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Transport and Works Act 1992
London Underground (Bank Station Capacity Upgrade) Order

Environmental Statement

September 2014

MAYOR OF LONDON



**TRANSPORT
FOR LONDON**
EVERY JOURNEY MATTERS



Transport and Works Act 1992

London Underground (Bank Station Capacity Upgrade) Order

Environmental Statement

September 2014

Bank Station Capacity Upgrade Project
5th Floor
10 King William Street
London EC4N 7TW

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Glossary and List of Abbreviations

Abbreviation	Definition
AADT	Annual Average Daily Traffic flow
AAWT	Annual Average Weekday Traffic flow
AD	Anno Domini
ADMS	Atmospheric Dispersion Modelling System
ADMS-Roads	ADMS-Roads is a modern dispersion model used to quantify pollution levels at selected receptors
AOD	Above Ordnance Datum. The distance above the mean tides at Newlyn, Cornwall, used by the Ordnance Survey as a reference point for a given level
AQAP	Air Quality Action Plan. A Local Authority produced plan to tackle air quality issues within designated Air Quality Management Areas (AQMA)
AQMA	Air Quality Management Area. Designated under the Local Air Quality Management regime for areas currently, or forecast, to exceed National Air Quality Strategy objectives
ATC	Automatic Traffic Count
ATD	Above Tunnel Datum
AVR	Accurate Visual Representation
Alluvium	Soil deposited by river processes
Ambient	Background levels
Amenity	An element of a location or neighbourhood that helps to make it attractive or enjoyable for residents and visitors
Applicant	The person or organisation seeking consent for development (for example a Transport and Works Act Order, Town and Country Planning Act application)
Aquifer	A below ground, water-bearing layer of soil or rock
Archaeological watching brief	Attendance on site of a suitably qualified or experienced archaeologist during the course of ground excavations, usually working to a brief agreed with the local planning authority
Asbestos	Toxic material historically used as insulation
A-weighted sound pressure level	A logarithmic measure of sound pressure which takes into account the human auditory system's response to the size of changes in sound pressure and differential sensitivity to sounds of different pitches (or frequencies)
BC	Before Christ
BERR	Department for Business, Enterprises and Regulatory Reform
BGS	British Geological Survey
BH#	Built Heritage Asset [Number]. A unique identifier for heritage assets
BODS	Bus Origin Destination Survey
BPM	Best Practicable Means
BRE	Building Research Establishment

Abbreviation	Definition
BREEAM	Building Research Establishment Environmental Assessment Method. Used for rating the environmental performance of buildings
BS	British Standard: specification published by the British Standard Institute
BSCU	Bank Station Capacity Upgrade
BSI	British Standard Institute
Bank Monument Station Complex	The Bank Monument Station Complex is an amalgamation of London Underground stations containing: <ul style="list-style-type: none"> • six lines - District, Circle, Waterloo & City, Central, Northern Lines and the DLR; • five sets of platforms – District & Circle, Waterloo & City, Central, Northern Lines and the DLR terminus; • three existing ticket halls – Central Line (under Bank Junction), Northern Line (under Lombard Street) and Monument (under Monument Junction) as well as the Bloomberg entrance currently under construction for the Waterloo & City Line; and • 15 entrance/exits.
Baseline	Existing environmental conditions present on, or near a site, against which future changes may be measured or predicted
Benchmark	A standard by which something can be measured or judged
Blockade	During the final phases of construction when the new tunnels and infrastructure are connected to the existing network, a period of closure (referred to as a blockade) of the Northern Line will be required between specified points.
Breakers	Pneumatic hammer for breaking through concrete
BSCU Work Sites	All work sites used for the BSCU including the Whole Block Site, the Arthur Street Work Site, and sites used for utilities and protective works.
c.	Circa
CA	Conservation Area. An area designated under Planning (Listed Buildings and Conservation Areas) Act 1990 as being of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance
CAFE	Clean Air For Europe
CAZ	Central Activities Zone
CCTV	Closed Circuit Television
CE&D	Construction, Excavation and Demolition [waste]
CERC	Cambridge Environmental Research Consultants
CIRIA	Construction Industry Research and Information Association
CLEA	Contaminated Land Exposure Assessment
CLP	Construction Logistics Plan

