Green Estate Management Plan for the Transport for London Road Network

Final

June 2013

Contents

This document is published in June 2013 for internal use within TfL. The coverage is limited to the management of assets in the control of Roads Directorate.

It incorporates the landscape management plan, the tree strategy and the biodiversity action plan for the TfL road network (TLRN), with the exception of the A13 which is managed under a design, build, finance and operate (DBFO) contract.

This document will have annual updates to reflect internal and external changes with suggested changes and amendments collated by the Arboriculture and Landscape Route Managers and the Environmental Manager. The whole document will be reviewed once every three years.

Ownership of this document – Dana Skelley, Director of Roads

Primary implementation – Andy Best, Head of Highways

Implementation support and key contacts:

- Arboriculture and Landscape Route Managers:
  - Howard Booth, South;
  - Phil Hurst, North; and
  - John Parker, Central.
- Surface Transport Environment Team (STET)
  - Nicola Cheetham, Head of Environment (Surface Transport); and
  - Giovanni Nacci, Environmental Manager.

Issue	Date	Author	Checker	Approver
1.1	June 2013	Howard Booth	Nicola Cheetham and Andy Best	Dana Skelley

Acronym	Full name/ details/ link
CAVAT	Capital Asset Valuation for Amenity Trees
DBFO	Design, Build, Maintain & Operate
DfT	Department for Transport
GEMP	Green Estate Management Plan
GiGL	Greenspace Information for Greater London
GLA	Greater London Authority
HMWC	Highways Maintenance & Works Contracts
LoHAC	London Highways Alliance Contract
LTOA	London Tree Officers Association
MTS	Mayor's Transport Strategy
NAMS	Network Asset Management System
NJUG	National Joint Utilities Group
SQA	Surface Transport Quality Assurance
STET	Surface Transport Environment Team
TfL	Transport for London
TLRN	Transport for London Road Network

1 Green Estate Management Plan – Background

1.1 Purpose and structure

1.1.1 The purpose of the GEMP is to:

- provide the overall structure and framework for the management of the TLRN green estate;
- define and quantify the green estate as an asset of the TLRN;
- summarise key legislation for TfL as a public authority and the highway authority for the TLRN in the protection and care of biodiversity, trees and the wider landscape of the TLRN;
- help deliver key parts of environmental policies in Mayoral strategies and TfL's environmental objectives;
- describe how TfL will fulfil its duties as a manager of the green estate in the highway;
- set in place mechanisms for the delivery of the GEMP which build on existing procedures for the management of the green estate; and
- achieve greater consistency in survey, recording, funding, resourcing and management across the TLRN, taking account of land uses outside the highway boundary.

1.1.2 The 2008 GEMP had four separate sections to cover an introduction, a landscape management plan, a tree strategy and a biodiversity action plan. These separate aspects are interlinked and have now been combined to avoid duplication. This GEMP draws on existing procedures and working practice and suggests, where appropriate, improvements to these systems or the adoption of new processes.

1.2 The TLRN green estate

1.2.1 The TLRN is made up of 580 kilometres of road network, comprising the principal roads, or Red Routes, through the Capital. TfL is the highway authority for the TLRN with responsibility for the operation and management of the network. Whilst only representing around 5% of London's roads, the TLRN carries an estimated 33% of the Capital's traffic[1].

1.2.2 The TLRN green estate comprises trees, hedges, grassed verges, woodland and planted areas. Although embankments and cuttings are classed as structures, any vegetation upon them forms part of the green estate. Table 1 summarises the extent of the green estate recorded in the NAMS database. This excludes the A13 DBFO contract (Butcher Row to Wennington and A1203 from Butcher Row to Canning Town).

[1] http://www.london.gov.uk/mayor/transport/streets.jsp

Table 1: Green estate asset types, definitions and quantities[2]

Asset type	Definition	Quantity
Hedge	A continuous row of closely planted trees and/or shrub species maintained as a linear feature through regular pruning.	45,963 m
Planted area	An area of vegetation which is typically shrub or herbaceous plants and includes shrub beds, raised beds, seasonal bedding and scrub.	542,424 m²
Tree (individual)	A perennial plant with a single woody, self-supported trunk and branches.	23,163
Grass	An area of vegetation which tends to be dominated by grass species.	2,014,516 m²
Woodland	An area of tree and shrub species generally maintained for screening and biodiversity value.	816,720 m²

1.2.3 The green estate represents a significant ecological resource which is vital to the maintenance and enhancement of the biodiversity of the Capital. In outer London, many routes provide linear habitats combining grassland, scrub, woodland, ditches and water bodies which cut through the surrounding townscape. In inner areas, street trees and other planting can provide valuable refuges for a range of invertebrates, birds and mammals.

1.2.4 Wildlife will adapt to a changing environment and many species occur in the most unlikely places. Waste ground and scrub can provide valuable habitat for reptiles and hibernaculum for amphibians, whilst bats can roost in a wide range of structures and trees. Records of the presence of protected species on the TLRN are not comprehensive. Table 2 lists protected species of fauna considered most likely to be present on the TLRN.

1.2.5 As highway authority, TfL is required to comply with legislation in respect of the protection and management of habitats on the TLRN and adjoining land. Many routes on the TLRN run in close proximity to protected habitats. For instance, the A13 cuts through the Thames Marshes, a reserve of national and international importance designated as a RAMSAR site, a Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA).

1.2.6 There are also many examples of Local Nature Reserves (LNRs) and Sites of Interest for Nature Conservation (SINC), located close to the TLRN. The 2004 Habitat Survey identified designated nature conservation sites within 500 metres of the TLRN and this data is held by GiGL.

