr>
<td>Dunnock</td>
<td>[ ]</td>
<td>Amber list</td>
</tr>
<tr>
<td>Blackbird</td>
<td>[ ]</td>
<td>Amber list</td>
</tr>
<tr>
<td>Starling</td>
<td>[ ]</td>
<td>Amber list</td>
</tr>
<tr>
<td>Linnet</td>
<td>[ ]</td>
<td>Red list</td>
</tr>
</tbody>
</table>

Notes on Table 4.1

4.2.3 All seven species listed in Table 4.1 are relatively common and widespread and are of conservation importance as a result of large, recent declines in their populations, principally as a result of changes in agricultural practices, rather than loss of habitat due to development. A relatively low number of pairs of each species were recorded during the survey, e.g. ten pairs of Starling, eight pairs of Dunnock, etc. Although precise details of the proposed development were not available it is understood that some areas, such as Camley Street Natural Park, will be retained and it is therefore likely that several of these species will continue to breed at the site following development. The presence of these species is therefore not considered to provide a constraint on development.

4.2.4 Although the species listed above are not thought to provide a constraint on development the nests of all species of wild bird are protected under the Wildlife & Countryside Act against damage or destruction whilst they are in use or being built. Site clearance / demolition works should therefore be timed to take place outside the bird breeding season (March - July) if possible. If site clearance / demolition works during the bird breeding season are unavoidable all areas to be affected should be checked for nesting birds by a suitably qualified ecologist immediately prior to work commencing.

5 REFERENCES


APPENDICES

Appendix 1: Additional species recorded at King's Cross but not considered to breed on the site.

Common Crane
Grey Heron
Greylag Goose (feral)
Tufted Duck
Sparrowhawk
Kestrel
Black-headed Gull
Common Tern
Rock Dove (feral)
Swift
Swallow
Grey Wagtail
Sedge Warbler
Reed Warbler
Whitethroat
Blackcap
Goldfinch
Appendix 2: Vernacular and scientific names of the 39 species recorded at King's Cross.

<table>
<thead>
<tr>
<th>Vernacular name</th>
<th>Scientific name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cormorant</td>
<td>Phalacrocorax carbo</td>
</tr>
<tr>
<td>Grey Heron</td>
<td>Ardea cinerea</td>
</tr>
<tr>
<td>Greylag Goose</td>
<td>Anser anser</td>
</tr>
<tr>
<td>Canada Goose</td>
<td>Branta canadensis</td>
</tr>
<tr>
<td>Mallow</td>
<td>Anas platyrhynchos</td>
</tr>
<tr>
<td>Tufted Duck</td>
<td>Aythya fuligula</td>
</tr>
<tr>
<td>Sparrowhawk</td>
<td>Accipiter nisus</td>
</tr>
<tr>
<td>Kestrel</td>
<td>Falco tinnunculus</td>
</tr>
<tr>
<td>Moorhen</td>
<td>Gallinula chloropus</td>
</tr>
<tr>
<td>Coot</td>
<td>Fulica atra</td>
</tr>
<tr>
<td>Black-headed Gull</td>
<td>Larus ridibundus</td>
</tr>
<tr>
<td>Herring Gull</td>
<td>Larus argentatus</td>
</tr>
<tr>
<td>Lesser Black-backed Gull</td>
<td>Larus fuscus</td>
</tr>
<tr>
<td>Common Tern</td>
<td>Sterna hirundo</td>
</tr>
<tr>
<td>Rock Dove</td>
<td>Columba livia</td>
</tr>
<tr>
<td>Stock Dove</td>
<td>Columba oenas</td>
</tr>
<tr>
<td>Woodpigeon</td>
<td>Columba palumbus</td>
</tr>
<tr>
<td>Swift</td>
<td>Apus apus</td>
</tr>
<tr>
<td>Swallow</td>
<td>Hirundo rustica</td>
</tr>
<tr>
<td>Grey Wagtail</td>
<td>Motacilla cinerea</td>
</tr>
<tr>
<td>Pied Wagtail</td>
<td>Motacilla alba</td>
</tr>
<tr>
<td>Wren</td>
<td>Troglodytes troglodytes</td>
</tr>
<tr>
<td>Dunnock</td>
<td>Prunella modularis</td>
</tr>
<tr>
<td>Robin</td>
<td>Erithacus rubecula</td>
</tr>
<tr>
<td>Black Redstart</td>
<td>Phoenicurus ochruros</td>
</tr>
<tr>
<td>Blackbird</td>
<td>Turdus merula</td>
</tr>
<tr>
<td>Sedge Warbler</td>
<td>Acrocephalus schoenobaenus</td>
</tr>
<tr>
<td>Reed Warbler</td>
<td>Acrocephalus scirpaceus</td>
</tr>
<tr>
<td>Whitethroat</td>
<td>Sylvia communis</td>
</tr>
<tr>
<td>Blackcap</td>
<td>Sylvia atricapilla</td>
</tr>
<tr>
<td>Blue Tit</td>
<td>Parus caeruleus</td>
</tr>
<tr>
<td>Great Tit</td>
<td>Parus major</td>
</tr>
<tr>
<td>Magpie</td>
<td>Pica pica</td>
</tr>
<tr>
<td>Carrion Crow</td>
<td>Corvus corone</td>
</tr>
<tr>
<td>Starling</td>
<td>Sturnus vulgaris</td>
</tr>
<tr>
<td>House Sparrow</td>
<td>Passer domesticus</td>
</tr>
<tr>
<td>Greenfinch</td>
<td>Carduelis chloris</td>
</tr>
<tr>
<td>Goldfinch</td>
<td>Carduelis carduelis</td>
</tr>
<tr>
<td>Linnel</td>
<td>Carduelis cannabina</td>
</tr>
</tbody>
</table>
14C  Black Redstart Survey 2002
BLACK REDSTART SURVEY

King’s Cross, London

April - July 2002

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7th August 2002

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Notice to Interested Parties

To achieve the study objectives stated in this report, we were required to base our conclusions on the best information available during the period of the investigation and within the limits prescribed by our client in the agreement.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. Thus, we cannot guarantee that the investigations completely defined the degree or extent of e.g. species abundances or habitat management efficacy described in the report.
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Figure 1.1. Map of King's Cross showing boundary of the survey site .................. 7
EXECUTIVE SUMMARY

0.1 Bioscope Applied Ecologists were commissioned by RPS Consultants to undertake a survey of Black Redstarts, at King's Cross, London during the period April to July 2002.

0.2 A species-specific monitoring method, as described in Gilbert, Gibbons & Evans (1998), was used to ascertain the presence, abundance and likelihood of breeding of Black Redstarts within the survey area.

0.3 A single singing male Black Redstart was located on April 17th, however, no subsequent sightings of this individual or of any additional birds occurred. Following the standard criteria, this indicates possible breeding.

0.4 Unlike the previous survey in 2001, actual breeding at the site was not confirmed in 2002. It is possible that the major construction works and physical changes to the site as a whole have rendered it less suitable for breeding, at least temporarily. The area where Black Redstarts bred last year has not itself changed, but disturbance around the periphery of this area has increased substantially.

0.5 In order to ensure compliance with the Wildlife & Countryside Act (1981), if development of the area identified as a possible breeding site does not take place before the 2003 breeding season, it is recommended that further specific surveys for nesting Black Redstarts are carried out immediately prior to construction / demolition taking place.

INTRODUCTION

1.1 Background

1.1.1 Bioscope Applied Ecologists were commissioned by RPS Consultants to undertake a survey of Black Redstarts, at King's Cross, London during the period April to July 2002. This survey follows confirmed breeding of black redstart at the site in 2001 (Ecoscope 2001).

1.2 Site Description

1.2.1 The boundaries of the survey area are made up of Euston Road to the south; St. Pancras Station and the main north-south railway line to the west; King's Cross Station and York Way to the east; and the North London railway line running between Camden and Barnsbury to the north. In addition there is a small area in the north-east corner of the site immediately east of York Way (see Figure 1.1).

1.2.2 The main sites encompassed within the survey area include: a built-up area extending from between St. Pancras and King's Cross stations north to Battlebridge Road; two disused gas-holder sites, Carnley Street Natural Park, storage facilities and a car-park between Battlebridge Road and the Regent's Canal; and further
storage facilities, a disused freightliner terminal and a cement works north of the canal.

1.2.3 During the course of the survey, major construction works were taking place within the site in connection with construction of the Channel Tunnel Rail Link (CTRL). The gas holders in the western gas holder site were dismantled and the site excavated extensively. One of the gas holders on the eastern site was dismantled and three of the dismantled holders from the western site were put into storage in this area adjacent to the one remaining standing gas holder. A number of buildings were demolished in the area between Kings Cross and St Pancras Stations. Major works including demolition of existing facilities and construction of new railway lines took place within the area north of the Regents Canal.

1.3 Black Redstarts

1.3.1 Black Redstarts are known to have previously bred within the boundaries of the survey site (Ecoscope 2001). The population of Black Redstarts in the UK breed largely within urban or industrial environments and the industrial/transport uses of the King's Cross site has provided potential nest sites close to areas suitable for feeding.

1.3.2 Black Redstarts are widespread and not uncommon in Europe, with a total European population of between 3.6 and 6.2 million (Hagemeijer & Blair 1997). However, the species has only bred regularly in the UK since the 1930's, with the majority of pairs confined to south-east, east and central England (Batten et al. 1990).

1.3.3 The maximum number of breeding pairs in the UK has never exceeded 120 and at present the breeding population is below 100 pairs (Ogilvie et al. 2001). The number of breeding locations and the maximum and minimum number of breeding pairs for the last ten years of available data is shown in Table 1.1.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Number of breeding locations</td>
<td>56</td>
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<td>36</td>
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<td>58</td>
<td>46</td>
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<tr>
<td>Maximum number of breeding pairs</td>
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<td>74</td>
<td>69</td>
<td>71</td>
<td>76</td>
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<td>Minimum number of breeding pairs</td>
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<td>28</td>
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<td>32</td>
<td>32</td>
<td>19</td>
<td>28</td>
<td>33</td>
<td>32</td>
<td>15</td>
</tr>
</tbody>
</table>

Notes on Table 1.1
1. Records from important areas in London, Birmingham and Kent were not available to Ogilvie et al. (2001), therefore the reported totals produce an artificially low population estimate for 1999.

1.3.4 Black Redstarts are protected under Schedule 1 of the Wildlife and Countryside Act 1981 and are also included on various lists of species of conservation importance including: Red Data Birds in Britain (Batten et al. 1990), the List of Birds of
Conservation Importance (JNCC, 1996) and the Birds of Conservation Concern Amber List (Gibbons et al., 1998).

1.4 Objectives

1.4.1 The principal objective of the survey was:

• to determine the presence or absence of breeding Black Redstarts and, if present, to ascertain the number and approximate location of breeding territories.

2 METHODS

2.1 Timing of visits

2.1.1 The survey consisted of five, approximately fortnightly, visits carried out between mid April and early July 2002 as follows:

Visit 1: April 17th
Visit 2: May 20th
Visit 3: May 30th
Visit 4: June 20th
Visit 5: July 4th

2.1.2 All visits began in the early morning and were completed early afternoon.

2.1.3 Methods used followed those for breeding Black Redstarts outlined in Gilbert et al. (1998). On each visit a route was followed that allowed all parts of the site, where possible, to be visited to within approximately 100m. To avoid bias associated with time of day, the direction and starting point of the survey route was varied between visits.

2.1.4 All sightings are plotted on separate maps for each survey visit and are followed up in an attempt to ascertain whether additional birds are present and to record behaviour allowing the individual(s) to be assigned to one of three categories:

• Possible breeding is indicated by: birds recorded during the breeding season; birds seen in possible nesting habitat during the breeding season; and / or a singing male recorded once during the breeding season.

• Probable breeding is indicated by: a pair of birds seen in suitable breeding habitat during the breeding season; a singing male recorded at the same location more than once; courtship or display are seen; a bird recorded visiting a probable nest-site; birds seen exhibiting agitated behaviour or giving alarm calls; and / or nest-building being observed.
Proven breeding is indicated by: a nest or used nest being found; a nest with young being seen or heard; recently fledged young located; adults are seen entering or leaving a nest-site; an adult seen incubating; and/or an adult seen carrying food for young or a faecal sac.

3 RESULTS

3.1.1 A single singing male Black Redstart was located on April 17th. No subsequent sightings of this individual or of any additional birds were made during the survey period.

3.1.2 The sighting occurred within the Exel Logistics depot, with the bird singing from the roof of the grainary building. Despite intensive searches on subsequent visits, this male could not be relocated.

3.1.3 Following the standard criteria as outlined above, the sighting made during the survey indicates a single possible breeding attempt.

4 DISCUSSION

4.1.1 Black Redstarts were found to be possibly breeding within the Exel Logistics depot.

4.1.2 All nesting birds are protected under Section 1 of the Wildlife and Countryside Act (1981). It is an offence to intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; or take or destroy an egg of any wild bird. Black Redstart is included on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) which means it is also an offence to intentionally disturb them while they are building a nest or when they are in, on or near a nest containing eggs or young, or to disturb their dependent young. Under the Countryside and Rights of Way (CROW) Act (2000) it is now also an offence to cause 'reckless' as well as intentional disturbance to Schedule 1 species.

4.1.3 In order to ensure compliance with the Wildlife & Countryside Act (1981), it is recommended that further specific surveys for nesting Black Redstarts are carried out immediately prior to construction / demolition taking place if development of the area identified as a possible breeding site does not take place before the 2003 breeding season.

4.1.4 The redevelopment of the site will present opportunities for provision of suitable Black Redstart habitat in the landscape of the development. For further details regarding the provision of feeding habitat and suitable nesting locations see Ecoscope (2001) and Frith & Gedge (2000).
CONCLUSIONS

5.1 Black Redstart was recorded during the breeding season in suitable habitat for the second consecutive year. The record indicated possible breeding in 2002.