Abbreviation	Definition
CO ₂	Carbon Dioxide. A naturally occurring gas comprising 0.04 per cent of the atmosphere. The burning of fossil fuels releases carbon dioxide fixed by plants many millions of years ago, and this has increased its concentration in the atmosphere by some 12 per cent over the past century. It contributes about 60 per cent of the potential global warming effect of manmade emissions of greenhouse gases
CoCP	Code of Construction Practice. Document providing mitigation to reduce or eliminate adverse effects and enhance beneficial effects
COMAH	Control of Major Accident Hazards
CP	Cross Passage: This will usually be followed by a number which identifies its location i.e. CP1
CRTN	Calculation of Road Traffic Noise
C&I	Commercial and Industrial [Waste]
Cladding	Protective coating or 'shell' of outer most part of a building
Commercial (activity)	Activities involved in buying and selling things, such as office workplaces. Commercial sites are not usually open to the public
Compensation Grouting	Where necessary, compensation grouting may be used to counteract tunnelling induced settlement and involves injecting grout into the ground above the tunnel to compensate for the ground loss at the tunnel face
Conservation	The preservation or enhancement of a species or building/structure
Contamination	Contamination is the addition, or the result of addition, or presence of a material or materials to, or in, another substance to such a degree as to render it unfit for its intended purpose
Controlled Waters	They comprise of all rivers, canals, lakes, ground waters, estuaries and coastal waters to three nautical miles from the shore
Crossrail	A new rail link serving London and covering over 100km of track, with nine new stations, from Maidenhead in the west across to Shenfield and Abbey Wood in the east.
Crushers	Deconstruction plant used to reduce the volume of demolition waste
Cumulative Impacts	Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions
Cycle Route	A signed route for cyclists, varying from purpose-built cycleway to a simple advisory route through lightly trafficked parts of the ordinary road network
DAS	Design and Access Statement. Document explaining the design rationale underpinning the proposed locations, layouts and design for the project
dB	Decibel. The ratio of sound pressures, which we can hear, is a ratio of 106 (one million: one). For convenience, therefore, a logarithmic measurement scale is used. The resulting parameter is called the 'sound pressure level' (Lp) and the associated measurement unit is the decibel (dB). As the decibel is a logarithmic ratio, the laws of logarithmic addition and subtraction apply
dB(A)	The unit of noise measurement (measured on a logarithmic scale), which expresses the loudness in terms of decibel (dB) scale and the frequency factor (A)
DCLG	Department for Communities and Local Government

Abbreviation	Definition
DECC	Department for Energy and Climate Change
DETR	Department for Environment and Transport and the Regions
Defra	Department for Environment, Food and the Rural Affairs
DfT	Department for Transport
DLR	Docklands Light Railway
DMRB	Design Manual for Roads and Bridges
Demolition	Removal/deconstruction of buildings and other structures
Desk (-top) Study	A non-intrusive study and review of all available information pertaining to a site including historical records collated and monitored data and consultation with relevant stakeholders
Dewatering	The removal of water from the soil to enable work to be carried out below the groundwater level
Diffusion tube	Equipment used to monitor local air quality
Directive	European Commission (EC) Directives impose legal obligations on European Member States. They are binding as to the results to be achieved, but allow individual states the right to decide the form and methods used to achieve the results.
Displacement	The extent to which the benefits of a project are offset by reductions of output or employment elsewhere
Dust	Fine particles of solid materials ranging in size from 1 to 75 micron diameter (see British Standard 3405) capable of being re-suspended in air and settling only slowly under the influence of gravity where it may cause nuisance
E	East
EB	East Bound
EA	Environment Agency
EC	European Commission
EDS	Economic Development Strategy
EH	English Heritage
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment. A technique for ensuring that the likely effects of new development on the environment are fully understood and taken into account before the development is allowed to go ahead. It provides a focus for public scrutiny of the project and enables the importance of the predicted effects, and the scope for modifying or mitigating them, to be properly evaluated by the decision-making authority
ELC	European Landscape Convention. Aims to promote landscape protection, management and planning at all scales
EPR	Environmental Permitting Regulations
EPUK	Environmental Protection United Kingdom