[2] Quantities taken from NAMS June 2013

Table 2: Possible Protected Species of Fauna and Potential Habitats on the TLRN

Protected Species	Typical Habitat
Nesting Birds	Trees, shrubs, hedges, long grass and highway structures
Bats	Trees, standing dead timber and highway structures
Common species of reptiles and amphibians	Scrub, areas of open grassland and waterbodies, hardcore spoil
Badgers	Wide undisturbed verges, embankments and cutting slopes
Water voles	Roadside ditches and other waterbodies
Invertebrates	Deadwood and verges

1.3 Duties and powers of TfL as a highway authority

1.3.1 As the highway authority for the TLRN, TfL has a duty to operate and maintain the highway network in accordance with the requirements set out in the Highways Act 1980.

Maintenance of the highway

- Section 41(1) places the duty on highway authorities to "maintain the highway" which includes the green estate.
- Section 130(1) states that highway authorities have a statutory duty to "assert and protect the rights of the public to the use and enjoyment of any highway for which they are the highway authority".

Planting in or near the highway

- Section 96 empowers the highway authority to "plant trees and shrubs and lay out grass verges" provided these do not "hinder the reasonable use of the highway".
- Section 142 enables the highway authority to grant licences to occupiers or owners of adjacent premises to plant trees, shrubs or grass on highway land.

Power to control off-site vegetation

- Section 154[3] gives highway authorities the power to require owners to cut or remove vegetation that overhangs or is a danger to roads or footpaths.

[3] Modified by London Local Authorities and Transport for London Act 2008

1.4 Duties of TfL as a manager of the green estate

1.4.1 TfL recognises that there are statutory duties and a duty of care associated with the management of the green estate on the TLRN. National and international legislation sets out a framework for many aspects of the management of the green estate.

1.4.2 The UK is a signatory of the International Convention on Biological Diversity, which was agreed at the UN Conference on Environment and Development in Rio de Janeiro in June 1992. The Rio Convention committed signatories to take action to conserve and enhance biodiversity within their national boundaries. The UK Government has taken this commitment forward through the publication of 'Biodiversity: the UK Action Plan' in 1994 and subsequently 'Biodiversity: the UK Biodiversity Steering Group Report' in 1995. This latter report is referred to as the UK Biodiversity Action Plan and describes action plans for 116 species and 14 habitats. Subsequent reports have increased numbers to over 400 Species Action Plans and 45 Habitat Action Plans.

1.4.3 Several pieces of legislation other than the Highways Act directly applies to the green estate on the TLRN, these are summarised in Appendix 1.

1.5 Mayoral and TfL plans and strategies

Mayor's Transport Strategy, May 2010

1.5.1 The MTS sets out the transport vision for London and details how TfL and partners will deliver the strategy over the next 20 years. One of the key objectives of the MTS is to enhance transport's contribution to the natural environment. Proposal 90 replicates Proposal 35 of the Mayor's Biodiversity Strategy by stressing that: The Mayor, through TfL, and working with the DfT, Highways Agency, London boroughs, Network Rail, and other stakeholders, will make the most of open spaces across the transport system (for example, green spaces alongside railway lines, roads, rivers, canals, cycling and walking routes, green grids and on roof tops) to improve the quality and diversity of London's natural environment.

1.5.2 TfL has a duty to use its powers to facilitate and implement the MTS. The vision of the MTS:

London's transport system should excel among those of world cities, providing access to opportunities for all its people and enterprises, achieving the highest environmental standards and leading the world in its approach to tackling urban transport challenges of the 21st century.[4]

1.5.3 The MTS sets challenges and outcomes which, with regard to the green estate, include:

- Delivering an efficient and effective transport system for people and goods:
    - bringing and maintaining all assets to a state of good repair

[4] The Mayor's Transport Strategy (Mayor of London, May 2010)

- Improving journey experience:
  - improving public transport customer satisfaction
  - improving road user satisfaction (drivers, pedestrians, cyclists)
- Enhancing the built and natural environment:
  - enhancing streetscapes, improving the perception of the urban realm and developing 'better streets' initiatives
  - protecting and enhancing the natural environment
- Improving noise impacts:
  - improving perceptions and reducing impacts of noise
- Reducing crime, fear of crime and antisocial behaviour:
  - reducing crime rates (improving perceptions of personal safety and security)
- Improving road safety:
  - reducing the numbers of road traffic casualties
- Adapting for climate change:
  - maintaining the reliability of transport networks

1.5.4 Proposal 113 of the MTS promotes the planting of an additional 10,000 street trees by 2012, with the ambition of an additional two million trees in London's parks, gardens and green spaces by 2025.

The London Plan[5], July 2011

1.5.5 The London Plan is the overall strategic plan for London, and it sets out a fully integrated economic, environmental, transport and social framework for the development of the Capital to 2031.

1.5.6 The London Plan contains six objectives for London, three of these are directly relevant to trees and woodland:

- **A city of diverse, strong, secure and accessible neighbourhoods** - a high quality environment for everyone to enjoy must include trees and woodland.
- **A city that delights the senses** – making the most of and extending its wealth of open and green spaces and waterways, realising its potential for improving Londoners' health, welfare and development – the delivery of trees and woodland will help to achieve this.
- **A city that becomes a world leader in improving the environment** – is concerned with tackling climate change – the provision of trees and woodland as part of urban greening is fundamental to addressing this objective.

1.5.7 Policy 7.19 seeks to establish collaborative working with all relevant London partners to ensure a proactive approach to the protection, enhancement,

[5] http://www.london.gov.uk/sites/default/files/tree-woodland-strategy.pdf

creation, promotion and management of biodiversity in London. This means planning for nature from the beginning of the development process and taking opportunities for positive gains for nature through the layout, design and materials of development proposals and appropriate biodiversity action plans.

1.5.8 Policy 7.21 of the London Plan promotes the protection of existing trees, the planting of additional trees and the protection and creation of woodland and makes an explicit reference to the production of Supplementary Planning Guidance to help implement this policy.