5.2 Unlike the previous survey in 2001, actual breeding at the site was not confirmed in 2002. It is possible that the major construction works and physical changes to the site as a whole have rendered it less suitable for breeding, at least temporarily. The area where Black Redstarts bred last year has not itself changed, but disturbance around the periphery of this area has increased substantially.

REFERENCES


Figure I.1. Map of King's Cross showing boundary of the survey site

Key
- Survey Area Boundary
14D Amphibian Survey
KING'S CROSS

Amphibian Survey

June 2001

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17th August 2001

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Table 3.2 Number of Smooth Newts recorded during bottle-trapping surveys

Table 3.3 Number of Smooth Newts recorded during dip-netting surveys

Figure 1.1 Map showing boundary of survey site and location of ponds surveyed
EXECUTIVE SUMMARY

0.1 Ecoscope Applied Ecologists were commissioned by RPS Consultants Ltd to undertake a survey of amphibians with particular emphasis on Great Crested Newts Triturus cristatus at King's Cross, London during June 2001.

0.2 Two sites within the survey area were identified as possessing potential habitat for amphibians, although neither site was considered to provide optimal habitat for Great Crested Newts: Camley Street Natural Park and a small adjacent plot located at 2-3 Goodway. Within Camley Street Natural Park two artificial ponds were surveyed and within 2-3 Goodway a further two artificial ponds were surveyed.

0.3 Amphibians were surveyed using three standard techniques (Gent & Gibson, 1998); counting by torchlight, bottle-trapping and netting. Surveys were carried out over three successive dates between 18th – 21st June 2001.

0.4 No Great Crested Newts were recorded during the survey.

0.5 Smooth Newts Triturus vulgaris were recorded from ponds B, C and D whilst both Common Frog Rana temporaria and Common Toad Bufo bufo were recorded in Camley Street Natural Park on every night during the survey. All of these species are partially protected under Section 9(5) of the Wildlife and Countryside Act 1981, which prohibits the sale, transporting and advertising for sale of the species. However, all three of the amphibians recorded during the survey are common and widespread species. The presence of these species does not therefore constitute a legal constraint on the development of the site. However, where the habitat of such species is to be destroyed by development, it is good practice to capture these species and translocate them to suitable habitat elsewhere. We understand that this area may be used as a construction site for the Channel Tunnel Rail Link, and that smooth newts are being translocated to suitable sites elsewhere in advance of any works which may affect this site.

INTRODUCTION

1 Background

1.1 Ecoscope Applied Ecologists were commissioned by RPS Consultants Ltd to undertake a survey of amphibians with particular emphasis on Great Crested Newts Triturus cristatus at King's Cross, London during June 2001.

1 Site Description

1.2 The boundaries of the survey area are made up of Euston Road to the south; St. Pancras Station and the main north-south line leading from it to the west; King’s Cross Station and York Way to the east; and the east-west North London Line running between Camden and Barnsbury to the north. In addition there is a small area in the north-east corner of the site immediately east of York Way. The survey area boundaries are shown in Figure 1.1.
1.2.2 The main sites encompassed within the survey area include: a built-up area extending from between St. Pancras and King's Cross stations north to Battlebridge Road; two disused gas-holder sites, Camley Street Natural Park, storage facilities and a car-park between Battlebridge Road and the Regent's Canal; and a former Goods Yard, storage facilities, golf driving range, concrete works, aggregate and rail freight facilities north of the canal.

1.2.3 Two sites within the survey area were identified as possessing potential habitat for amphibians, although neither site was considered to provide optimal habitat for Great Crested Newts: Camley Street Natural Park and a small adjacent plot located at 2-3 Goods Way. The locations of these areas are shown on Figure 1.1.

1.2.4 Within Camley Street Natural Park two artificial ponds were surveyed. The larger pond (Pond A) is approximately 20 m x 6 m in size. The smaller pond (Pond B) is approximately 2 m x 1 m. Pond A is fringed with trees (mainly Birch Betula spp., Alder Alnus spp. and Willow Salix spp.), Common Reed Phragmites australis, and a variety of emergent flora. Pond B is enclosed within raised walls and is almost covered in duckweed Lemna spp. Water clarity in both ponds was moderate, and water quality appeared to be reasonable, although there was a small amount of litter in Pond A. There is a regular exchange of water between Pond A and the Grand Union Canal; this has resulted in the accidental introduction of fish and Red-eared Terrapins Trachemys scripta into the pond (London Wildlife Trust, pers. comm.).

1.2.5 Within 2-3 Goods Way a further two artificial ponds were surveyed. The larger pond (Pond C) is approximately 10 m x 5 m in size. The smaller pond (Pond D) is approximately 2 m x 1 m. Pond C is largely fringed with trees (mainly Alder Alnus spp. and Willow Salix spp.) and Common Reed Phragmites australis. Pond D is enclosed within raised walls. Water clarity in Pond C was good, and water quality appeared to be reasonable; water clarity in Pond D was poor.

1.3 Great Crested Newts

1.3.1 Great Crested Newts are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 and Regulation 39 of the Conservation (Natural Habitats etc.) Regulations 1994.

1.3.2 Taken together, the legislation protecting Great Crested Newts prohibits the following:

- deliberately or intentionally killing and capturing (taking) or intentionally injuring;
- deliberately disturbing;
- deliberately taking or disturbing eggs;
- damaging or destroying a breeding site or resting place or intentionally damaging a place used for shelter and protection;
- intentionally obstructing access to a place used for shelter, and
- keeping, transporting, selling or exchanging; offering for sale or advertising.

1.3.3 Following the passing of the Countryside and Rights of Way (Countryside) Act 2000, protection of species under Section 9 of the Wildlife & Countryside Act, which
refers to animals listed on Schedule 5, has been increased to include reckless as well as intentional killing, injuring, damage, etc.

1.3.4 Consequently, in addition to the animals themselves, Great Crested Newt habitat is also protected, and activities that damage their habitat or impede their use of certain parts of it are prohibited.

1.4 Objectives

1.4.1 The principal objective of the survey was to determine the presence or absence of Great Crested Newts and, if present, to provide an estimate of the number of individuals present. Other amphibians were also to be recorded.

2 METHODS

2.1 Amphibians were surveyed using three standard techniques (Gent & Gibson, 1998): counting by torchlight, bottle-trapping and netting. Surveys were carried out over three successive dates between 18th – 21st June 2001. It should be noted that these dates are slightly outside the period of March to May during which, following the standard JNCC method (Griffiths et al., 1996), surveys for Great Crested Newts should ideally take place. However, it is considered that Great Crested Newts would have been recorded by this survey, albeit possibly in reduced numbers, if they were present at the site.

2.2 Torchlight counts

2.2.1 Torchlight counts were carried out each night between 21:30 and 23:00. Counts consisted of slowly walking the accessible perimeter of each pond whilst scanning for newts with a powerful torch. All newts were recorded and, where possible, identified as male or female.

2.3 Bottle-trapping

2.3.1 Due to the nature of the ponds bottle traps could only be used along restricted parts of the banks of ponds A and C. Traps were placed at an average distance of 1 m apart in suitable areas around the edge of Pond A and an average distance of 0.5 m apart in suitable areas around the edge of Pond C. The traps were set by 20:30 each night and checked before 10:00 the following day.

2.4 Dip-netting

2.4.1 Dip-netting was carried out in ponds B and D in which the incidence of duckweed, poor water clarity and the lack of sloping edges reduced the effectiveness of torchlight counts and made bottle-trapping impossible.
3 RESULTS

3.1 Torch counts

3.1.1 No Great Crested Newts were located during torchlight counts; however, there were 113 Smooth Newt *T. vulgaris* sightings during the three counting sessions. Table 3.1 shows the number of Smooth Newts recorded on each occasion.

Table 3.1: Number of Smooth Newts recorded during torchlight counts

<table>
<thead>
<tr>
<th>Date</th>
<th>Pond A</th>
<th></th>
<th>Pond B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Unsexed</td>
<td>Total</td>
</tr>
<tr>
<td>18/6/01</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>19/6/01</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20/6/01</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

3.2 Bottle-trapping

3.2.1 No Great Crested Newts were captured during the three trapping sessions; however, there were 82 Smooth Newt captures. Table 3.2 shows the number of Smooth Newts caught in bottle traps on each trapping occasion.

Table 3.2: Number of Smooth Newts recorded during bottle-trapping surveys

<table>
<thead>
<tr>
<th>Date</th>
<th>Pond A</th>
<th></th>
<th>Pond C</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Unsexed</td>
<td>Total</td>
</tr>
<tr>
<td>19/6/01</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20/6/01</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21/6/01</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

3.3 Dip-netting

3.3.1 No Great Crested Newts were captured during dip-netting sessions; however, in total there were 15 Smooth Newt captures. Table 3.3 shows the number of Smooth Newts caught on each occasion.
### Table 3.3: Number of Smooth Newts dip-netted.

<table>
<thead>
<tr>
<th>Date</th>
<th>Pond B</th>
<th>Pond D</th>
<th>Pond C</th>
<th>Pond D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Unsexed</td>
<td>Total</td>
</tr>
<tr>
<td>19/6/0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20/6/0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21/6/0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### 3.4 Additional records

3.4.1 A single Smooth Newt was found amongst logs adjacent to pond A on 20th June. In addition, five Smooth Newts were located under artificial refugia associated with the reptile survey (see separate report) within 2-3 Goodsway on 21st June. The London Wildlife Trust (pers. comm.) also reported capturing Smooth Newt larvae in pond A during educational dip-netting sessions. Both Common Frog *Rana temporaria* and Common Toad *Bufo bufo* were recorded in Camley Street Natural Park on every night during the survey, although neither species was recorded in the ponds at 2-3 Goodsway.

### 4 EVALUATION AND CONCLUSIONS

4.1 No Great Crested Newts were located during the survey.

4.2 Smooth Newts were recorded from ponds B, C and D. No Smooth Newts were found in Pond A; however, this pond could not be surveyed extensively and the existence of a small number of Smooth Newts is considered likely, particularly given the London Wildlife Trust records. The presence of fish and Red-eared Terrapins in Pond A is probably a major factor in the relative paucity of newts in this pond.

4.3 It is understood that Camley Street Natural Park (and therefore ponds A and D) will be retained alongside any development proposals, however it is not known whether the ponds at 2-3 Goodsway will be lost. These may in any event be affected by construction works in connection with the Channel Tunnel Rail Link. All British amphibian species are partially protected under Section 9(5) of the Wildlife and Countryside Act 1981, which prohibited the sale, transporting and advertising for sale of the species. However, all three of the amphibians recorded during the survey (Smooth Newt, Common Frog and Common Toad) are common and widespread species. The presence of these species does not therefore provide a legal constraint on the development of the site. However, where the habitat of such species is to be destroyed by development, it is good practice to capture these species and translocate them to suitable habitat elsewhere. We understand that such translocation is already in progress in advance of any Channel Tunnel Rail Link works.
5 REFERENCES


Figure 1.1: Map showing boundary of survey site and location of ponds surveyed.
14E Reptile Survey
King's Cross

Reptile Survey

June – August 2001

Darryl Spittle BSc (Hons), MSc

29th August 2001

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Table 2.1 Weather conditions at King's Cross during reptile survey visits.

Table 3.1 Smooth Newts recorded at Goodsway, King's Cross June-August 2001.

Figure 1.1 Map of King's Cross showing the boundaries of the survey area and the location of the reptile refugia.
EXECUTIVE SUMMARY

0.1 Ecoscope Applied Ecologists were commissioned by RPS Consultants to carry out a survey of reptiles at King’s Cross, London, during the period June to August 2001.

0.2 Two sites within the survey area were identified as possessing potential, though suboptimal, habitat for reptiles: a small area within the railway lands in the north of the survey area; and a small plot located at 2-3 Goods Way.

0.3 Reptiles were surveyed using standard methods (Gent & Gibson, 1998); the placement and regular examination of artificial refugia. A total of 30 refugia were placed in the two locations described above on 20 June. All refugia were examined on five occasions between mid June and mid August 2001.

0.4 No reptiles were recorded during the survey.

0.5 A small number of Smooth Newts were recorded using the refugia at 2-3 Goods Way. The presence of this species at this site was also identified during the amphibian survey (Ecoscope, 2001).

INTRODUCTION

1.1 Ecoscope Applied Ecologists were commissioned by RPS Consultants to carry out a survey of reptiles at King’s Cross, London, during the period June to August 2001.

1.2 The boundaries of the survey area are made up of Euston Road to the south; St. Pancras Station and the Midland Main Line to the west; King’s Cross Station and York Way to the east; and the east-west North London Line running between Camden and Barnsbury to the north. In addition there is a small area in the northeast corner of the survey area immediately east of York Way (see Figure 1.1).

1.3 The survey area includes a built-up area extending from between St. Pancras and King’s Cross stations north to and beyond Battlebridge Road; two disused gas-holder sites, Camley Street Natural Park, storage facilities and a car-park between Battlebridge Road and the Regent’s Canal; and a Goods Yard, storage facilities, golf driving range, concrete works, aggregate and rail facilities north of the canal.

1.4 The principal objective of the survey was to determine the presence or absence of reptile species and, if present, to estimate the size of the population.

METHODS

2.1 The standard method for surveying reptiles entails the placement and regular examination of artificial refugia. For this survey corrugated steel sheets, approximately 600mm x 750mm in size, were used as refugia.
2.2 Locations for refugia were chosen on the basis of habitat potential. Two sites within the survey area were identified as possessing potential, though sub-optimal, habitat for reptiles; a small area within the railway lands in the north of the survey area; and a small plot located at 2-3 Goods Way. Camley Street Natural Park was also considered to provide potential, though sub-optimal, habitat for reptiles, however permission to use refugia in the Natural Park was not given due to fears that the use of refugia might lead to damage to the meadow area at the site, although there are not known to be any records of reptiles at the site (London Wildlife Trust, pers. comm.).