Abbreviation	Definition
ES	Environmental Statement. The outcome of the Environmental Impact Assessment presented in a formal document or documents in accordance with EC Directive 85/337. Includes such information that is reasonably required to assess the environmental effects of a development
EU	European Union
Ecology	The study of living organisms in relation to their surroundings
Effluent	A fluid discharged or emitted to the external environment
Emission	A material that is expelled or released to the environment. Usually applied to gaseous or odorous discharges to the atmosphere
Employment Density	Average floor space per person in a given building
Environmental Impact	Positive or negative impact of a project component or activity on the surrounding environment
FORS	Fleet Operator Recognition Scheme
FRA	Flood Risk Assessment
FTE	Full Time Equivalent
Façade	The front of a building, facing onto open space
Fit-out	Finishing the interior of the building
Floodplain	Land adjacent to a watercourse over which water flows, or would flow but for defences in place, in times of flood
Flood Zone	An area at risk from flooding
Footprint	Perimeter of building's ground floor plan
Frequency (Sound)	The rate of repetition of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the Hertz (Hz), which is identical to cycles per second. A thousand hertz is often denoted kHz, e.g. 2 kHz: 2000 Hz. Human hearing ranges approximately from 20 Hz to 20 kHz. For design purposes, the octave bands between 63 Hz to 8 kHz are generally used. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it. For more detailed analysis, each octave band may be split into three one-third octave bands or in some cases, narrow frequency bands
Fugitive dust emissions	Dust emissions escaping from a construction site
GBN	Groundborne Noise
GBV	Groundborne Vibration
GEA	Gross External Area. A measure of office space. The aggregate superficial area of a building taking each floor into account. As described in the RICS/ISVA Code of Measuring Practice (UK), this includes: external walls and projections, internal walls and partitions, columns, piers, chimney-breasts, stairwells, lift wells, tank and plant rooms, fuel stores; whether or not above main roof level and open-sided covered areas and enclosed car-parking areas, terraces etc
GIA	Gross Internal Area. The total area of buildings measured to the internal face of the perimeter walls at each floor level
GLA	Greater London Authority

Abbreviation	Definition
GLHER	Greater London Historic Environment Record
GWDD	Groundwater Daughter Directive
Gantry	An bridged frame for a traveling crane designed to move along two set of tracks
Geology	Study of solid Earth, the rocks of which it is composed, and the processes by which they change.
Geotechnical	[Study] Geotechnical investigations to obtain information on the physical properties of soil and rock around a site.
Grade I Listed Building	A listed building of exceptional interest
Grade II* Listed Building	Particularly significant buildings of more than local interest
Grade II Listed Building	Buildings of special architectural or historic interest
Gross	The sum total without reduction
Ground Reduction	Reducing the level of the ground
Groundwater	Water associated with soil or rocks below the ground surface but is usually taken to mean water in the saturated zone
HA	Highways Agency
ha	Hectare
HDV	Heavy Duty Vehicle (including buses etc.)
HGV	Heavy Goods Vehicle
HM	Her Majesty
HMSO	Her Majesty's Stationery Office
HV	High Voltage
Hz	Hertz: SI unit of frequency which is equal to one cycle per second.
Hazardous	A substance that is potentially damaging to the environment and harmful to humans and other living organisms
Heritage Asset	A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest.
Heritage Site	Site of historic significance
Hoarding	A temporary board fence set up on the perimeter of a building site
Hydrocarbon	An organic compound consisting entirely of hydrogen and carbon
Hydrogeology	The study of geological factors relating to the Earth's water
Hydrology	The study of the movement, distribution, and quality of water on Earth.
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment
ICE	Innovative Contractor Engagement
IfA	Institute for Archaeologists