Connecting with London's nature – The Mayor's Biodiversity Strategy, July 2002[6].

1.5.9 TfL has a duty to comply with and deliver policies and proposals set out in the Mayor's Biodiversity Strategy. The foreword sets out two overall targets against which the success of the strategy is to be measured. These are:

- that there is no overall loss of wildlife habitats in London; and
- that more open spaces are created and made accessible.

1.5.10 The Strategy identifies 14 Policies and 72 Proposals for the delivery of these policies. TfL is named as Lead Organisation in two Proposals:

- Proposal 17: The Mayor will request that his Functional Bodies undertake biodiversity surveys on their holdings of open land, and, where appropriate, manage them to conserve and enhance biodiversity; and
- Proposal 35: The Mayor will work with TfL and will encourage the Highways Agency, Railtrack, the London borough councils and other transport bodies to ensure that the potential for wildlife habitat on the verges of roads, footpaths, cycleways and railways is realised wherever possible.

Business Plan – Transport for London's plans for the next decade, December 2012

1.5.11 Within the Business Plan TfL aims to plant more than 100 trees on its roads every year. Along with other measures including green infrastructure such as green walls and roofs this will help improve air quality, soak up rain run-off and regulate summer temperatures by absorbing reflected heat from buildings.

Connecting Londoners with Trees and Woodlands – A Tree and Woodland Framework for London, March 2005

1.5.12 The framework sets out issues to tree and woodland management in London and it provides suggested indicators to measure the protection and quality of existing trees and woodlands. Case studies are provided to demonstrate improvements to tree and woodland management with social, environmental and economic benefits. The 'right place – right tree' principle is promoted to ensure that only correct locations are considered for tree planting, followed by the correct type of tree.

[6] 'Connecting with London's nature – The Mayor's Biodiversity Strategy' (July 2002)

Preparing Borough Tree and Woodland Strategies, July 2012

1.5.13 As a document to support the delivery of the London Plan, this supplementary planning guidance sets out the process and principles a local authority should apply when preparing a tree and woodland strategy.

1.6 Other documents

1.6.1 Other documents that have influenced this GEMP include:

Chainsaw massacre – A review of London's street trees[7], May 2007

1.6.2 The London Assembly investigated street management and found that across London there has been a net increase in street tree numbers in the preceding five years. They also found that 5% of trees that were removed were felled due to subsidence claims and that health and safety reasons, often following storm damage, accounted for the majority of tree removals in the Capital.

1.6.3 The report indicated that almost all inner London boroughs showed a net increase in street trees over the previous five years. Across London there was great variation in the standards of street tree management and tree losses have been greatest in the outer London boroughs, where it might be assumed that pressures for removal are less intense.

1.6.4 Recommendation 9 of the report was for TfL "*to conform to best practice on tree planting and maintenance in line with local authority practices into its Highway Asset Management Plan*".

Trees in Towns II – A new survey of urban trees in England and their condition and management, 2008

1.6.5 A department for Communities and Local Government publication which reviewed how trees are managed. It sets out ten relatively simple tree management targets for local authorities such as having computerised tree management database and having at least one tree officer, preferably qualified in arboriculture at Higher education level.

1.6.6 The study found in London that canopy cover was 8.2% (same as the national average) and in London 14% of the canopy cover was from street and roadside trees.

Branching Out – The future of London's street trees, April 2011

1.6.7 The London Assembly's follow up investigation after Chainsaw Massacre found that Londoners still value trees and that the Mayor needed to support several measures to help retain trees and these included tree valuation, supporting continued investment, a recognised claims handling process, publicly available data and limiting severe pollarding and pruning techniques to only exceptional circumstances. These measures would help to ensure a canopy cover for a changing climate in London.

[7] 'Chainsaw massacre: A review of London's street trees (London Assembly, May 2007)

1.6.8 Among London boroughs the budget varied from £55 to £1 spent per tree per year (average £21.43). The use of Capital Asset Valuation for Amenity Trees was supported as a tool to value trees and help secure resources.

Trees in the Townscape – A guide for decision makers, 2012

1.6.9 Trees and Design Action Group has published several documents about incorporating trees, one of the latest is *Tree in the townscape* which sets out 12 principles of best practice.

1.7 Benefits provided by the green estate

1.7.1 Benefits from the green estate, especially trees, are widely reported[8] and can be broadly summarised as:

- **Climate Change**: The benefits of vegetation, in particular trees, with regard to climate change adaptation is widely reported and includes the reduction in extremes in temperature by providing shade in summer and reducing heat loss in winter, filtering some air pollutants and improving air quality, reducing storm water run-off, source of oxygen and as a carbon sink, are also now widely recognised[9];
- **Biodiversity**: The green estate encompasses a wide range of habitats across London and can act as a source of food and a corridor for the movement of fauna;
- **Public Amenity**: Street trees and other planting associated with TLRN contribute to the wellbeing, experience and amenity of Londoners and visitors to the Capital. Planting associated with the TLRN will often serve a specific function such as screening or integrating the highway or parts of it. The green estate can increase property values, especially on tree-lined roads[10]; and
- **Landscape and Heritage**: The highway streetscape reflects the heritage and changing character of London. Mature trees which are a feature of many of the Capital's streets may be several hundred years old. These older trees along with newer trees can set or define a highway, especially with the use of avenue planting to give character to an area or section of road.