2.3 A total of 30 refugia were placed in the two locations described above on 20 June. The locations surveyed are shown in Figure 1.1.

2.4 All refugia were examined on five occasions between mid June and mid August 2001 as follows:

Visit 1: 21 June
Visit 2: 27 June
Visit 3: 20 July
Visit 4: 7 August (2-3 Goods Way)
Visit 5: 23 August

14 August (railway lands in the north of the survey area)

2.5 Reptile activity is greatly influenced by weather conditions; refugia are most likely to be used when the temperature is between 10°C and 17°C, in hazy or intermittent sunshine with light winds (Gent & Gibson, 1998). Therefore, as far as possible, visits were timed to coincide with suitable weather conditions. The weather conditions during each inspection of the reptile refugia are shown in Table 2.1.

Table 2.1 Weather conditions at King's Cross during reptile survey visits.

<table>
<thead>
<tr>
<th>Date</th>
<th>Weather conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 June</td>
<td>Hot, sunny, dry, wind variable 0-1</td>
</tr>
<tr>
<td>27 June</td>
<td>Warm, sunny, dry, wind variable 3-6</td>
</tr>
<tr>
<td>20 July</td>
<td>Warm, sunny, dry, wind SW 2-3</td>
</tr>
<tr>
<td>7 August</td>
<td>Warm, sunny, dry, wind SW 2</td>
</tr>
<tr>
<td>14 August</td>
<td>Hot, sunny, dry, wind SW 1-2</td>
</tr>
<tr>
<td>23 August</td>
<td>Hot, o/c, dry, wind SW 1-2</td>
</tr>
</tbody>
</table>
3 RESULTS

3.1 No reptiles were recorded during the survey, however a small number of Smooth Newts Triturus vulgaris were recorded beneath the refugia at 2-3 Goods Way. Records of Smooth Newts are shown in Table 3.1.

Table 3.1 Smooth Newts recorded at Goodway, King's Cross June-August 2001.

<table>
<thead>
<tr>
<th>Refugia number</th>
<th>Date and time of visit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 June 11:00</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
</tr>
</tbody>
</table>

4 DISCUSSION AND CONCLUSIONS

4.1 No reptiles were recorded during the survey.

4.2 A small number of Smooth Newts were recorded using the refugia at 2-3 Goods Way. The presence of this species at this site was also identified during the amphibian survey (Ecoscope, 2001).

5 REFERENCES


Figure 1.1 Map of King’s Cross showing the boundaries of the survey area and the location of the reptile refugia.
14F Bat Survey
Rat surveys of Kings Cross

August 2001

Clare FitzGibbon BA MSc PhD
Matthew Fasham BSc MSc AIFRM

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Figure 1.1 Location of bat contacts recorded during surveys ........................................ 7
EXECUTIVE SUMMARY

0.1 Ecoscope Applied Ecologists were commissioned by RPS Consultants to carry out a preliminary bat survey of land at Kings Cross, together with an assessment of the probability of the site supporting bat roosts.

0.2 Surveys were carried out on four days in August 2001 (7th, 8th, 14th and 16th). Dusk and night-time bat detector surveys were undertaken in order to establish which species were present and which parts of the survey area appear to be most favourable for bats.

0.3 Only one bat species (Common Pipistrelle Pipistrellus pipistrellus) was definitely recorded during the survey with bat detectors. Records of this species were made from the Camley Street Natural Park and adjacent to the Goods Depot. A total of four bat records were made during four nights of bat surveys. Although bat detector surveys cannot provide a reliable index of population size, the small number of records indicates that it is highly unlikely that the site is used by large numbers of bats.

0.4 Although it was not feasible in the time available to survey the interior of the large number of buildings and other man-made structures that could have potentially housed roosting bats, the survey area is considered unlikely to support a substantial colony (based on the low level of bat activity on site within 1 hour of dusk, when most bats emerge from roost sites).

0.5 It is considered that the King's Cross survey area is of low value to roosting and foraging bats, and that bats do not therefore present a constraint to development.

INTRODUCTION

1.1 Ecoscope Applied Ecologists were commissioned by RPS Consultants to carry out a survey of bats at King's Cross, London, during August 2001.

1.2 The boundaries of the survey area are made up of Euston Road to the north; St. Pancras Station and the Midland Main Line to the west; King's Cross Station and York Way to the east; and the east-west North London Line running between Camden and Barnsbury to the north. In addition there is a small area in the north-east corner of the survey area immediately east of York Way (see Figure 1.1).

1.3 The survey area includes a built-up area extending from between St. Pancras and King's Cross stations north to and beyond Battlebridge Road; two disused gas-holder sites, Camley Street Natural Park, storage facilities and a car-park between Battlebridge Road and the Regent's Canal; and a Goods Yard, storage facilities, golf driving range, concrete works, aggregate and rail facilities north of the canal.

1.4 The principal objective of the survey was to determine the degree of use of the site by bats and hence to assess the value of the site for bats.
LEGISLATION

2.1 All British bat species are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981, as updated by the Countryside and Rights of Way Act 2000. All bat species are also included on Schedule 2 of the Conservation (Natural Habitats etc.) Regulations 1994. Taken together, these pieces of legislation make it an offence to:
- intentionally or recklessly kill, injure or capture bats;
- deliberately or recklessly disturb bats (whether in a roost or not); and
- damage, destroy or obstruct access to bat roosts.

2.2 A roost is defined as 'any structure or place which [a bat] uses for shelter or protection'. As bats tend to reuse the same roosts, a roost is protected whether or not bats are present at the time of survey.

METHODS

3.1 Bat detector surveys

3.1.1 Surveys were carried out on four days in August 2001 (7th, 8th, 14th and 16th). Day and night-time bat detector surveys were undertaken.

3.1.2 The bat surveys consisted of walking around the survey area, listening for bats with a bat detector. A Batbox 3 heterodyne bat detector was used. Bat contacts were identified to species level where possible, and visual cues were also used if the bat was seen. The bat detector frequency was varied between 22 KHz and 120 KHz to ensure that bats of all species were detected if present. On two nights, the bat survey concentrated on the section of the Regent's Canal which passes through the survey area, together with the Camden Street Natural Park and a small area of semi-natural vegetation along Goods Way (see Figure 1.1). These areas were considered to be the most favourable habitat for bats in the survey area, as a result of the presence of semi-natural vegetation and the relative abundance of flying insects over the waterway. On the other two nights, the bat survey concentrated on the built-up parts of the survey area, particularly the Goods Depot and adjacent buildings. Weather conditions were suitable for bats to be foraging on all surveys visits (i.e. not very heavy rain or strong winds), and on two of the visits, the weather was considered to be ideal – warm, with little or no wind.

3.1.3 There are a number of limitations to bat detector surveys which makes the interpretation of transect data difficult. These include:
- The echolocation calls of species such as Brown Long-eared Bat Plecotus auritus are very quiet, and these species therefore tend to be under-recorded.
- Some bats are impossible to identify to species level using heterodyne detectors (e.g. it is not possible to differentiate between Whiskered and Brandt’s Bat Agyina mystacinus and M. brandtii).
- Unless more than one call is detected simultaneously, or more than one bat is seen at the same time, it is not possible to tell whether two separate contacts are two different bats. Bat detector surveys therefore provide only an index of bat activity, not population size.
3.2 Bat roost surveys

3.2.1 It is possible to locate bat roosts by checking likely roost sites for signs of bats (e.g., droppings and stains), and by waiting outside potential roosts at dusk to see whether bats emerge. Since all bat roosts are protected (see Section 2), potential roost sites need to be checked prior to any buildings being demolished or refurbished.

3.2.2 The large number of buildings in the survey area at Kings Cross means that it was not feasible to survey every building in detail given the time available. Instead an overall assessment was made of the probability of bats roosting in the area, based on the type and condition of the buildings present and the general abundance of bats in the vicinity.

4 RESULTS

4.1 Bat detector surveys

4.1.1 The location of features of interest / areas surveyed are marked on Figure 1.1. Single Common Pipistrelle *Pipistrellus pipistrellus* bats were recorded at Camley Street Natural Park on the nights of 7th and 8th August (each comprising a single brief pass in both cases), at the Depot site on the night of the 14th August (again a single brief pass), and along the canal on the night of the 16th August.

4.1.2 It is difficult to make accurate counts of bats using an area unless they are recorded whilst emerging from a roost. However, the low number of bat detectors indicated that the number of bats using the survey area for foraging was very low, particularly considering the extent of the area surveyed.

4.2 Bat roost surveys

4.2.1 Bats will use a wide variety of man made structures as roost sites, including the roofs of buildings, cracks in walls, cellars etc. The bats may not be easily visible, often being concealed in crevices, behind roofing felt, in cavity walls and under ridge tiles. Entrance holes to potential roost sites may be as small as 2 cm diameter, in the case of the smaller bat species. Consequently, locating roost sites can be extremely difficult. The species most commonly occurring in buildings is the Pipistrelle, but other bats frequently recorded in buildings include Brown Long-eared and Serotine bats. These bats primarily use buildings for breeding during the summer, and in general disperse during the autumn.

4.2.2 A large number of buildings and structures on the Kings Cross survey area may potentially support bat roosts. In addition, there are trees in the Camley Street Natural Park which may potentially support bat roosts. However, given the low frequency of bat records on the site at dusk (most bats emerge from roosts within an hour of dusk), it seems unlikely that any of the buildings are currently supporting substantial roosts. While bats may roost at considerable distance from their foraging...
sites, they frequently fly down linear features such as hedgerows and lines of trees en route to foraging grounds. In the case of the Kings Cross survey area, the canal provides one obvious linear feature that they may fly along, particularly as it passes near the grounds of the St Pancras Hospital, an area of potential foraging habitat just off the site. The lack of bat records at dusk along the canal on the two evening visits that concentrated on this area supports the conclusion that there are no substantial bat roosts on or near the survey area.

5 DISCUSSION AND CONCLUSIONS

5.1 Although bat detector surveys cannot provide a reliable index of population size, the low number of bat records made during the site survey indicates that the survey area is not being used by large numbers of bats. The only bat species recorded within the survey area, the Common Pipistrelle, is the most commonly recorded species in towns. It is a UK Biodiversity Action Plan Priority Species, but is widely distributed (Richardson, 2000), and common in many areas.

5.2 All UK bats are insectivorous and prefer to forage in areas where insect numbers are high. Generally these are areas of vegetation, particularly trees and hedges, and over water, although some species will feed on insects attracted to street lamps. Kings Cross does not provide large areas of suitable foraging habitat, the most suitable areas being the Camley Street Nature Park, along the Grand Union Canal and the small area of natural habitat on Goods Lane. It is understood that both the Camley Street Natural Park and the Regent’s Canal will be retained alongside any development proposals. While the Goods Way site is small, it comprises a significant proportion of the semi-natural habitat on the survey area (since the total area of such habitat is so low). However, no bats were recorded from the Goods Way area during either of the two nights this area was surveyed and it is therefore not considered to be significant in terms of bat foraging habitat.

5.3 Although it was not feasible in the time available to survey the large number of buildings and man made structures that could have potentially housed roosting bats, the survey area is considered unlikely to support a substantial colony (based on the low level of bat activity on site within 1 hour of dusk, when most bats emerge from roost sites).

5.4 In conclusion, therefore, the survey area is considered to be of very limited value for bats. The canal and vegetated areas at Camley Street Nature Park are the only areas considered of any value for foraging bats. It is understood that the spatial masterplan for Kings Cross Central, as well as the planning brief, will provide for the retention of these areas.

6 REFERENCES


Figure 1.1 Location of bat contacts recorded during surveys
14G Invertebrate Appraisal
KING'S CROSS

Invertebrate Appraisal

2001

Colin W. Plant BSc (Hons), F.R.E.S.

8th October 2001

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Notice to Interested Parties

To achieve the study objectives stated in this report, we were required to base our conclusions on the best information available during the period of the investigation and within the limits prescribed by our client in the agreement.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. Thus, we cannot guarantee that the investigations completely defined the degree or extent of e.g. species abundances or habitat management efficacy described in the report.
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EXECUTIVE SUMMARY

0.1 Invertebrates and their habitats were studied in the Kings Cross – St. Pancras area of London.

0.2 Within the study area, areas of invertebrate interest were the Camley Street Natural Park, an area of ruderal vegetation between the railway lines and at isolated places on the banks of the Regent’s Canal. Remaining areas are of no invertebrate interest whatsoever.

0.3 The probable loss of the ruderal area is unfortunate, but it is small. Its complement of Nationally Notable species is not unexpected at such sites in London and its loss would not be of high nature conservation significance in the London context.

0.4 The canal bank vegetation is poor in invertebrate species, although since the bulk of the surrounding area is quite devoid of invertebrates in any case it forms an area of interest than could be enhanced in mitigation for any unforeseen losses elsewhere.

0.5 Camley Street Natural Park is an oasis in the desert of roads and buildings. Although many of the species may have been introduced to the site with plants, most are clearly surviving here. However, the absence of an established assemblage, which includes a complement of scarcer species, suggests that invertebrates are not colonising the Camley Street site from adjacent areas to any significant degree.

0.6 Camley Street Natural Park is to be retained and is already isolated in the urban area. With this in mind, there are no grounds, based upon invertebrate ecology, to raise objection to the proposed development of the surrounding areas.

0.7 Nevertheless there would be benefits if the design of the redeveloped area could include provision to encourage the development of areas of ruderal vegetation in suitable locations, for example, between railway lines and along the canal banks.