Abbreviation	Definition
IoA	Institute of Acoustics
ISO	International Organisation for Standardisation
Inert waste	Wastes that do not undergo any significant physical, chemical or biological transformation
In-situ	In the natural, original or appropriate position
Intrusive investigation	An in-depth investigation involving further sampling and analysis, such as the gathering of samples from the ground, walls, ceilings for the detection of contamination, asbestos and or archaeological remains
JSA	Job Seeker's Allowance
KPI	Key Performance Indicator
kg	Kilogram
km	Kilometres
kW	Kilowatt
LA10	The noise level exceeded for 10% of the measurement time
LA90,T (or LA90)	The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS4142: 1990 it is used to define background noise level
L_{Aeq} ($L_{Aeq,1h}$; $L_{Aeq,T}$)	Equivalent continuous sound level. Another index for assessment for overall noise exposure is the equivalent continuous sound level, L_{eq} . This is a notional steady level, which would, over a given period of time, deliver the same sound energy as the actual time varying sound over the same period. Hence fluctuating levels can be described in terms of a single figure level
$L_{Ar,Tr}$	Rating level: the specific noise level plus any adjustment made for the characteristic features of the noise
L _{Amax}	Maximum value that the A-weighted averaged sound pressure level reached during a measurement period. L _{AmaxF} , or Fast, indicates that the sound pressure level is averaged in 0.125 second slices.
LAEI	London Atmospheric Emissions Inventory
LAPPC	Local Authority Pollution Prevention Controls
LAQM	Local Air Quality Management. Local authorities have statutory duties for local air quality management (LAQM) under the Environment Act 1995. They are required to carry out regular reviews and assessments of air quality in their area against standards and objectives in the national Air Quality Strategy and which have been prescribed in regulations for the purpose of LAQM. Where it is found these are unlikely to be met, authorities must designate air quality management areas (AQMAs) and prepare and implement remedial action plans to tackle the problem
LAQM.PG	Local Air Quality Management Policy Guidance
LAQM.TG	Local Air Quality Management Technical Guidance
LEZ	Low Emission Zone
LLIP	Lower Level Interchange Passageway
LOAEL	Lowest Observable Adverse Effect Level
LOS	Level of Service

Abbreviation	Definition
LPA	Local Planning Authority
L/sec	Litres per second
LSOA	Lower Super Output Area
LUL	London Underground Limited
LVMF	London View Management Framework. Provides guidance on the policies in the London Plan for the protection of strategically important views in London
L_w	Sound Power Level
Listed building	Buildings of special architectural or historic interest listed by the Secretary of State for Culture, Media and Sport on the advice of English Heritage. Buildings are graded to indicate their relative importance
Louvre	A set of horizontal slats within a wall, door, or window, sloping outwards, which allows for ventilation
London Plan 2011	Spatial development plan for Greater London – adopted July 2011
m	Metres
m^2	Metres squared
m/s	Metres per second
m^3	Metres cubed
M&E	Mechanical and Electrical
mg/l	milligrams per litre
mm	Millimetres
mms	Millimetres per second
MRF	Material Reclamation Facility
MTS	Mayor's Transport Strategy
Made Ground	Soils or other material that has been deposited by man rather than natural processes, for example to make up ground levels
Mitigation (measure)	The measures put forward to prevent, reduce and where possible, offset any adverse effects on the environment
Multiplier	Figure used to calculate the number of induced and indirect jobs created
Multiplier effects	Further economic activity (jobs, expenditure or income) associated with additional local income and local supplier purchasing
N	North
National Air Quality Strategy.	The Environment Act 1995 required the Government to develop a National Air Quality Strategy. The Strategy, originally published in 1997, set challenging health-based targets for eight main air pollutants. These are benzene; 1,3-butadiene; carbon monoxide; lead; nitrogen dioxide; ozone; fine particles (PM10); and sulphur dioxide. The predominant source for most of these pollutants is road traffic, but industrial and domestic sources are also major contributors
NB	North Bound
NGR	National Grid Reference