1.7.2 In addition to the many benefits of the green estate it can also present a nuisance or cause problems; these include:

- **Physical**: direct physical impacts include leaf and fruit fall; grass cutting; shading; thorns; honeydew; bird droppings; pollen; disruption of TV reception; damage to overhead cables; direct and indirect damage (subsidence) to structures; partial or complete tree failure; obscured visibility splays and signs; and obstruction of the highway; and

[8] 'Tree and Woodland Strategies SPG' (Mayor of London, 2012) and 'Common Sense Risk Management of Trees' (National Tree Safety Group, 2011)

[9] 'Connecting Londoners with Trees and Woodlands; A Tree and Woodland Framework for London' (Mayor of London March 2005)

[10] See 'Sustaining Success: The Mayor's Economic Development Strategy' (LDA and partners 2004)

- **Social and economic**: wider problems associated with the maintenance of the green estate include disruption to traffic; cost to maintain; and stress caused to residents with a fear of falling trees.

1.8 Management of the green estate

Management structure

1.8.1 The management of the TLRN green estate is undertaken by the Roads Directorate. Maintenance is carried out by the LoHAC contractor reporting to the Highways Team within the Roads Directorate.

1.8.2 The Highways Team includes Arboriculture and Landscape Route Managers with direct responsibility for the maintenance of the green estate. The LoHACs have specialist Landscape Managers who programme and implement the work to maintain the green estate.

1.8.3 Unlike most other assets there is no dedicated client for the green estate. In lieu of a client, the Arboriculture and Landscape Route Managers, together with the Head of Environment (Surface Transport), decide the processes and procedures to ensure that business needs are met with consistency in approach across the different areas.

1.8.4 Within Roads Directorate, the Asset Investment Team works with the Highways Team to determine future budget requirements.

Safety inspections

1.8.5 Safety inspections identify all defects likely to create danger or serious inconvenience to road users or the wider community. Defects identified are categorised as either *Category 1* or *Category 2*, each having a defined response time for repairs. Safety inspections are carried out at frequencies shown in Table 3.

Table 3: Safety Inspection Frequencies

Assets to be Inspected	Road Hierarchy	Frequency of Day Time Safety Inspection
TfL Highway Assets	Rural Fringe Roads	1 week
	Suburban Roads	1 month
	Urban Roads	1 month

1.8.6 Highway inspectors report obvious defects such as trees experiencing sudden leaf loss in the growing season, pest infestation, vehicle strikes or vandalism. Arboricultural inspections are then undertaken to determine actions required to mitigate any safety risks.

Operational Maintenance

1.8.7 If operational maintenance does not deliver timely and effective maintenance, it can lead to more rapid deterioration of the green estate and renewal (replacement) of an asset or assets may be required prematurely. The management of the green estate seeks to ensure the correct level of operational maintenance to avoid the need for premature renewal.

1.8.8 All asset renewal is undertaken within operational maintenance budgets with the exception of tree planting.

1.8.9 Operational maintenance includes activities that are planned and undertaken on a regular basis and those that are undertaken as and when the need arises. Table 4 summarises the main areas of maintenance work and the frequency at which they are typically undertaken; this varies based on the location type. Table 4 also notes whether the work is undertaken as a lump sum work activity by the LoHAC contractor or whether it is instructed by TfL.

Table 4: Typical maintenance regimes

Location	Urban Centre or Special Area	Urban / Suburban Residential	Suburban / Rural fringe / Clearway	Instructed or contract lump sum
Examples	Hanger Lane, Park Lane, and Morden, Croydon, Bromley and Sutton Town Centres	A10 Great Cambridge Road, most of A23, A24, A217, A297 and A205	A127 outer, A102 – A12, A2 Bexley, A21 Farnborough Common and Farnborough Way	
	Treatments	Treatments	Treatments	
Planted areas				
Established shrub bed - weed control	8 p/a	4 p/a	4 p/a	Lump sum
Established shrub bed - pruning	1-4 p/a	1-4 p/a	1-4 p/a	Lump sum
Bedding - planting	4 p/a	2 p/a	n/a	Instructed
Bedding - maintenance	13 p/a	13 p/a	n/a	Instructed
Special features eg tubs, planters, hanging baskets	26 p/a	26 p/a	n/a	Instructed
Grass				
High frequency	16 cuts, 4 edging and 2 reforms p/a	16 cuts, 4 edging and 2 reforms p/a	n/a	Lump sum
Medium frequency	11 cuts, 2 edging and 1 reform p/a	11 cuts, 2 edging and 1 reform p/a	11 cuts, 2 edging and 1 reform p/a	Lump sum
Low frequency	n/a	6 cuts pa	6 cuts pa	Lump sum
Wildflower	1 cut p/a	1 cut p/a	1 cut p/a	Lump sum
Trees				
Defect survey	annual	annual	annual	Lump sum
Condition survey (every 5th year)	0.2 p/a	0.2 p/a	0.2 p/a	Lump sum

Climbing survey & decay mapping	reactive	reactive	reactive	Instructed
Removal of epicormic (basal) growth	1 or2 p/a	1 or 2 p/a	1 or 2 p/a	Lump sum
Adhoc safety tree pruning	Reactive	Reactive	Reactive	Instructed
Hedges				
Hedges – general	1 p/a	1 p/a	1 p/a	Lump sum
Hedges – fast-growing species	2 p/a	2 p/a	2 p/a	Lump sum
Weed control	2 p/a	2 p/a	2 p/a	Lump sum
Woodland areas				
Woodland and scrub - edge cut	n/a	1 p/a	1 p/a	Instructed
Woodland management (every 10 years)	0.1 p/a	0.1 p/a	0.1 p/a	Instructed
Injurious weeds				
Weed control	Reactive	Reactive	Reactive	Lump sum

Capital Maintenance

1.8.10 For accounting purposes, tree planting is the only area of capital maintenance expenditure.

1.8.11 Currently, there is no defined methodology for the prioritisation of tree planting. Arboriculture and Landscape Route Managers are responsible for preparing planting schedules based on their local knowledge and any requests from the local community; there is currently no internal review process for this.