INTRODUCTION AND METHODOLOGY

1.1 Ecoscope were commissioned by RPS Consultants Ltd to investigate the invertebrate habitats and fauna in the area between and to the north of Kings Cross and St. Pancras Stations in London and to appraise the results in relation to ongoing developments on the site. The survey area is shown on Figure 1.

1.2 The survey was to include Orthoptera, Syrphidae, Odonata and Carabidae, plus Lepidoptera and any other appropriate groups as dictated by on-site conditions.

1.3 A preliminary visit was made on 3rd July 2001. Because of time-consuming difficulties arising from the complex site ownership, security and health & safety issues, much of this visit was occupied in site familiarisation. In particular, time was spent in viewing it from adjacent tall buildings, in an effort to establish which areas within it, if any, were most likely to provide adequate data for an appraisal of overall invertebrate interest to be conducted satisfactorily.
1.4 Further visits were made on 27th July, 24th August, 11th September and 21st September, though because of various security requirements and access difficulties not all areas of the development zone were visited on each date.

1.5 In general, direct observation will reveal adult Odonata (dragonflies and damselflies) and a combination of this plus listening for the distinctive courtship stridulations of each species will reveal the Orthoptera (grasshoppers and crickets).

1.6 Syrphidae (Hoverflies), and many other invertebrates, are easily recorded using Malaise traps. However, these are vulnerable to vandalism and it was judged unwise to use them at King's Cross.

1.7 Apart from Malaise trapping, a number of techniques are available for the detection or capture of invertebrate species. For Carabidae (ground beetles) as well as many other beetles groups and for spiders, pitfall trapping is recommended. However, plans made on the first site visit to set such traps in the aggregate yard were thwarted when, on the second visit, the area where trapping may have proved useful had been cleared as part of the CTRL preparatory works and was no longer of potential interest.

1.8 Discussion with various personnel across the site indicated that the few areas where pitfall trapping was judged potentially valuable were all likely to be cleared as part of the CTRL works before any samples could be collected.

1.9 Furthermore, because of a misguided sense of animal rights, many urban-dwelling people are offended by traps that kill insects. Pitfall trapping was, therefore, confined to a very few discrete places within Carley Street Natural Park and the traps were hidden away from where they could be found by people or picked up in a litter clearance operation. Even so, about half the traps were absent on the subsequent visit.

1.10 Lepidoptera are the butterflies and moths. Work on the moths was seriously constrained by the local environment in that the optimum recording method calls for the use of mercury vapour lamps overnight. Over almost all of the area the use of lights would have been totally ineffective, since the area is already more or less constantly illuminated by artificial light sources.

1.11 Light trapping at Carley Street was considered, but not carried out. This was partly for the same reason, but also for reasons of equipment security and personal safety - the park is known to be in use overnight by prostitutes and their clients and by a host of undesirables, including substance abusers and homeless alcoholics.

1.12 A summary of the various trapping techniques is included as Appendix 4, although as stated above it should be noted that of these Malaise trapping and light trapping were not used at King's Cross.
2 INVERTEBRATE HABITATS

2.1 Three important considerations were immediately apparent during the first visit on 3rd July 2001:

- The vast bulk of the site comprises buildings and hard standing of very low potential interest as invertebrate habitat,

- Small areas of potential interest were unlikely to remain undisturbed by site clearance associated with the CTRL construction works for the duration of the survey, and so passive trapping (e.g., pitfall trapping) was unlikely to be useful;

- The only exception was likely to be Camley Street Natural Park.

2.2 An aggregate yard was actively being moved during the survey. A limited amount of active sampling was planned for here, but on the next visit the potential invertebrate habitats (sparsely-vegetated mounds of soil and other materials), had been removed.

2.3 Additionally, a small area of ruderal vegetation between railway lines in the north-east of the development area, adjacent to and to the east of York Way, appeared to have potential for invertebrates.

2.4 Sampling was, therefore carried out at three locations – Camley Street Natural Park, along the canal banks and between the rail lines in the north-eastern corner of the site. These locations are shown on Figure 1.

2.5 The results are presented in Appendices 1, 2 and 3.

3 INVERTEBRATE SPECIES

3.1 Nationally Rare species are those falling within the Status categories defined in the British Red Data Books. These are internationally recognised species listed in the various Red Data Books published by, or under the auspices of, the International Union for the Conservation of Nature (IUCN). Species included may not be informally removed or transferred between categories. There are four categories as follows:

RDB 1 “Endangered”. Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. These include:

- Species known from only a single locality since 1990;
- Species restricted to habitats which are especially vulnerable;
- Species which have shown a rapid and continuous decline in the last twenty years and are now estimated to exist in five or fewer localities;
- Species believed extinct but which would need protection if re discovered.
RDB 2  “Vulnerable”. Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating. These include:

- Species declining throughout their range;
- Species in vulnerable habitats;
- Species whose populations are low.

RDB 3  “Rare”. Taxa with small populations which are not at present endangered or vulnerable but which are at risk. These include:

- Species which are estimated to occur in fifteen or fewer localities.

RDB K  Taxa suspected to fall within the RDB categories but which are at present insufficiently known to enable placement.

3.2 Nationally Scarce species are those falling within the Nationally Notable categories. They are species which are estimated to occur within the range of 16 to 100 ten-kilometre squares of the British National Grid system since 1970. The specific categorisations of species have been revised since their inception for a number of taxa.

3.3 Notable species are subdivided as follows:

- Na  species estimated to occur within the range of 16 to 50 ten-kilometre squares of the National Grid System.
- Nb  species estimated to occur within the range 51 to 100 ten-kilometre squares of the National Grid System.

- N  Diptera (flies) not separated, falling into either category Na or Nb.

3.4 Nationally Local species are those which, whilst fairly common, are evidently less widespread than truly common species, but also not qualifying as Nationally Notable having been recorded from over one hundred, but less than three hundred, ten-kilometre squares of the UK National Grid.

3.5 The National Status Codes, where these are Local or higher, are indicated against species names in the appendices

3.6 The overall site supports a relatively high number of species, distributed as follows:

<table>
<thead>
<tr>
<th>Rail line area</th>
<th>RDB</th>
<th>Na</th>
<th>Nb</th>
<th>N</th>
<th>L</th>
<th>C</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canal banks</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>14</td>
<td>61</td>
<td>82</td>
</tr>
</tbody>
</table>
3.7 The two nationally notable category A species are the solitary bee *Hylaeus cornutus* and the solitary wasp *Crossecerus distinguendus*. They are probably not nesting at this small part of the overall site, which is probably a feeding area – Camley Street Natural Park is considered the only potential breeding site in the local area and both species were also recorded there.

3.8 The three nationally notable category B species are all beetles found in the area to the east of York Way and are associated with the ruderal vegetation there. They are *Lonicera pauculata*, *Pogonosaurus fuscicornis* and *Hippodamia variegata*. It is assumed that this vegetation would be lost as a result of development of this area. This loss should, ideally, be mitigated for as part of the development by providing areas where similar early successional vegetation can be allowed to develop and be maintained.

3.9 The canal banks support an uninteresting invertebrate fauna.

3.10 Perhaps unsurprisingly, Camley Street Natural Park records the longest list of invertebrates, with a total of 160 species. Interestingly, the percentage of these which is in any way noteworthy is considerably lower; both the Nationally Notable (Na) species (*Hylaeus cornutus* and *Crossecerus distinguendus*) were also recorded in the other survey compartments; the Notable hoversfly (*Pristella virilis*) is quite common in London and is to be expected here.

3.11 This low number of uncommon species at Camley Street may reflect the largely artificial and imported nature of the floral community. This, together with the site’s indisputable isolation, forms an invertebrate species reservoir that has not yet acquired an assemblage of species which might be expected to contain less common species.

4 **DISCUSSION**

4.1 There is some invertebrate interest apparent in the ruderal vegetation between the railway lines in the north-east corner of the site.

4.2 Sparsely-vegetated sites on nutrient-poor substrates form an important component of the urban ecological picture in London. Such sites develop a unique flora and are, at least for a few years, important sites for a wide range of invertebrates, especially those which are to some degree thermophilic.

4.3 Such sites are scattered within the developed urban area and, whilst perhaps appearing to the casual eye to be physically isolated, together they form a mosaic of sites that supports meta-populations of solitary bees, solitary wasps, beetles and other invertebrates that are able to move around by flying.
4.4 In this framework, no one site is particularly more important than another - and a poor quality site may be a good quality site in the future. The nature of the sites is such that they will come and go, with bare sites becoming sparsely-vegetated and passing through a succession of stages until overaken by Buddleja, elder or other scrub. At this final stage, the invertebrate fauna is quite different to that exhibited by sparsely-vegetated sites. As one site is lost in this manner, another is created by clearance and so the cycle continues.

4.5 In this context, the loss of this habitat at the Kings Cross site would, on its own, be of no greater consequence than the loss of other local sites. However, the situation is affected not only by the rate at which sites are lost to the habitat mosaic, but also by the rate at which new ones are added. In the last twenty to thirty years, more or less coinciding with the closure of the London docks and the re-development of the former dockland area, the equation has become unbalanced, so that the loss of sites far outstrips their creation and overall there is a net decline.

4.6 On this basis, the loss of even a small site such as this is unfortunate and if possible it should be mitigated by allowing similar vegetation to develop between rail lines, on canal banks, or in other areas, as part of the project. If such areas are to remain of value then they will require management to maintain the early successional nature of the vegetation.

4.7 Camley Street Natural Park forms an island in the otherwise largely ecologically sterile King's Cross area of London; it is to be retained and, in view of the fact that the existing surrounding area is of very limited ecological value, it seems to matter little if it continues to be isolated after the development has finished. However, if the park could be connected to other areas of vegetation by provision of 'green corridors' through the development area, this would enable greater movement of invertebrate species into and out of the site. If this could be achieved this would be beneficial in terms of the invertebrate ecology of the natural park.

4.8 The banks of the canal are rather poor for invertebrates and may, therefore, provide a site for mitigating any losses through development as a green corridor. The canal in particular might usefully be encouraged to act as a 'green corridor' permitting gene flow between Camley Street Natural Park and outlying areas.

5 CONCLUSIONS

5.1 Terrestrial invertebrates are not considered to present any significant constraints on the proposed development at Kings Cross.

5.2 The retention of Camley Street Natural Park within the new development is unlikely to adversely affect its invertebrate ecology.

5.3 Mitigation for loss of invertebrate habitat losses could include the development of the Regent's Canal as a 'green corridor', provision of other 'green corridors' within the developed area, and promoting the formation of ruderal plant communities in suitable areas.
Figure 1. Plan showing survey area boundaries and sampling locations
APPENDIX 1: INVERTEBRATES RECORDED IN THE NORTHEAST OF THE SITE, ADJACENT TO YORK WAY

<table>
<thead>
<tr>
<th>Group/species</th>
<th>National status</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COLEOPTERA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cantharidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Rhagonycha fulva</em></td>
<td>local</td>
<td>common soldier beetle</td>
</tr>
<tr>
<td>Carabidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Erotylus malidas</em></td>
<td>Local</td>
<td>ground beetle</td>
</tr>
<tr>
<td>Chrysomelidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Altica lyhri</em></td>
<td>Local</td>
<td>polyphagus</td>
</tr>
<tr>
<td><em>Chrysomela hyperici</em></td>
<td>Local</td>
<td>associated with Hypericum</td>
</tr>
<tr>
<td>Cryptochiles maruell</td>
<td>Local</td>
<td>associated with Hypericum</td>
</tr>
<tr>
<td>Longiarius luridus</td>
<td>Nb</td>
<td>actually very common in the south-east</td>
</tr>
<tr>
<td>Oedema melanopa</td>
<td>Nb</td>
<td></td>
</tr>
<tr>
<td>Podagrica fuscinorix</td>
<td>Nb</td>
<td>associated with mallows (Malva spp.)</td>
</tr>
<tr>
<td>Coccinellidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adalia 3-punctata</td>
<td>Nb</td>
<td></td>
</tr>
<tr>
<td>Coccinella 7-punctata</td>
<td>Nb</td>
<td></td>
</tr>
<tr>
<td>Hippodamia variegata</td>
<td>Nb</td>
<td>dry, sandy places</td>
</tr>
<tr>
<td>Propylea 14-punctata</td>
<td>Nb</td>
<td></td>
</tr>
<tr>
<td>Psyliobra 22-punctata</td>
<td>Nb</td>
<td></td>
</tr>
<tr>
<td>Derestidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthrenus verbasci</td>
<td>Nb</td>
<td></td>
</tr>
<tr>
<td>Melyridae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malachius bipustulatus</td>
<td>Nb</td>
<td></td>
</tr>
<tr>
<td>Nitidulidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meligethes aeneus</td>
<td>Nb</td>
<td></td>
</tr>
<tr>
<td>Oedemeridae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oedemera lurida</td>
<td>Local</td>
<td>common beetle on ruderal sites in London</td>
</tr>
<tr>
<td>Oedemera nohtis</td>
<td>Nb</td>
<td></td>
</tr>
<tr>
<td>Staphylinidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tachyporus hymnorum</td>
<td>Nb</td>
<td></td>
</tr>
<tr>
<td>Group / species</td>
<td>National status</td>
<td>Comments</td>
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</tr>
<tr>
<td>DERMAPTERA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forficulidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forficula auricularis</td>
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<td>common earwig</td>
</tr>
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<td>DIPTERA</td>
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</tr>
<tr>
<td>Conopidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physoscephala rupestris</td>
<td>Local</td>
<td>parasitic on bees</td>
</tr>
<tr>
<td>Stratiomyidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pachygena leachi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syrphidae</td>
<td></td>
<td>hoverflies</td>
</tr>
<tr>
<td>Episephus betulae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eristalis arbustorum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eristalis pertinax</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leucoptera coralli</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melanostoma mellinum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platycheirus albimanus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sphaerophoria rupestris</td>
<td>Local</td>
<td>coastal species (including River Thames)</td>
</tr>
<tr>
<td>Sphaerophoria scripta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syrta pipina</td>
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<td></td>
</tr>
<tr>
<td>Sturna pyrocephala</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tachinidae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eriopus rufomaculata</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tephritidae</td>
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</tr>
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<td>Paroxia misella</td>
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<td>Terebellia ruficans</td>
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</tr>
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<td>Therevidae</td>
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<td>Thereva nobilitata</td>
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<tr>
<td>HETEROPTERA</td>
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</tr>
<tr>
<td>Anthocoridae</td>
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<td>Anthocoris nemoralis</td>
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<td>Heterogaster uraliae</td>
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</tr>
<tr>
<td>Miridae</td>
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</tr>
<tr>
<td>Callocharis norvegicus</td>
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<td>Liocheta truncatula</td>
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</tr>
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## APPENDIX 2: INVERTEBRATES RECORDED ON THE CANAL BANKS

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# APPENDIX 3: INVERTEBRATES RECORDED AT CAMLEY STREET NATURAL PARK

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**DERMAPTERA**

Forficulidae

Forficula auricularia Common Earwig

**HEMIPTERA: Auchenorrhyncha**

Cercopidae

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APPENDIX 4: INVERTEBRATE SAMPLING TECHNIQUES

PITFALL-TRAPPING

Vending-machine cups or similar are placed in the ground with the rim flush with, or slightly below, the surface. A fluid is added, containing ethylene glycol, sodium chloride and formalin with a little detergent to reduce surface tension. Traps may be covered or uncovered and are typically left in position for a month at a time. Holes made in the sides of the cups a couple of centimetres below the rim permit flood or rain water to drain without the traps over-flowing and the catch becoming lost. Invertebrates simply fall into the traps. Traps are typically set in pairs or in groups of three (at the points of an equilateral triangle, usually with a side of 1 metre) and may be positioned along a fixed transect to permit repetition.