Abbreviation	Definition
NIA	Net Internal Area. The usable area within a building measured to the internal face of the perimeter walls at each floor level. It does not include those parts of buildings that enable them to function, i.e. corridors and circulation areas, stairways and stairwells, lavatories and toilet lobbies
NLE	Northern Line Extension
NMR	National Monuments Record
NO ₂	Nitrogen Dioxide. Road transport and the burning of fossil fuels for power are the main sources of Nitrogen dioxide. In addition to being a greenhouse gas it also contributes to photochemical smog formation. It is an irritant to the respiratory system
NO _x	Nitrogen Oxides. NO _x is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. NO _x is typically comprised largely of nitric oxide (NO) and nitrogen dioxide (NO ₂). Many of the nitrogen oxides are colourless and odourless, although NO ₂ can often be seen as a reddish-brown layer over many urban areas when present alongside particulates. NO _x form when fuel is burned at high temperatures, as in a combustion process. Consequently, these emissions occur almost exclusively from the combustion of fossil fuels for industry and transport, and from the burning of biomass
NOEL	No Observed Effect Level
NPPF	National Planning Policy Framework
NPSE	Noise Policy Statement for England
NRMM	Non-Road Mobile Machinery
NTS	Non-technical summary. A summary of the Environmental Statement in non-technical language providing a concise, yet comprehensive description of the likely effects of the project on the environment
Net	After all deductions have been made
Non-aquifer	A below ground layer of soil or rock that does not yield water
ONS	Office for National Statistics
OS	Ordnance Survey
OSD	Over Site Development
PAH	Poly Aromatic Hydrocarbon
PEDS	Pedroute Strategic
pH	A measure of the acidity or basicity of a solution
PM _{2.5}	Fine Particulate Matter with a mean aerodynamic diameter of 2.5 microns or less
PM ₁₀	Particulate Matter with a mean aerodynamic diameter of 10 microns or less
PPE	Personal Protective Equipment
PPG	Planning Policy Guidance
PPS	Planning Policy Statement

Abbreviation	Definition
PPV	Peak Particle Velocity in metres per second. The vibration measurement parameter that based on a form of acceleration that is frequency weighted to reflect human sensitivity to various frequencies
PRM	Person with Reduced Mobility
PTAL	Public Transport Accessibility Level. Method used in United Kingdom transport planning to assess the access level of geographical areas to public transport
Particulate matter	Discrete particles in ambient air, sizes ranging between nanometres (nm, billionths of a metre) to tens of micrometres (μm , millionths of a metre)
Pathways	The routes by which impacts are transmitted through air, water, soils or plants and organisms to their receptors
Permeability	The ease at which liquids (or gases) can pass through rocks or a layer of soil
Photomontage	The use of photographs of a site from a certain viewpoint to show both the current base (pre-development) state of the site and the anticipated view of the site once development is complete
Pile	A timber, steel or concrete post that is driven jacked or cast (bored) into the ground to carry vertical or horizontal loads
Plant	A building's generator, heating, ventilation, and/or electricity-production system, or the machinery used in demolition and construction
Public Realm	The space between and within buildings that are publicly accessible, including streets, squares, forecourts, parks and open spaces
RIBA	Royal Institute of British Architects
RODS	Rolling Origin and Destination Surveys
RP	Responsible Procurement
Receptor	(Sensitive) A component of the natural created or built environment such as human being, water, air, a building, or a plant that is affected by an impact
Residual Effects	Those effects from the development that cannot be mitigated following implementation of mitigation measures
Retail	The activity of selling goods to the public, usually in small quantities
Risk Assessment	An assessment of the likelihood and severity of an occurrence
Runoff	Rainwater flowing off the ground surface
S	South
SB	South Bound
SCL	Sprayed Concrete Lining
SMARTWaste	Plan that has been developed by BRE to help the industry prepare, implement and review Site Waste Management Plans
SME	Small and Medium Enterprise