Planned Improvements

1.8.12 In addition to the capital and operational maintenance programmes, the programme of TLRN improvement schemes may include green estate enhancement, such as new tree planting.

1.8.13 Improvement schemes are identified to address specific issues, such as the provision of cycle superhighways and the realignment of junctions to improve safety. As a consequence, any green estate enhancement work undertaken as part of planned improvements does not necessarily target assets in poor condition or parts of the TLRN lacking green infrastructure (vegetation).

1.8.14 It is the role of TfL, following Mayoral and TfL's objectives for the natural environment, to ensure that these interventions protect and enhance the green estate. Arboriculture and Landscape Route Managers ensure that proposed environmental improvements are fit for purpose and do not present TfL with a maintenance liability.

1.9 The NAMS database

1.9.1 NAMS is the database used by TfL to record the type, location and condition of assets on the TLRN, including assets forming part of the green estate. It records the location of assets, although the condition data is currently incomplete for most of the green estate assets. The continued development of the NAMS database is essential to the delivery of many elements of the GEMP and is included in the relevant policies.

Trees

1.9.2 Trees have the most detailed qualitative and quantitative data records for the green estate; this was originally designed around the need to record tree inspections and associated tree defects.

1.9.3 Trees are recorded as point data in NAMS. The dataset in NAMS includes many off-site trees which were wrongly plotted by contractors under the belief that they belonged to TfL but were actually on borough side roads next to traffic authority redlines. Other off-site trees include those which are potentially dangerous by nature of their location, age or condition and may require a Section 154 notice (see 1.3).

1.9.4 Trees within woodlands are generally not recorded as individual trees but those which require specific management are recorded to aid relocation and ensure their defects have been recorded. Woodland trees are typically not replaced as part of woodland management so the tree dataset differentiates between trees in woodlands and street trees to ensure that reporting can be accurate.

1.9.5 Tree data is updated annually to record that trees have been inspected and there is a full inventory review and update once every five years.

Woodlands

1.9.6 Woodlands are plotted in NAMS as polygons and the main function of this dataset is to record when the trees were inspected for safety. The woodland dataset includes woodlands as well as groups of trees which cannot be recorded practicably as separate trees and are therefore managed as a group.

1.9.7 Woodland data is updated annually to record that trees have been inspected and there is a full inventory review and update once every five years.

Planted areas

1.9.8 Planted areas are plotted in NAMS as polygons. Historically, the dataset recorded the presence of planted areas to differentiate from grassed areas. To prepare for LoHAC, management regimes for bedding, high amenity shrub, general amenity shrub, scrub and woodland were created to classify each planted area. There is currently no condition attribute for planted areas.

1.9.9 Planted area data is only updated following maintenance or improvement work being undertaken.

Hedges

1.9.10 Hedges are plotted in NAMS as lines. The dataset records the species of the hedge along with the height to which it should be maintained and whether one or both sides should be trimmed. When the data was collected in 2011, an assessment of potential for nesting birds was recorded along with a record of the asset condition (poor, fair or good).

1.9.11 Hedge data is only updated following maintenance work or improvement work being undertaken.

Grass areas

1.9.12 Areas of grass are plotted in NAMS as polygons and are recorded in the verge, central reservation, and central island datasets. The grass data is held in the same dataset as hardstanding verges. There is a record for when the grass was last cut but there is no record of condition.

1.9.13 Grass data is only updated following maintenance work or improvement work being undertaken.

Injurious weeds

1.9.14 In 2004, a biodiversity survey of the outer TLRN recorded the presence of injurious weeds. This data has been held with all other biodiversity data as viewable data in NAMS, recorded as a polygon. The injurious weed data has been kept in NAMS to ensure that the weeds are controlled.

1.9.15 Injurious weed data is only updated following a re-survey or improvement work.

2 Policies

2.1 Policy 1 – Sustainable landscape management

TfL will manage and maintain the TLRN green estate in a cost-effective and sustainable manner and ensure a consistent approach is taken to management and maintenance.

2.1.1 The Arboriculture and Landscape Route Managers work with the LoHAC Landscape Managers to ensure all maintenance operations on the green estate are carried out in a cost-effective and sustainable manner through the use of TfL and LoHAC management systems.

2.1.2 The Arboriculture and Landscape Route Managers and LoHAC Landscape Managers will meet regularly in order to review management and maintenance issues relating to the green estate.

2.1.3 Led by the Surface Transport Environment Team, Environmental Fora will be held on a regular basis for TfL and Contractors to exchange information and share examples of best practice. Arboriculture and Landscape Route Managers and LoHAC Landscape Managers will be invited to attend when management of the green estate is on the agenda.

2.1.4 By requiring LoHACs to have *National Highway Sector Schemes*[11], including sector scheme 18 (the natural environment and landscape including ecology) TfL ensures there is a skilled and competent workforce on the green estate focussing on quality as an objective.

2.1.5 Wherever practical and cost-effective, the Arboriculture and Landscape Route Managers and LoHAC Landscape Managers will seek to ensure consistency across contract areas in the timing and type of maintenance operations across administrative boundaries.

2.1.6 Surface Transport's environmental evaluation procedure will alert the Arboriculture and Landscape Route Managers to proposed works which may affect the green estate. Working with the Surface Transport Environment Team, the Arboriculture and Landscape Route Managers will seek to minimise any negative impacts, requiring any appropriate mitigation, and will seek to maximise any environmental benefits from the proposed works.

2.1.7 The Arboriculture and Landscape Route Managers will review all planned improvement schemes on the TLRN, as described in 1.13.3. Developments on adjacent land with the potential to impact on the TLRN green estate will also be reviewed by Arboriculture and Landscape Route Managers to minimise the detrimental impact on TfL's green estate, taking account of the potential conflicts from future growth of proposed third party planting.