Effective in all habitats at most times of the year for ground beetles (Carabidae), rove beetles (Staphylinidae), some other beetle groups, spiders and most non-insect soil-dwelling arthropods, but best time depends on target taxa.

SWEEP-NETTING

A stout hand-held net is moved vigorously through vegetation to dislodge resting insects. The technique may be used semi-quantitatively by timing the number of sweeps through vegetation of a similar type and counting selected groups of species.

Effective for many beetle families, many plant bug groups and most other insects that live in vegetation of this type, but not those restricted to lower levels such as the litter layer.

BEATING

A cloth tray, held on a folding frame, is positioned below branches of trees or bushes and these are sharply tapped with a stick to dislodge insects. Black or white trays are commercially available, but an up-turned umbrella can be just as effective. Insects are collected from the tray using suction device known as aooter.

Effective for almost all arboreal species, including many beetle groups, bugs, caterpillars of Lepidoptera, spiders and others.

MALAISE-TRAPPING

A tent-like net is erected in the habitat to be sampled. Insects collide with the central net wall and are funnelled upwards to a catching chamber. This method almost always generates huge volumes of material and several days are normally required to sort and identify material from a single trap session. Traps are usually left all year and catching chamber emptied fortnightly or monthly.

Extremely effective for all flying insects, often catching species that have not been found by any other method.
SIEVING LITTER

Samples of leaf-litter are collected and put through a series of sieves with progressively smaller grids. The technique is especially effective for a variety of beetles in woodlands, but also of great use in sampling invertebrates from reed beds.

LIGHT-TRAPPING

Mercury-vapour (mv) light bulbs are used to attract nocturnal insects - especially moths. These bulbs emit ultra-violet light at a wavelength that causes moths to be attracted. The bulbs are mounted over catching chambers filled with cardboard egg-trays and moths entering the chambers settle on these trays and may be examined. Bulbs are powered from mains electricity or by portable generators.

Because traps need to be run all night, and because each trap costs in the order of £300 and each generator in the order of £600, security is a major consideration when deciding whether to use this technique.
14H  Aquatic plants, habitats and invertebrates Survey
AQUATIC PLANTS, HABITATS AND MACROINVERTEBRATES ASSOCIATED WITH A SECTION OF THE REGENTS CANAL AND ADJACENT PONDS - KINGS CROSS

JUNE 2002

Dr Philip Kerrison and Jill Brown
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41 Park Lane
Norwich, NR2 3EF, UK

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1 INTRODUCTION

1.1 STUDY AREA, AIMS AND OBJECTIVES

The survey covered wetland and open water habitat associated with the Grand Union canal and a series of ponds in the Kings Cross area of London. The water bodies lie within the area affected by construction of the Channel Tunnel Rail Link (CTRL) and terminal. The aim was to assess the nature conservation value of aquatic assets within or close to the Kings Cross Central site proposed for redevelopment following completion of the CTRL and terminal. Surveys of habitat, aquatic vegetation (emergent and marginal) and macroinvertebrate distribution were carried out, with particular attention paid to rare or notable species. Fieldwork at the following sites was carried out on 16 October 2001 in generally dry and sunny weather:

- Two ponds within an enclosure off Goods Way (TQ 301835)
- Single pond within Carney Street Conservation Area (TQ 300835) - second pond mentioned in the brief was very small and could not be sampled
- 1.25 km stretch of the Grand Union Canal (TQ 299837 - TQ300835)

It should be noted that the plant growing season (May – September) is the optimum period for surveying, when vegetation is in good condition with flowers and fruits available as diagnostic features. Water Crowfoots (Ranunculus spp.) and Starworts (Callitriche sp) are particularly difficult to classify without flowers and fruits, and although the weather had been clement, no fruits were found. Callitriche identification to species level was therefore not possible. Salix spp. were also difficult to classify in the absence of flowers and with deteriorating leaves.

1.2 BIOTIC INDICES - ASSESSING WATER QUALITY AND CONSERVATION VALUE

Temperature, flow regime, habitat diversity and water quality affect the distribution of aquatic macroinvertebrates. Flow regime determines the nature of the lotic habitat through the combined effects of current velocity and geology on substrate particle size. In contrast, the characteristics of lentic environments, which usually feature depositing habitats, reflect the influence of temperature, depth and water chemistry on nutrient transport within the ecosystem.

Aquatic ecosystems that feature a range of habitat types as well as good water quality are colonised by a range of plant and invertebrate species. These interact and are inter-dependent, many macroinvertebrate species depending on aquatic plants for cover, food and egg laying surfaces. In consequence, high species diversity is invariably associated with high habitat diversity and vice versa. Under natural conditions, fluctuations in community structure occur throughout the year, as populations progress through their life cycles, but these are minor compared with the disruption that can occur when pollutants enter the water body or when
the channel is unsympathetically managed. These activities can seriously disrupt the ecosystem and set up conditions in which pollution-tolerant 'nuisance' monocultures can establish.

By studying the benthic macro-invertebrate and other aquatic communities and noting the relative abundance of pollution tolerant and susceptible species, it is possible to make judgments about the quality of the water in a water body (Armitage et al., 1983). Government agencies and other bodies regularly carry out such surveys, and to enable the data to be understood by non-specialists, reduce the complex inter-relationships within the macro-invertebrate community, to single biotic indices. Species diversity indices indicate whether the community comprises many individuals of few species, or fewer individuals of a greater range of species. The latter indicates a well-balanced community.

The indices most widely used in the UK water industry are the 'biological monitoring working party' (BMWP) score and the associated 'average score per taxon' (ASPT). These incorporate macroinvertebrate data and have been developed exclusively for flowing waters to enable the quality of river or stream water to be determined in a reliable and reproducible way. Identification of macro-invertebrates to family level is generally considered adequate when community data are to be summarised by these scores.

**BMWP Score** - In the late 1970's, water authority biologists and other aquatic ecologists allocated scores between 1 and 10 to various families of benthic macro-invertebrates colonising flowing freshwater habitats. The value reflects a family's sensitivity to organic pollution. Summing the individual scores derives the BMWP Score for a site.

**ASPT** - dividing BMWP Score by the number of scoring taxa derives ASPT and indicates the average sensitivity of the animals in a sample. The main advantages of the ASPT are that unlike the BMWP Score, it does not increase with sampling effort, and is not markedly greater at habitat-diverse sites than at homogeneous sites.

**Predictive Methods** - Changes in biotic scores reflect the response of biological communities to environmental changes caused primarily by organic pollution. However, temporal and spatial factors can influence aquatic communities by way of variables such as location, discharge, current velocity, sediment deposition, temperature and water chemistry. It is therefore important to distinguish these effects from pollution. RIVPACS (River Invertebrate Prediction and Classification System) has been developed for flowing waters. In the 1980's, the Institute of Freshwater Ecology collated macro-invertebrate community data from a range of unpolluted streams throughout the UK (Armitage et al., 1983, Purse et al., 1984, Wright et al., 1984, Moss et al., 1987). Software was later developed to enable assemblages likely to occur at unpolluted sites to be predicted on the basis of spatial parameters such as altitude, latitude, distance from source, slope, stream order, mean depth, mean width (supplemented where appropriate by physico-chemical variables).

**Conservation Value** - Predictive methodologies are able to suggest suites of species suited to a site, based on location and key physico-chemical features. However, many organisms require not only good quality water, but also
appropriate habitat. The evaluation of conservation value or potential should therefore incorporate habitat assessment. It should also be remembered that although family-level identification may be adequate for water quality assessment, it is not sufficient when evaluating conservation value, for which, individual components must be catalogued fully. This entails identifying to species wherever possible.

The conservation potential of a site may be under-rated by predictive methods based on conditions existing at the time of sampling, as degradation caused by past management is not accounted for. For example, habitat loss and flow changes caused by unsympathetic management can alter mean particle size, causing a target community appropriate to the degraded channel to be generated. Finding a predicted suite of organisms would indicate good water quality but fail to show that the community was depleted due to poor habitat.

At present, there is no index of conservation value, which integrates the full range of macro-invertebrates occurring in aquatic habitats. However, various systems are being researched within the Environment Agency. English Nature's Guidelines for selection of biological Sites of Special Scientific Interest (SSSI's) (Nature Conservancy Council, 1989) contains a section on the classification and protection of freshwater ditches and streams. The British Invertebrate Red Data Books (Shirt 1987, Bratton, 1991) classify aquatic invertebrates as Endangered, Vulnerable or Rare and Table 2 presents the definitions of RDB categories and Nationally Notable categories (Hyman, 1982). The only United Kingdom legislation which provides protection to individual species is the Wildlife and Countryside Act, 1981. Invertebrates listed in Schedule 5 of the Act and which live in freshwater for part or all of their lives include Norfolk Aeshna Dragonfly (Aeshna isosceles), Medicinal Leech (Hirudo medicinalis), Glutinous Snail (Myxas glutinosa), Freshwater Pearl Mussel (Margaritifera margaritifera), Apus (Triops cancriformis), Fairy Shrimp (Chirocephalus diaphanus) and the native or Atlantic Stream Crayfish (Austropotamobius pallipes).

The United Kingdom has ratified the Bern Convention on the Conservation of European Wildlife and Natural Habitats. This further protects three of the above freshwater invertebrates (H. medicinalis, M. margaritifera and A. pallipes). At present there are no freshwater invertebrates protected under the Convention on International Trade in Endangered Species (CITES).

Two of the above freshwater invertebrates are also included in Annex II of the EC Habitats Directive (Directive 92/43/EEC) as translated into UK law under the Conservation (Natural Habitats &c.) Regulations 1994, A. pallipes, and M. margaritifera.
Table 1: Threatened and scarce species and water quality definitions

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Red Data Book species</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Endangered</strong></td>
<td>Taxa in danger of extinction (in the UK) and whose survival is unlikely if the causal factors continue. Included are taxa which are known only as a single population in only one 10-km square; taxa which only occur in habitats known to be especially vulnerable; and taxa which have shown a continuous decline over the last 20 years and now exist in five or fewer 10-km squares.</td>
<td>RDB1</td>
</tr>
<tr>
<td><strong>Vulnerable</strong></td>
<td>Taxa believed likely to move into the Endangered category in the near future. Included are taxa of which most or all the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations that have been seriously depleted and whose ultimate security is not yet assured; and taxa with populations that may still be abundant but are under threat from serious adverse factors throughout their range.</td>
<td>RDB2</td>
</tr>
<tr>
<td><strong>Rare</strong></td>
<td>taxa with small populations, which are not at present Endangered or Vulnerable, but are at risk. These taxa are usually localised within restricted geographical areas or habitats, or they are thinly scattered over a more extensive range. Usually, such taxa are not likely to exist in more than 15 10-km squares of the National Grid. This criterion may be extended where populations are likely to exist in more than 15 10-km squares but occupy small areas of especially vulnerable habitat.</td>
<td>RDB3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nationally Notable (scarce) species</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category A</td>
<td>taxa which do not fall within RDB categories but which are nonetheless uncommon in Great Britain and thought to occur in 30 or fewer 10-km squares of the National Grid, or, for less well recorded groups, within 7 or fewer vice-counties.</td>
<td>Notable (A)</td>
</tr>
<tr>
<td>Category B</td>
<td>taxa which do not fall within RDB categories but which are nonetheless uncommon in Great Britain and thought to occur in between 31 and 100 10-km squares of the National Grid, or, for less well recorded groups, within between 8 and 20 vice-counties.</td>
<td>Notable (B)</td>
</tr>
</tbody>
</table>
### Biological Monitoring Working Party Score and RIVPACS systems

<table>
<thead>
<tr>
<th>BMWP Score is used to assess the biological quality of watercourses. The scoring system requires family-level identification of macroinvertebrates, with the highest score of 10 being allocated to those families, which are found in unpolluted water. The lowest score of 1 is allocated to oligochaete worms, which are uniquely tolerant of pollution. The BMWP Score system was developed for environmental monitoring, particularly for measuring change over time at a site. It is not appropriate for the assessment of conservation value or potential. The RIVPACS system enables the expected macroinvertebrates community (and associated BMWP Score) to be calculated from key physico-chemical variables at a site (distance from source, current speed, water hardness, alkalinity and others). Watercourses which are slow flowing with a uniform unstable substrate will have a lower expected BMWP than those with diverse substrates, microhabitats, and current speeds ranging from high in the central channel to low in the margins.</th>
<th>BMWP Score</th>
</tr>
</thead>
</table>
2 METHODOLOGY

2.1 Aquatic Vascular Plants

*Regents Canal* — Physical features, aquatic/emergent plants and macroinvertebrates were sampled and recorded along a 1.25-km stretch of the Regents Canal. Habitat was assessed from the northern bank as this was accessible to the public, by recording vegetation and species of conservation interest, with emphasis on aquatic, emergent and marginal species. A search was made for submerged plants at various points along the channel, with a grapnel thrown from the bank.