Abbreviation	Definition
SO ₂	Sulphur dioxide. SO ₂ is an acidic gas that belongs to the family of sulphur oxide gases (SOX), produced during the combustion of fuels that contain sulphur compounds, such as coal and oil. SO ₂ is also released naturally from volcanic eruptions and similar natural phenomena. The health effects associated with high levels of SO ₂ are mainly concerned with breathing problems and aggregates heart and lung problems. SO ₂ , along with NOX, is one of the precursors to 'acid rain'
SOAEL	Significant Observed Adverse Effects Level
SPD	Supplementary Planning Document
SPG	Supplementary Planning Guidance. Non-statutory guidance that supplements Unitary Development Plan (UDP) policies
SPZ	Source Protection Zone
s/r	Switch Room
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SWMP	Site Waste Management Plan
Scoping	An initial stage in determining the nature and potential scale of environmental impacts arising as a result of a development, and an assessment of what further studies are required to establish their significance
Settlement	Settlement is the technical term given to the way the ground moves around a hole after it has been dug out. Digging tunnels, shafts and basements always causes small movements in the ground which may result is a change in ground level
Shaft	A vertical excavation used as a passage from the surface to the below ground works, used for ventilation, travelling, hoisting, or all three. Shafts are usually of limited cross section in relation to their depth
Sound Power	The sound power level (L _w) of a source is a measure of the total acoustic power radiated by a source. The sound pressure level varies as a function of distance from a source. However, the sound power level is an intrinsic characteristic of a source (analogous to its volume or mass), which is not affected by the environment within which the source is located
Spoil	Material removed from an excavation
Stakeholder	A person, group, or organisation that affects or can be affected by an organisation's actions
Statutory Consultee	Groups or bodies that, by law, must be consulted as part of the planning application process for EIA development
Step-plate Junction	A junction where two tunnels lined with plates of different diameters meet, and vertical plates are used to close the vertical faces, to form a step
Strata	Layer of rock or soil
Sustainable Development	Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs

Abbreviation	Definition
TA	Transport Assessment. Prepared and submitted alongside applications for developments likely to have significant transport implications. For major proposals, assessments should illustrate the following: accessibility to the site by all modes, the likely modal split of journeys to and from the site and proposed measures to improve access by public transport, walking and cycling. Statutory plans produced by each borough, which integrate strategic and local planning responsibilities through policies and proposals for the development and use of land in their area
TBM	Tunnel Boring Machine
TCA	Townscape Character Area
TfL	Transport for London
TLRN	Transport for London Road Network
TPH	Total Petrol Hydrocarbons
tph	Trains Per Hour
TWAO	Transport and Works Act Order. Can authorise railways, tramways, guided transport schemes and certain other types of infrastructure project in England and Wales
TWUL	Thames Water Utilities Limited
TVIA	Townscape and Visual Impact Assessment
Tender	A bid for a contract
Threshold	A level of effect above which an assessment will be taken of whether any changes to procedures need to be made
Triplification area	Existing three pedestrian cross passages between existing Northern Line tunnel and existing Northern Line and Central Line link.
UDP	Unitary Development Plan. A land use plan. It provides the statutory planning framework for the local planning authority setting out the objectives, policies and proposals for the use of land and buildings in the area for the next 10 years
UK	United Kingdom
URS	URS Infrastructure and Environment UK Limited. Authors of the Environmental Statement
UXO	Unexploded Ordnance
VDV	Vibration dose values in metres per second. The vibration measurement parameter that based on a form of acceleration that is frequency weighted to reflect human sensitivity to various frequencies
VVM	Visually Verified Montage
W	West
WAC	Waste Acceptance Criteria
WRAP	Waste Resources Action Programme
WFD	Water Framework Directive

Abbreviation	Definition
Whole Block Site	Site bounded by King William Street, Nicholas Lane, Cannon Street and Abchurch Lane (The term Cannon Street Site is used within the consultation and some other application documents)
μm	Micrometer: a unit of length equivalent to one thousandth of a millimetre
$\mu\text{g}/\text{m}^3$	Microgram per cubic metre. A measure of concentration commonly used to present air quality conditions
ZVI	Zone of Visual Influence