2.1.8 TfL's highway maintenance contracts include a standard single common specification for the maintenance of green estate assets including hedges, shrub beds and areas of grass. The introduction to the GEMP in Table 4 includes a schedule which sets out maintenance regimes for green estate assets.

[11] London Highways Alliance Contracts, Specification for Highway Works clause 104.

2.1.9 The Arboriculture and Landscape Route Managers and LoHAC contractors will work with other service providers working on the TLRN to ensure compliance with current industry standards and best practice guidance in respect of works with the potential to impact on the green estate.

2.1.10 TfL Commercial Development is responsible for the promotion of sponsorship sites on the TLRN and will manage the contracts with third parties. Arboriculture and Landscape Route Managers will advise TfL Commercial Development whether sponsorship is appropriate, taking account of the impact any proposals, including the location of any signs, on green estate assets, the safety of maintenance activities and the need for any reinstatement of the green estate.

2.2 Policy 2 – Asset inventory

Roads Directorate will develop and manage an accurate inventory of all assets forming part of the TLRN green estate in the NAMS database.

2.2.1 TfL will maintain asset data as part of the NAMS database which describes the green estate asset type and condition on the TLRN. This will include the extent, condition, function, and any pertinent characteristics such as local importance.

2.2.2 TfL will continue to refine the NAMS database to ensure that asset data relating to the green estate is clearly identifiable and accurately recorded.

2.2.3 The condition of all green estate assets will be recorded by the LoHAC and the data held in NAMS. The condition data will be used, along with local knowledge and comments from stakeholders, to inform priorities for renewal of green estate assets or planned improvement works. This information will be used to prioritise work in each management area and can also be used to inform the allocation of funding between management areas to ensure TfL is allocating funds in a fair and consistent manner.

2.2.4 The LoHACs, supported by the Arboriculture and Landscape Route Managers and the NAMS database team will be responsible for updating and the management of asset data for the TLRN green estate.

2.2.5 The LoHACs will carry out Service and Safety Inspections in accordance with the frequencies specified in the contract specification. Other specialist surveys will be commissioned by TfL and undertaken in accordance with the frequencies and scope described in other parts of the GEMP.

2.2.6 The LoHACS will maintain records of surveys, service and safety inspections relating to the green estate and will update the information held on the NAMS database.

2.2.7 The TfL NAMS database team will assist the Arboriculture and Landscape Route Managers to analyse green estate data held in NAMS.

Trees

2.2.8 In NAMS, trees are classified as being either a Street or Woodland tree. This differentiation is used to ensure that enquiries about tree numbers can be answered accurately as most of the enquiries concern street trees.

2.2.9 The LoHAC contractors are responsible for maintaining records of works carried out to trees in NAMS.

2.2.10 In addition to the periodic safety inspections carried out by the highway inspectors which capture obvious tree defects, the LoHAC contractors carry out two types of tree survey using qualified arboriculturists.

2.2.11 The Tree Defects survey, which is carried out on an annualised basis for each tree and woodland area, is primarily designed to establish which trees exhibit defects ('defects trees') that may lead to the tree or trees causing harm or damage to the TLRN and its users. The survey brief requires any defect tree to be recorded on NAMS. The survey brief includes the requirement for the LoHAC to raise work orders for remedial works in NAMS and to record the risk level to ensure that work is undertaken in a priority sequence.

2.2.12 The Tree Condition survey is carried out once every five years for each tree and woodland area. The five year survey is a full inventory update, recording the condition, value and size of all trees regardless of whether the tree is recorded as a 'defect tree'.

Biodiversity

2.2.13 In 2004, TfL commissioned a biodiversity survey of the outer parts of the TLRN. The survey methodology was based on that recommended by the GLA who recommended that surveys are undertaken every ten years. It was intended the data gathered would be used to inform work on the TLRN so that locations with biodiversity interest or potential interest could be protected and managed appropriately.

2.2.14 Table 5 provides a summary of Primary Habitats identified as part of the 2004 survey for land within the TLRN highway boundary (this did not include central London and used different survey rules to the current NAMS).

2.2.15 The survey confirmed that land on and adjacent to the TLRN represents a significant ecological resource which is important to the maintenance and enhancement of the biodiversity of the Capital. In outer London, many TLRN routes provide linear habitats combining grassland, scrub, woodland, ditches and waterbodies which cut through the surrounding townscape. In inner areas, street trees and other planting can provide valuable refuges for a range of invertebrates, birds and mammals. There are also many species of plants and animals which have successfully adapted to the urban environment by colonising structures and buildings.

2.2.16 The TLRN is a busy road network and the use, management and operation of the network has the potential to impact upon biodiversity, not just on the TLRN, but also in adjoining areas. Traffic emissions, noise, light pollution, water run-off contaminated by vehicle fuel, chemicals and road salts and the need to remove or manage vegetation in order to allow safe use of the network all have the potential to impact on biodiversity.

Table 5: Primary Habitats on the outer TLRN[12]

Primary Habitat	Measure
Grassland	1,326,000 m^2
Scrub and planted areas	500,000 m^2
Woodland	382,000 m^2
Hedgerow	24,232 m
Wasteland	88,000 m^2
Ponds and lakes (within 500 m of TLRN)	1200 m^2
Wetland	2000 m^2
Other (farmland, gardens, etc)	7000 m^2

Action	Before September 2013 Arboriculture and Landscape Route Managers will confirm the schedule of all data that is required to be held in NAMS to enable the implementation of this plan.
Action	Arboriculture and Landscape Route Managers will ensure that any gaps, errors and omissions in NAMS data are rectified by LoHAC after surveys and updates to NAMS.
Action	Arboriculture and Landscape Route Managers will undertake a minimum 5% sample shadow survey to check accuracy and reliability of the data.
Action	Arboriculture and Landscape Route Managers will develop a programme of site surveys for the TLRN Priority Habitat Sites to better understand the habitat resources at these sites and inform biodiversity protection and enhancement interventions. The findings of site surveys will be shared with GiGL.
Action	Arboriculture and Landscape Route Managers with Environment Team will identify priority habitat sites on or adjacent to the TLRN by mapping the TLRN against GiGL priority habitats. These sites will be known as TLRN Priority Habitat Sites.