*Ponds* The five ponds specified in the original brief were visited with the aim of assessing their conservation value using the PSYM (Predictive SYstem for Multimetrics) methodology (Environment Agency, 1999).

Two of the specified ponds (A and B) were in the Camley Street Natural Park. Pond B was a small raised artificial water garden and of little conservation value. Pond A was a two-lobed water body with a boardwalk bridge visually separating the lobes. The entire pond was separated from the adjacent Regents Canal by a wooden barrier/sluice that controlled water flux between the two waterbodies.

The two ponds (C and D) at Goods Way were within a small overgrown area. An area of open water remained at the centre of pond C but pond D was virtually dry.

At both the Camley Street and Goods Way sites, submerged plant material within reach of the bank was collected with a four-pronged grapnel on a pole. A four-pronged grapnel on a rope was used to sample below the surface in areas of open water further from the banks. Physical characteristics and conservative water quality data (pH conductivity, temperature and dissolved oxygen concentration) were recorded for each water body, together with any casual sightings of mammals, waterfowl and fish.

The entire margin of each pond was surveyed to establish the location and abundance of free-floating and emergent species, as well as any submerged species visible from the surface. An abundance score for each species was estimated on the DAFOR scale as follows:

- **R** (rare) = one fragment,
- **O** (occasional) = several fragments to 30% rake full,
- **F** (frequent) = one third to half-full rake,
- **A** (abundant) = over half-full to 90% full rake,
- **D** (dominant) = full to overflowing rake.
- **LA/LF** = Locally abundant/Locally frequent

Individual abundance scores were used to derive an overall DAFOR abundance score for each species for the whole water body.
Plant nomenclature follows Stace (1997) and common names are as in Dony et al. (1986).

2.2 Aquatic macroinvertebrates

Under natural conditions, macroinvertebrate populations fluctuate throughout the year as their life cycles progress, and it should be noted that sampling in one season alone does not produce a comprehensive catalogue of species.

Semi-quantitative samples were collected with a standard hand net (frame size 0.35m x 0.25m, net depth 0.3m, mesh 1mm) sweep-sampling from the bank with a pole extension attached to the net following the Environment Agency's standard methodology. The full range of available habitats (emergent plants at the margins, submerged aquatic vascular plants and other substrate within the channel) was sampled. Substrate was agitated to dislodge invertebrates, which were swept into the net. Muds were sampled in a similar way and washed gently within the water body to removed fine silts. Preliminary observations of each sample were made on the bank before transferring the sample to double thickness polyethylene bags to which 20 cm$^3$ of formalyn was added. Air was expelled from the bags which were then tied and placed in rigid polyethylene buckets for protection during transport.

In the laboratory, samples are sieved to flush out preservative and remove larger detritus and plant debris before being placed in a small amount of water in a white plastic tray for sorting. Sorting involves separating macro-invertebrates from detritus and other benthic material. Specimens are examined for diagnostic detail with a binocular microscope and identified with the aid of keys published by the Freshwater Biological Association (FBA), the Linnean Society of London and others. They are then preserved in IMS. Suites of species are produced for each replicate at each site. Entire samples were sorted to ensure that the rarer taxa are included, and all preserved material retained.

Since only four samples were collected during the survey (3 pond samples, 1 canal sample), it was decided to despatch the pond samples to the Centre for Ecology and Hydrology (CEH) for sorting and identification rather than sorting in-house and carrying out internal and external AQc procedures. The canal sample was processed in-house.

2.3 Physico-chemical variables

The following conservative physico-chemical variables were analysed on site with hand held meters:

1) Dissolved oxygen concentration (mg/l)
2) Electrical conductivity (u Siemens)
3) pH (pH units)
4) Temperature °C
3 SURVEY DATA

3.1 Pond at Camley Street Natural Park

Figure 1 – Plan view of Pond A – within Camley Street nature park

Not to scale - measurements approximate – Key overleaf

--- GRAND UNION CANAL ---

Swamp
Gmax (A)
Ipse (LA)
Sere (F)
Saur (F)

Slac (A)
Cyperion (LF)
Ecan (F)
Saur (F)
Aster sp (F)
Secur var (F)

Tlat (A)
Cyperion (F)
Chipo (F)
Ipse (T)
Ecan (Q)
Maqu (Q)

Calil sp. (F)
Maqu (O/LF)
Lemna (O)

Open water
with occ.
Tlat, Maqu,
Sere, Naib

Paus (F)
Sere (F)
Ipse (F)
Laur (F)

Boardwalk/Bridge

Chipo, Sere

N

50m

Key

22m

Aglu, Open, Salix sp. (Scap?)
Buddleja davidii

SS

N

O

- Tree canopy overhanging water surface

SS = Sample point for submerged aquatics (with grabnet)
(4-letter abbreviations follow RCS (River Corridor Survey) approved protocol. 5-letter abbreviations for genus are used where there is no RCS equivalent)

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Scientific Name</th>
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</thead>
<tbody>
<tr>
<td>Aglu</td>
<td>Alinus glutinosa</td>
</tr>
<tr>
<td>Cali sp.</td>
<td>Callitriche sp. (C. obtusangula and/or C. platycarpa)</td>
</tr>
<tr>
<td>Bpen</td>
<td>Betula pendula</td>
</tr>
<tr>
<td>Cacu</td>
<td>Carex acutiformis</td>
</tr>
<tr>
<td>Cave</td>
<td>Corylus avellana</td>
</tr>
<tr>
<td>Carex pse</td>
<td>Carex pseudocyperus</td>
</tr>
<tr>
<td>Cmon</td>
<td>Crataegus monogyna</td>
</tr>
<tr>
<td>Crip</td>
<td>Carex riparia</td>
</tr>
<tr>
<td>Csan</td>
<td>Cornus sanguinea</td>
</tr>
<tr>
<td>Cyper lon</td>
<td>Cyperus longus</td>
</tr>
<tr>
<td>Does</td>
<td>Deschampsia caespitosa</td>
</tr>
<tr>
<td>Ecann</td>
<td>Eupatorium cannabinum</td>
</tr>
<tr>
<td>Ehir</td>
<td>Epilobium hirsutum</td>
</tr>
<tr>
<td>Exc</td>
<td>Fraxinus excelsior</td>
</tr>
<tr>
<td>Gmax</td>
<td>Glycyrrhiza maxima</td>
</tr>
<tr>
<td>Ipse</td>
<td>Iris pseudacorus</td>
</tr>
<tr>
<td>Iaqu</td>
<td>Illex aquifolium</td>
</tr>
<tr>
<td>Leur</td>
<td>Lycopus europaeus</td>
</tr>
<tr>
<td>Ligus ova</td>
<td>Ligustrum ovalifolium</td>
</tr>
<tr>
<td>Lmin</td>
<td>Lemna minor</td>
</tr>
<tr>
<td>Maqu</td>
<td>Mentha aquatica</td>
</tr>
<tr>
<td>Mtri</td>
<td>Menyanthes trifoliata</td>
</tr>
<tr>
<td>Nallb</td>
<td>Nymphaea alba</td>
</tr>
<tr>
<td>Paus</td>
<td>Phragmites australis</td>
</tr>
<tr>
<td>Rfru</td>
<td>Rubus fruticosus agg.</td>
</tr>
<tr>
<td>Romi</td>
<td>Ranunculus aquilegus</td>
</tr>
<tr>
<td>Scap</td>
<td>Salix caprea</td>
</tr>
<tr>
<td>Scin</td>
<td>Salix cinerea</td>
</tr>
<tr>
<td>Sdul</td>
<td>Solanum dulcamara</td>
</tr>
<tr>
<td>Sorbu auc</td>
<td>Sorbus aucuparia</td>
</tr>
<tr>
<td>Secur var</td>
<td>Securigera varia</td>
</tr>
<tr>
<td>Sere</td>
<td>Sparganium erectum</td>
</tr>
<tr>
<td>Saur</td>
<td>Scrophularia auriculata</td>
</tr>
<tr>
<td>Slac</td>
<td>Schoenoplectus lacustris</td>
</tr>
<tr>
<td>Tlat</td>
<td>Typha latifolia</td>
</tr>
</tbody>
</table>
### Table 2  Aquatic and emergent species colonising Camley Street pond A

<table>
<thead>
<tr>
<th>Aquatic</th>
<th>(Stanwort)</th>
<th>DAFOR Abundance Score (and Status)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Callitriche sp.</td>
<td>C. obtusangula and/or C. platycarpa</td>
<td>F, LA</td>
</tr>
<tr>
<td>Lemma minor</td>
<td>(Common duckweed)</td>
<td>F, LA</td>
</tr>
<tr>
<td>Nymphaea alba</td>
<td>(White water lily)</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emergent Species</th>
<th>(Trifid bur-mangold)</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carex acutiformis</td>
<td>(Lesser pond sedge)</td>
<td>O</td>
</tr>
<tr>
<td>Carex pseudocyperus</td>
<td>(Cyperus sedge)</td>
<td>O</td>
</tr>
<tr>
<td>Carex riparia</td>
<td>(Greater pond sedge)</td>
<td>F, LD</td>
</tr>
<tr>
<td>Cyperus longus</td>
<td>(Galingale)</td>
<td>F</td>
</tr>
<tr>
<td>(nationtally scarce)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eupatorium cannabinum</td>
<td>(Hemp agrimony)</td>
<td>O, LF</td>
</tr>
<tr>
<td>Epilobium hirsutum</td>
<td>(Great willowherb)</td>
<td>D</td>
</tr>
<tr>
<td>Glycyrrhiza maxima</td>
<td>(Purple Sweet guss)</td>
<td>A, LD</td>
</tr>
<tr>
<td>Iris pseudacorus</td>
<td>(Yellow flag)</td>
<td>O, LF</td>
</tr>
<tr>
<td>Iris pseudacorus</td>
<td>(Yellow flag)</td>
<td>D</td>
</tr>
<tr>
<td>Lythrum salicaria</td>
<td>(Gipsywort)</td>
<td>D</td>
</tr>
<tr>
<td>Mentha aquatica</td>
<td>(Water mint)</td>
<td>O</td>
</tr>
<tr>
<td>Myosotis scorpioides</td>
<td>(Water forget-me-not)</td>
<td>O</td>
</tr>
<tr>
<td>Phragmites australis</td>
<td>(Common reed)</td>
<td>F</td>
</tr>
<tr>
<td>Scrophularia auriculata</td>
<td>(Water figwort)</td>
<td>F</td>
</tr>
<tr>
<td>Salix alba</td>
<td>(Woolly nightshade)</td>
<td>R</td>
</tr>
<tr>
<td>Sparganium erectum</td>
<td>(Broad-leaved Bur-reed)</td>
<td>F</td>
</tr>
<tr>
<td>Myriophyllum spicatum</td>
<td>(Bugweed)</td>
<td>F, LD</td>
</tr>
<tr>
<td>Schoenoplectus lacustris</td>
<td>(true Bulrush)</td>
<td>A</td>
</tr>
<tr>
<td>Typha latifolia</td>
<td>(Great reedmace or Bulrush)</td>
<td>LA</td>
</tr>
</tbody>
</table>

### Table 3  Conservative physico-chemical variables measured at Pond A

<table>
<thead>
<tr>
<th>Dissolved Oxygen</th>
<th>pH</th>
<th>Conductivity uS</th>
<th>Temperature oC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pond A</td>
<td>6.6 mg/l</td>
<td>7.9</td>
<td>50 uS</td>
</tr>
</tbody>
</table>
3.2 Pond at Goods Way

Figure 2  Plan view of Goods Way ponds C and D

Not to scale - measurements approximate
Key as for Camley Street pond (see section 3.1)

Dense trees and scrub and small

Aglu(A), Salix sp (S. pentandra?) (F), Rhus(F),
Scam(R), Sorbus auc(O), Cava (O), Cmon (R),
Petx(O), Csan(O), Cave(O), laqu(O), Sdul(R), Ligc eva(R), Bpen (O)

--- PLATORM 6m ---

--- 11m ---

--- 15m ---

--- Wall enclosing site ---

Populus x canadensis
"Sorrelia" (?) (R)
(sucker/sapling)

Doos(O)

Maqu (R)
Leur (O)
Canex pea (R)

--- Retaining Wall ---

Pond D virtually dry

Area overgrown with Buddleja
and surrounding Salix sp. and Sorbus aucuparia,
With understory Hedera helix dominated

--- Boundary Wall ---

Vopu(O)

--- GUC ---
3.2.2 Aquatic and emergent species colonising ponds C and D

Table 4  Aquatic and emergent species colonising Goods Way pond C

<table>
<thead>
<tr>
<th><strong>Aquatic Species</strong></th>
<th><strong>Emergent Species</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lemna minor</td>
<td>Carex pseudocyperus</td>
</tr>
<tr>
<td>Nymphaea alba</td>
<td>(Common Duckweed)</td>
</tr>
<tr>
<td></td>
<td>(White Water Lily)</td>
</tr>
<tr>
<td>(Common Duckweed)</td>
<td>R</td>
</tr>
<tr>
<td>(White Water Lily)</td>
<td></td>
</tr>
</tbody>
</table>

^ = uncommon species

Table 5  Conservative physico-chemical variables measured at Pond C

<table>
<thead>
<tr>
<th></th>
<th>Dissolved Oxygen</th>
<th>pH</th>
<th>Conductivity uS</th>
<th>Temperature °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pond D</td>
<td>4.0 mg/l</td>
<td>7.4</td>
<td>1840 uS</td>
<td>13.4°C</td>
</tr>
</tbody>
</table>

3.3 Regents Canal

No submerged aquatic vegetation was recorded. Emergent vegetation was limited to occasional specimens of Sparganium erectum – branched bur-reed along the west/south bank close to York Way.