2.3 Policy 3 – Landscape Management Plans

Landscape Management Plans will be prepared for the Green Estate based on geographic corridors of the TLRN.

[12] Source 2004 Habitat Survey – Data queried on 5th August 2008

2.3.1 The Landscape Management Plans will be prepared by the Arboriculture and Landscape Route Managers and will set out the future management strategy for the road, taking account of existing site factors and standards of maintenance. The Landscape Management Plans will also set out the main function of the green estate assets and recommendations for the management of each asset type.

2.3.2 The Landscape Management Plans will consider the need for succession planting in locations where inappropriate species exist and are best replaced through a phased process and will list the appropriate species for planting in the future to ensure long term consistency, taking account of the need for resilience against pests and diseases.

2.3.3 The Landscape Management Plans shall record a summary of the key constraints and issues that have been encountered in the management and maintenance of the green estate including constraints to planting.

2.3.4 Opportunities for improvement and enhancement of the green estate on the TLRN shall be recorded in the Landscape Management Plans and these should be reviewed on an annual basis to inform a programme for improvement works.

2.3.5 TfL will work with the LoHAC contractors to eradicate injurious weeds on TLRN. TfL will also work with neighbouring landowners and authorities to eradicate injurious weeds on land adjoining the TLRN where a joined up approach is needed.

2.3.6 Landscape Management Plans shall take account of key strategic or environmentally sensitive sections of the TLRN where it passes through or adjacent to the following:

- Areas of National or International Importance for Nature Conservation. This shall include:
    - Sites of Special Scientific Interest (SSSI);
    - Special Protection Areas (SPA);
    - National Nature Reserves (NNR);
    - Special Areas of Conservation (SAC); and
    - RAMSAR Sites;
- Areas of Metropolitan Importance, Borough and Local Interest for Nature Conservation;
- Landscapes of national importance for scenic beauty, principally Areas of Outstanding Natural Beauty (AONB);
- Extensive areas of Metropolitan Open Land or Green Belt;
- Historic Landscapes, Parks and Gardens listed on the English Heritage Historic Parks and Gardens Register;
- Conservation Areas and routes with trees protected by Tree Preservation Orders; and

- Sites identified of particular habitat importance in the 2004 biodiversity survey, GiGL data and any other ecology surveys.

2.3.7 The Landscape Management Plans will follow a set template to ensure consistency and will comprise the following:

- Brief description of the geographical context of the route to include national and local environmental designations;
- Summary of the overall character of the route described by zones principally urban, suburban and rural fringe;
- Description of landscape plots with reference to:
  - Landscape typology
  - Environmental function
  - Age and condition
  - Past management
  - Injurious weeds
  - Biodiversity interest
  - Other issues eg fly tipping;
- Definition of Management Objectives for each Route/Area Character Zone;
- Five Year Works Programme; and
- Mapping based on NAMS Data.

2.3.8 All Landscape Management Plans will be peer reviewed and approved by the Head of Environment with investment considerations assessed by the Director's Office.

Action	Before September 2013 Arboriculture and Landscape Route Managers will confirm the format for the Landscape Management Plans.
Action	Arboriculture and Landscape Route Managers will write Landscape Management Plans for one fifth of the TLRN each year.

2.4 Policy 4 – Landscape and habitat improvements

TfL will seek to realise the potential for wildlife habitat through management of the green estate promoting the conservation and enhancement of biodiversity interest on the TLRN and adjoining land through landscape improvement works which will be programmed in a structured and transparent manner to ensure assets are in a good state of repair.

2.4.1 It is the responsibility of the project manager to engage with the Arboriculture and Landscape Route Managers to ensure all soft landscape proposals on the TLRN are appropriate and meet the policies and business needs of TfL.

2.4.2 Where opportunities arise they should be taken to enable the enhancement or even creation of new habitat areas.

2.4.3 Several biodiversity improvements have been made on the TLRN over recent years including:

- A23 Coulsdon by-pass which used native plants and introduced large areas of wildflower;
- A24 Merantun Way central reserve was planted with woodland trees and shrubs and wildflower linking nearby areas of green space maintained by Merton; and
- The Clean Air Fund allowed TfL to plant more than 600 trees plus shrubs and two green walls in 2010-12.

2.4.4 Food and shelter are essential components of a habitat for fauna. Plants can provide both food and shelter and are therefore one of the simplest means of habitat improvement. TfL will promote the use of locally native species of trees and shrubs in new planting schemes where appropriate. Where ornamental species are to be used, consideration will be given to the value of different species in providing cover, nesting habitat, and as a food source through the year.

2.4.5 The preference for habitat enhancement on the TLRN is to use suitable plants[13] which will encourage wildlife. Shelters such as bird, bat and bee boxes are widely available but alone they have limited benefit.

2.4.6 Defragmentation of habitats has occurred across London and much of the UK so a priority principle for enhancement work for biodiversity is to connect nearby sites or expand existing sites. GiGL has a plan of priority habitat areas for improvement and will be used to inform enhancement works on the green estate. Biodiversity action plans developed by the London Biodiversity Partnership[14] will also be referred to.

2.4.7 Annual work programmes prepared by the Arboriculture and Landscape Route Managers with the LoHAC Environmental and Landscape Managers will incorporate opportunities to conserve and enhance the biodiversity of the green estate.