Table 6  Conservative physico-chemical variables measured on the Grand Union Canal

<table>
<thead>
<tr>
<th></th>
<th>Dissolved Oxygen</th>
<th>pH</th>
<th>Conductivity uS</th>
<th>Temperature °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUC</td>
<td>6.4 mg/l</td>
<td>7.9</td>
<td>730 uS</td>
<td>15.2 °C</td>
</tr>
</tbody>
</table>
### 3.4 Aquatic macroinvertebrates – Ponds and Regents Canal

#### Table 7 Benethic aquatic macroinvertebrates colonising standing water habitat close to Kings Cross Rail Terminal – October 2001

<table>
<thead>
<tr>
<th>Subclass</th>
<th>Order</th>
<th>Family</th>
<th>Genera</th>
<th>Ponds</th>
<th>Goodway</th>
<th>Camley St</th>
<th>Canal - GULC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polychaeta (7)</td>
<td>Polychaeta (7)</td>
<td>Holocerocephalus piscatorius</td>
<td>r</td>
<td>r</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Lumbricidae)</td>
<td>Lumbricidae</td>
<td>Lomberidium penicillum</td>
<td>p</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Oligochaeta)</td>
<td>Oligochaeta</td>
<td>Planaria warren</td>
<td>p</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asellus aquaticus</td>
<td>Asellidae</td>
<td>Asellus aquaticus</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Austrobaileyella peripatus</td>
<td>Austrobaileyellidae</td>
<td>Austrobaileyella peripatus</td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daphnia spp.</td>
<td>Daphniidae</td>
<td>Daphnia pulex</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ephemeroptera</td>
<td>Ephemeroptera</td>
<td>Ephemera danica</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Trichoptera)</td>
<td>Trichoptera</td>
<td>Hydropsyche helvetica</td>
<td>r</td>
<td>r</td>
<td>r</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Nematoda)</td>
<td>Nematoda</td>
<td>Notonecta glauca</td>
<td>r</td>
<td>r</td>
<td>r</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Collembola)</td>
<td>Collembola</td>
<td>Nymphula</td>
<td>r</td>
<td>r</td>
<td>r</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plecoptera</td>
<td>Plecoptera</td>
<td>Plecoptera sp.</td>
<td>r</td>
<td>r</td>
<td>r</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Ephemeroptera)</td>
<td>Ephemeroptera</td>
<td>Baetis sp.</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Hemiptera)</td>
<td>Hemiptera</td>
<td>Calopterygidae</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Diptera)</td>
<td>Diptera</td>
<td>Chironomidae</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
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<tr>
<td>(Odonata)</td>
<td>Odonata</td>
<td>Lestidae</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Hymenoptera)</td>
<td>Hymenoptera</td>
<td>Apidae</td>
<td>p</td>
<td>p</td>
<td>p</td>
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<td></td>
</tr>
<tr>
<td>(Neuroptera)</td>
<td>Neuroptera</td>
<td>Trichoptera</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Conchostraca)</td>
<td>Conchostraca</td>
<td>Conchostraca</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Branchiopoda)</td>
<td>Branchiopoda</td>
<td>Branchiopoda</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Gastropoda)</td>
<td>Gastropoda</td>
<td>Helicidae</td>
<td>p</td>
<td>p</td>
<td>p</td>
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<td></td>
</tr>
<tr>
<td>(Bivalvia)</td>
<td>Bivalvia</td>
<td>Mytilidae</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Crayfish)</td>
<td>Crayfish</td>
<td>Potamidae</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Amphipoda)</td>
<td>Amphipoda</td>
<td>Gammaridae</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Isopoda)</td>
<td>Isopoda</td>
<td>Lophogastridae</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Annelida)</td>
<td>Annelida</td>
<td>Polychaeta</td>
<td>p</td>
<td>p</td>
<td>p</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Summary Statistics**

- **UMW** Score: 65 39 77 20
- **BNWNP Taxa**: 19 10 19 6
- **ASPT**: 4.47 3.00 4.05 3.33

(r = 1, p = 2, c = 3, t = 10, a = 101-1000, u = 1000+)
4 EVALUATIONS

4.1 Gamley Street - Pond A

4.1.1 Habitat Distribution

The pond was an attractive wildlife feature in an urban conservation area, used for recreation and education. Its dimensions were approximately 70m x 18m with water depth 0.3 m with most of the margin gently shelved. A boardwalk crossed the middle of the pond and provided easy access for educational pond dipping. The pond was fed and/or drained (depending on water levels) by a rudimentary weir which separated it from the Grand Union Canal. The pond was visually separated from the canal by a fringe of osier-type willows (Salix sp.) along the canal embankment.

The water body was clear with no surface oil films and was slightly alkaline (pH 7.9). The base appeared to be composed of clay with some sand and gravel and a 10-cm layer of silt. A footpath ran around about half the margin of the pond and this was clear of vegetation although trees overhung much of the perimeter and covered about 40% of the water surface. The surrounding trees gave the pond seclusion and provided cover for birds and potential cover for amphibians. A coot and a moorhen were feeding on the pond.

4.1.2 Aquatic plants

Callitriche sp. and filamentous algae (probably Cladophora sp.) were the main components of the submerged aquatic flora, with Callitriche covering about 5-10% of the pond base. There were possibly 2 species of Callitriche - C. obtusangula with possibly C. peltocarpa, but as neither flowers nor fruits were present, positive identification was not possible. Growth of filamentous algae was very vigorous in places. Floating aquatic flora - Nymphaea alba - white water lily (one large area and one very small plant) and Lemma minor - common duckweed covered the surface of one end of the pond.

4.1.3 Emergents

The pond supported a rich emergent flora which covered about 40% of the water surface. Monocotyledons included the uncommon species Schoenoplectus lacustris - 'true' bullrush and Cyperus longus - galingale (nationally scarce and 'at risk'), which were almost certainly planted. Phragmites australis - common reed, Typha latifolia - great reedmace or bulrush, Sparganium erectum - branched bur-reed, and Cyperus maximus - reed sweet grass at the margins. There was also some Iris pseudacorus - yellow flag and Carex riparia - greater pond sedge.

The most notable emergent dicotyledon was Myriophyllum spicatum - bogbean which was extensive at the south-eastern end of the pond. Mentha aquatica - water mint, Lycopus europaeus - gipsywort, Myrtus communis - water forget-me-not and Apium nodiflorum fowl's water cress colonised the margins and extended into the waterbody.
4.1.4 Marginal vegetation

Emergent monocotyledons, particularly *Sparganium erectum* - branched bur-reed and *Carex riparia* - greater pond sedge extended into a broad band of marsh around much of the eastern perimeter of the pond. *Carex acutiformis* - lesser pond sedge and *Glyceria maxima* - reed sweet grass colonised the margins of the marshy northern end of the pond, where at one point a fringe of *Carex pseudocyperus* - cyperus sedge grew at the water’s edge under *Salix caprea* - goat willow and *Alnus glutinosa* - alder. The wetland dicotyledons *Scrophularia auriculata* - water figwort, *Epilobium hirsutum* and *Eupatorium cannabinum* - hemp agrimony also occurred at the margins. The aliens, *Securigera varia* - crown vetch and *Aster sp.* - michaelmas daisy also occurred frequently.

Beyond the margins, ground level rose and the surrounding vegetation became woodland. There was a small area of deciduous woodland on a fairly steep bank at the south-east end of the pond, and tree species (*Alnus glutinosa* - alder, *Fraxinus excelsior* - ash, *Salix spp.* - willows, *Betula pendula* - birch, *Prunus sp.* - cherry and *Ulmus sp.* - elm) overhung the south-west border. A line of willows fringed the canal. These were probably hybrids - *S.x meyeriana* (*S.fragilis* x *S.pentandra*) or *S.x ehrhartiana* (*S.alba* x *S.pentandra*), or *S.x rubens* (*S.alba* x *S.fragilis*).

4.1.5 Macroinvertebrates

Table 8: Aquatic macroinvertebrate distribution within Camley Street pond (A) and associated biotic scores

<table>
<thead>
<tr>
<th>BMWP Score</th>
<th>Family</th>
<th>Species</th>
<th>Pond A</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Chironomidae</td>
<td>Conagron puria</td>
<td>p</td>
</tr>
<tr>
<td>7</td>
<td>Polycentropodidae</td>
<td>Hololeptus paulina</td>
<td>r</td>
</tr>
<tr>
<td>6</td>
<td>Gammaridae</td>
<td>Gammassus phila</td>
<td>a</td>
</tr>
<tr>
<td>5</td>
<td>Anapoidea</td>
<td>Anapoidea fimbria</td>
<td>p</td>
</tr>
<tr>
<td></td>
<td>Hydropsychidae</td>
<td>Hydropsyche fimbria</td>
<td>r</td>
</tr>
<tr>
<td></td>
<td>Corixidae</td>
<td>Corixidae fossarum</td>
<td>r</td>
</tr>
<tr>
<td></td>
<td>Notonectidae</td>
<td>Notonecta glauca</td>
<td>p</td>
</tr>
<tr>
<td></td>
<td>Plecoptera</td>
<td>Planorba tena</td>
<td>p</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Planorba laeviterga</td>
<td>p</td>
</tr>
<tr>
<td></td>
<td>Plecoptera</td>
<td>Planorba spinata</td>
<td>r</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Planorba concinnus</td>
<td>c</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Planorba lacvis</td>
<td>r</td>
</tr>
<tr>
<td></td>
<td>Hydroptilidae</td>
<td>Bithynia leachi</td>
<td>p</td>
</tr>
<tr>
<td></td>
<td>Valvataidae</td>
<td>Valvata piramatic</td>
<td>c</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Valvata misella</td>
<td>c</td>
</tr>
<tr>
<td></td>
<td>Physidae</td>
<td>Physa acuta</td>
<td>p</td>
</tr>
<tr>
<td></td>
<td>Sphaeriidae</td>
<td>Sphaerium concum</td>
<td>c</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Podisma sp.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Asellidae</td>
<td>Asellus aquaticus</td>
<td>c</td>
</tr>
<tr>
<td></td>
<td>Branchiuridae</td>
<td>Branchiura aquatica</td>
<td>p</td>
</tr>
<tr>
<td></td>
<td>Glossiphoniidae</td>
<td>Helobdella stagnalis</td>
<td>r</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Glossiphonina helobdella</td>
<td>p</td>
</tr>
<tr>
<td>2</td>
<td>Chromyidae</td>
<td>Chromый sp.</td>
<td>c</td>
</tr>
<tr>
<td>1</td>
<td>Oligochaeta</td>
<td>Tubificidae</td>
<td>r</td>
</tr>
<tr>
<td>0</td>
<td>Lumbricidae</td>
<td>Lumbricidae stagnalis</td>
<td>c</td>
</tr>
<tr>
<td></td>
<td>Nematoda</td>
<td>Nematoda arcuata</td>
<td>r</td>
</tr>
<tr>
<td></td>
<td>Diptera</td>
<td>Daphnia sp.</td>
<td>p</td>
</tr>
</tbody>
</table>

BMWP Score // ASPT 4.00
Tara 19 (r = 1, p = 2-10, c = 11-100, a = 101-1000)
Habitat within the pond was depositing, and the resident macroinvertebrates were generally adapted to exploit the detritus and decomposing material associated with quiescent conditions. These included leeches (*Hirudo tentaculata* and *Helobdella stagnalis*, *Glossiphonia* *heteroclitia*), the burrowing filter-feeding bivalve *Spheiridium corneum*, chironomid larvae and the flatworm *Planaria torva* (Table 8). The isopod *Asellus aquaticus* and the amphipod *Gammarus pulex* occurred in large numbers, and several mollusc species, bugs and a single beetle species colonised vegetation at the fringes. In addition, the widely distributed damselfly *Coenagrion puella* had established a population.

4.1.6 Nature Conservation Interest

The Camley Street reserve is a mainly man-made habitat developed on former industrial land. The pond supports a varied and structurally diverse flora. This includes native species such as *Monanthos trifoliate* - bogbean and uncommon emergents such as *Cyperus longus* - galingale which a classified nationally scarce and "at risk". It was probably planted in the park, as was the "true" bulrush, *cyperus sedge*, bogbean and white water lily (uncommon in natural habitat). Although the pond otherwise supports generally common aquatic and emergent plant communities it is species-rich and on botanical interest. The plants contribute structural diversity to the aquatic habitat, and the pond is likely to be important for breeding amphibians. The wetland habitat provides a refuge in central London for birds, amphibians and invertebrates, and has education and amenity value.

Plant species ratings derived by the PSYM methodology are as follows: twenty-two relevant species scored 4 on the uncommon species list and 8.62 on the trophic ranking (i.e. fairly eutrophic).

One of the mollusc species colonising the pond, *Physa acuta*, is a non-native species probably introduced from the Mediterranean region and often associated with ponds warmed by inputs of condenser water from industrial processes. *Planorbis laevis* (possibly *P. dilatatus*?) is also not widely distributed in the south of England. Beetle and bug species also exploited the available vegetation for shelter, egg laying surfaces and food. Physico-chemical conditions were within the ranges expected for lowland canals and ponds.

For the purposes of the PSYM assessment:

ASPT = 4.05,
Number of dragonfly and alderfly taxa = 1 (*Coenagrion puella*)
Number of beetle families = 1 (*Hydrophilidae*)
pH = 7.9

None of the macroinvertebrate species was of particular conservation importance.
4.2 Goods Way - Ponds C and D

4.2.1 Vegetation

The site had been developed as an urban conservation area with a partially man-made pond with wooden platforms for net dipping. It was smaller than the Camley Street pond and had become overgrown. The smaller of the two ponds had filled with litter, whilst the other had been virtually completely invaded by Phragmites australis - common reed with some Myosotis scorpioides - water forget-me-not and Iris pseudacorus - yellow flag. The pond retained little wetted area (0.15m deep), although open water near the centre supported Lemna minor - common duckweed, a small white water lily (Nymphaea alba) and a small specimen of Ranunculus aquatilis - round-leaved crowfoot.

Remains of Lemna minor higher up the bank suggested a recent sudden drop in water level caused possibly by a tear in the liner. Newt trapping and relocation had been carried out recently and lining material was found on the wooden access platform. The pond was surrounded with trees (Alnus glutinosa - alder and Salix) and shrubs (see Figure 2). In open areas, plants adapted to exploit damp conditions thrive (Droschampsia caespitosa - tufted hair grass, Lycopterus europaeus - gipsywort, and Carex pseudocyperus - cyperus sedge).

4.2.2 Macroinvertebrates

Habitat within the pond was marshy with only a small area of open water remaining within the boundary of the pond. The aquatic habitat was depositing and as with the Camley Street pond, resident macroinvertebrates were adapted to exploit the detritus and decomposing material associated with quiescent conditions. The mayfly Centroptilum pennumatum (found typically amongst vegetation of slow flowing waters) was present as were the leeches Erpobdella octoculata and Glossiphonia complanata, the burrowing filter-feeding bivalve Sphaerium corneum, chironomid larvae and the Ihlaworm Dugesia lugubris (Table 9). The isopod Asellus aquaticus and the amphipod Gammarus pulex occurred in large numbers, and several mollusc species, bugs and a single beetle species were found among the emergent vegetation. In addition, the widely distributed damselfly Coenagrion puella had established a population and an immature crayfish (Astacidae) was found at the site. The site had been neglected for many months but even so, the community associated with pond C was as diverse as that within the pond at Camley Street (A).
Table 9 Aquatic macroinvertebrate distribution within Goods Way pond (C) and associated biotic scores

<table>
<thead>
<tr>
<th>BMWP Score</th>
<th>Family</th>
<th>Species</th>
<th>Pond C</th>
<th>Pond D</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Cobitidae</td>
<td>Cobitis puella</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Actaeidae</td>
<td>Ameiurus melas</td>
<td>r</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Goeldiidae</td>
<td>Hydropsyche alpestris</td>
<td>r</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Coenagrionidae</td>
<td>Coenagrion puella</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Ceratopogonidae</td>
<td>Ceratopogon piscatorius</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Hydroporinae</td>
<td>Hydrometra puella</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Hemiptera</td>
<td>Laccifer laccifer</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Baetidae</td>
<td>Baetis rhodani</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Lestidae</td>
<td>Lestes sponsa</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Lestidae</td>
<td>Lestes sponsa</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Tanypodidae</td>
<td>Ecdyonurus strigatus</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Oligochaeta</td>
<td>Lumbriculus</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Leptodora</td>
<td>Paragammarus strigalis</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Hemiptera</td>
<td>Empoepis auripennis</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Oligochaeta</td>
<td>Nectria hoffmeisteri</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Scoyphidae</td>
<td>Daphnia pulex</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Psychodidae</td>
<td>Psychodidae</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Oligochaeta</td>
<td>Lepidora strigata</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Diptera</td>
<td>Daphnia pulex</td>
<td>p</td>
<td></td>
</tr>
</tbody>
</table>

BMWP Score 93  ASPT 4.47  Taxa 19
(r = 1, p = 2-10, c = 11-100, a = 101-1000)

4.2.3 Nature Conservation Interest

Although the flora was not exceptional, the pond has provided breeding habitat for amphibians, and a refuge in central London for birds and other fauna. The site had been invaded with Buddleja but two species, which are not common in the region, had become established - round-leaved crowfoot (Ranunculus aquatilis) and cyperus sedge (Carex pseudocyperus). The cyperus sedge may have been planted. Pots containing roots of water lily plantings were found. Ranunculus aquatilis and Nymphaea alba - classified as uncommon in the PSYM species list - were also noted. Carex pseudocyperus occurred beyond high water level so was not included in the assessments. Physico-chemical conditions were within the ranges expected for lowland canals and ponds.

The PSYM uncommon species score was 2 with a species count of 7 and a trophic rating of B4 (i.e. fairly eutrophic).
A single immature crayfish (Astacidae) was found in pond C at this site. Identification of crayfish to species is only possible in mature individuals with well-developed rostrum and chela. It was therefore not possible to identify this individual more precisely. The possibility that this individual was Atlantic Stream (also known as White-clawed) Crayfish (Astacastomatobius pallipes), which is protected under the Wildlife & Countryside Act 1981 and the Conservation (Natural Habitats & c.) Regulations 1994, was considered. However, this species requires clear, well-oxygenated water and locations without too much sediment and therefore the habitats at Kings Cross were not considered to be suitable. Furthermore, Atlantic Stream Crayfish is not known to occur in central London (Environment Agency, 1999) and it is considered much more likely that this individual was a Narrow-clawed or Turkish Crayfish (Austacus leptodactylus), a non-native species known to occur at more than 20 locations in London.

None of the macroinvertebrate species was of particular conservation importance.

For the purposes of the PSYM assessment:

ASPT = 4.47
Number of dragonfly and alderfly taxa = 1 (Coenagron puella)
Number of beetle families = 1 (Dystiscidae)
 pH = 7.4

4.3 Regents Canal

4.3.1 Habitat and vegetation

The canal section stretched between the York Way road bridge and the Camley Street railway bridge and included a lock towards the Camley Street end. Channel varied in width between 18m and 25m and was around 1.3m deep. The canal corridor was walled on both sides for much of the section with a concrete paved footpath/towpath running along the north bank. Bank side vegetation was limited although some stretches of the south bank were flanked with alder (Alnus glutinosa) and willow (Salix) and willow (Salix viminalis - Osier) most notably where the canal passes by the Camley Street Natural Park. Other Salix species were noted but positive identification was not possible. Occasional plants colonised cracks in the concrete footpath along the east bank (Juncus bulbosus - toad rush, Scutellaria galericulata - skullcap and the invasive alien Fallopia japonica - Japanese knotweed).

After extensive sampling, no submerged aquatic vegetation was recorded. An anger beside the canal confirmed that the channel supported fish, and staff at the Camley Street Natural Park suggested that fish from the canal had depleted the submerged aquatic flora within the reserve and possibly the canal. Emergent vegetation was very limited, as banks were man-made and generally vertical with no shelves on which vegetation could establish. Occasional specimens of Sparganium erectum - branched bur-reed colonised the south bank close to York Way.
4.3.2 Macroinvertebrates

Table 10 Aquatic macroinvertebrate distribution within the GUG channel and associated biotic scores

<table>
<thead>
<tr>
<th>BMWP Score</th>
<th>Family</th>
<th>Species</th>
<th>Regent's Canal</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Unionidae</td>
<td>Anodonta cygnea</td>
<td>p</td>
</tr>
<tr>
<td>5</td>
<td>Limnidae</td>
<td>Elmis aenea</td>
<td>r</td>
</tr>
<tr>
<td>3</td>
<td>Valvataidae</td>
<td>Valvata parvulus</td>
<td>p</td>
</tr>
<tr>
<td>2</td>
<td>Chironomidae</td>
<td>Sphaerium cornum</td>
<td>r</td>
</tr>
<tr>
<td>1</td>
<td>Oligochaeta</td>
<td>(Tubificidae)</td>
<td>a</td>
</tr>
</tbody>
</table>

BMWP Score 20 ASPT 3.33
Taxa 6
(i = 1, p = 2-10, c = 11-100, a = 101-1000)

The canal was straight, slow flowing and deep and the channel bottom unstable and inaccessible. Habitat was generally depositing and macroinvertebrates were limited to species adapted to exploit detritus and decomposing material. However, the crustaceans, beetles (apart from the riffle beetle Elmis aenea) and bugs normally present in quiescent conditions were absent, probably reflecting the dearth of vegetation in the channel. Burrowing filter-feeding bivalves (Sphaerium cornum, and Anodonta cygnea), chironomid larvae and oligochaete worms colonised the mud (Table 10).

4.3.3 Nature Conservation Interest

The aquatic and marginal habitats of the canal have little structural diversity and botanical interest and are of limited nature conservation value. Japanese knotweed should be eradicated as it out competes native flora. However, the mature trees along the south bank enhance the landscape and served as refuges for passing fauna. In doing so, they may inter-link adjacent isolated areas of habitat which otherwise might be unviable. Physico-chemical conditions were within the ranges expected for lowland canals and ponds.

For the purposes of the PSYM assessment:

ASPT = 3.90
Number of dragonfly and alderfly taxa = 6
Number of beetia families = 1 (Elminthidae)
PH = 7.9

None of the macroinvertebrate species was of particular conservation importance.

4.4 Conservation Value of wetland habitat within Kings Cross Redevelopment Area

The unusual flora and structural diversity of the Camley Street Natural Park in the highly urbanised Kings Cross area gives it particular nature conservation value. The wetland habitat of the park and that of the Goods Way site support a range of communities but none of particular conservation interest. However, the habitat
provides valuable oasis in an urban environment. The wetland habitats also have educational and amenity value.
5  BIBLIOGRAPHY AND REFERENCES


Kings Cross – Aquatic HabitatVegetation and Macroinvertebrate survey June 2002


Watson, E.V. (1881) British Mosses and Liverworts, Cambridge University Press

141  Relationship between Core Infrastructure Works and Principal Development Zones
### Table 2
Relationship Between Core Infrastructure Works and Principal Development Zones

| Work No. | Summary Description (see annex B for more information) | A | B | C | D | E | F | I | J | K | L | M | N | O | P | Q | R | S | T | V |
| CW1      | Panoramic Road                                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | R |   |
| CW2      | Station Square                                          |   | L | L |   |   |   | L |   |   | L |   |   |   |   |   |   |   |   | R |   |
| CW3      | LUL Link to development zone B                         |   |   |   |   |   |   |   | L |   |   |   |   |   |   |   |   |   |   |   |   |
| CW4      | Boulevard                                               |   |   |   |   |   |   |   |   |   | L | L |   |   |   |   |   |   |   |   |   |
| CW5      | Panoramic Square                                        |   |   |   |   |   |   |   |   |   |   |   |   | R |   |   |   |   |   |   |   |
| CW6      | Service Road in development zone A                     |   |   |   |   |   |   |   |   |   |   |   |   |   | R |   |   |   |   |   |   |
| CW7      | Route 84 on KCC207                                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   | R |   |   |   |   |   |
| CW8      | Route 85 on KCC207                                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | R |   |   |   |   |
| CW9      | Goodway West                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | R |   |   |   |
| CW10     | Canal Square                                            |   | R | R |   |   |   | L |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW11     | Goodway East                                            |   | R | R |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | L |
| CW12     | Gas Governor Ste                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW13     | West Bridge (BR2)                                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW14     | Canal South Bank Works                                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW15     | East Bridge (BR1)                                      |   | R | R |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | L |
| CW16     | South Square                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW17     | Landscaping area for KCS4                               |   | L | L |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW18     | Route North                                            |   | R | R |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW19     | Canal North Bank                                        |   |   |   |   |   |   |   |   |   | L | L | L | L |   |   |   |   |   |   |   |
| CW20     | Granary Square                                          |   | R | R |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW21     | Public realm around Midland & Regen                    |   | R | L |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW22     | Midland Yard                                            |   | R | R |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW23     | Coal Drops Yard                                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW24     | Transit Street (TS1)                                    |   | R | L |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW25     | Market Square                                           |   |   | L | R | R | R |   |   |   | R | L | L | R | L |   |   |   |   |   |   |
| CW26     | Gas Holders zone                                        |   | R | R |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | R | L | L |
| CW27     | Canal Street South                                      |   |   |   | L | L |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW28     | Goods Street West                                       |   | R | R |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW29     | Canal Street North                                      |   | R | R |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW30     | Long Park                                              |   | R | R |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW31     | Goods Street East                                       |   | R | R | L | R | R | R | L | R | R | L |   |   |   |   |   |   |   |   |   |
| CW32     | York Way                                               |   | L | R | R | R | R | L | L | L | L |   |   |   |   |   |   |   |   |   |   |
| CW33     | York Street                                             |   |   | L | L | L |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW34     | North Square                                            |   |   |   |   |   | L | L | R | R | R |   |   |   |   |   |   |   |   |   |   |
| CW35     | Electrical Sub Station                                  | L | L |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW36     | Dismantle and re-erect Gn No 8                         | R | R |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW37     | Water Supply - off site                                | L | L |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW38     | Divert Camden River                                     |   |   |   |   |   | L |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW39     | Camley St Bridge (BR3)                                  |   |   |   |   |   | L |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CW40     | Relocate Gas Governor                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**R** - Required works - core infrastructure works that are required to be in place before buildings within that zone can be completed and occupied, based upon the assumptions that underpin this Implementation Strategy.

**L** - Likely works - core infrastructure works that are likely to be undertaken, before buildings within that zone are completed and occupied, based upon the assumptions that underpin the Implementation Strategy.