2.4.8 Routine maintenance on the TLRN, such as the maintenance of sight-lines, will be carried out in a manner which minimises impact on biodiversity, having due regard to operational requirements. Destructive techniques, such as the use of flails, will be avoided and traditional vegetation management techniques will be used wherever practicable.

2.4.9 Within the constraints of the safe operation of the TLRN, TfL will explore opportunities for the continued involvement of local wildlife groups and voluntary bodies in habitat creation and management schemes on the TLRN through agreements with TfL.

[13] Guidance can be found at http://www.joyofplants.com/wildlife/home.php

[14] www.lbp.org.uk/

2.4.10 TfL will continue to develop links with organisations with the responsibility for the management of sites of biodiversity value adjoining the TLRN eg RSPB, London Wildlife Trust, National Trust.

2.4.11 Where possible, planting will avoid the use of non-native species that are listed in the Wildlife and Countryside Act 1981 Schedule 9, especially in more rural locations and where plants may spread with negative impact upon the wider ecology.

2.4.12 This policy contributes towards the NERC Act Biodiversity Duty by demonstrating a commitment and contribution to Biodiversity Action Plans. This policy contributes to the Mayor's Biodiversity Strategy (Proposal 35), the MTS (Proposal 90) and the London Plan (Policy 7.19) by ensuring that the potential for wildlife habitat is realised and promoting collaborative working with other agencies. This policy also meets TfL's environmental objective regarding the enhancement of the natural environment.

2.4.13 In addition to taking account of stakeholder feedback and available budgets, new planting or landscape works will be prioritised as follows:

- Right place, right tree principle
- filling gaps in existing plant cover;
- replacing plants in poor condition (maturity and vitality);
- biodiversity enhancement;
- ability to fulfil the required function and design objective; and
- provision of new planted areas.

2.4.14 Section 17 of the Crime and Disorder Act 1998 will be a consideration for all new planting and landscape proposals. TfL Community Safety, Enforcement & Policing officers will provide site specific guidance.

Action	Before September 2013 Arboriculture and Landscape Route Managers will prepare a structure for the prioritisation of landscape improvements within the use of asset condition. This will enable development a register of sites and projects.
Action	For each TLRN Priority Habitat Site a biodiversity enhancement plan will be developed and incorporated into the Landscape Management Plans by Arboriculture and Landscape Route Managers.

2.5 Policy 5 – Third parties maintaining the green estate

TfL will work with third parties to manage and maintain the green estate on the TLRN.

2.5.1 Safety constraints, such safe working zones for utilities, along with traffic authority requirements, including the requirements for permits and lane rental, makes working on the TLRN difficult for third parties who are not competent contractors.

2.5.2 Third parties such as local authorities, wildlife groups, businesses, local residents groups and guerrilla gardeners may wish to undertake planting or maintenance works. Third parties are able to undertake improvement works to the TLRN through a Section 278[15] agreement which ensures that work carried out on the highway is carried out to agreed standards with the approval of TfL. TfL cannot take responsibility or guarantee the safety of third parties operating on the TLRN without TfL's approval and TfL will stop any works that they consider to be creating a safety risk to any road users or the third party.

2.5.3 Where the proposed work from a third party follows the business needs of TfL and does not result in undue costs or liabilities, the work will usually be allowed subject to the appropriate standards of work being agreed with Arboriculture and Landscape Route Managers. The process for obtaining a Section 278 agreement is set out in TfL procedure SQA-0489 and for the sponsorship of sites in TfL procedure SQA-0159[16].

2.6 Policy 6 – Increase tree population

TfL will seek to increase the number of street trees by 0.5% per year.

2.6.1 TfL has a control measure in place to ensure that trees are only removed for appropriate reasons as set out in SQA-0099 *Removal of Street Trees or other parts of the Green Estate from the TLRN*. This procedure requires the approval from the Director of Roads for tree removal, with approval for safety based removals delegated to Surface Transport's Head of Environment.

2.6.2 To monitor the changes in tree numbers, the Arboriculture and Landscape Route Managers record and report the number of trees that are removed from the TLRN and the number of trees planted on a quarterly basis.

2.6.3 The numbers of trees removed is recorded separately for individual street trees and trees removed from woodland areas. Records for tree removal are kept locally by the Arboriculture and Landscape Route Managers as the delay and accuracy of data from contractors makes NAMS a less reliable source of information for this purpose.

2.6.4 The direct replacement of individual trees which have been removed is often not practicable due to site constraints. Suitable sustainable alternative locations for tree planting will therefore be sought as close as practicable to the location of the removed tree.

2.6.5 The replacement of woodland trees removed as part of woodland management operations such as thinning is not appropriate as there is no net reduction in woodland area. Recording the number of trees in woodlands serves no management function and numbers change over time due to management operations, natural tree failures and natural regeneration. For these reasons, the number of trees removed from woodlands is not counted when calculating the change in the tree population on the TLRN. The number of notable trees removed from woodlands will

[15] Highways Act 1980

[16] The principal lead for Sponsorship on the TLRN is Commercial Development, see Policy 1.

however be reported to the GLA with commentary to enable comparison with historically reported figures.

2.6.6 It is important that tree planting is sustainable. The current population of street trees is generally mature with proportionately few young trees. Working towards a long-term sustainable tree population does not mean planting as many young trees as possible but requires the planned and sustainable planting of trees to avoid an unbalanced tree population in the future. The Mayor aims to achieve a 5% increase in tree cover by 2025. Because measuring canopy cover over the TLRN is not a reliable indicator, TfL will instead measure tree numbers and aim to plant more trees than are removed each year, with an increase in the tree population by 0.5% each year.

2.7 Policy 7 – Tree risk management

TfL will seek to ensure that the safety risks presented by trees are managed to recognised industry standards and guidance.

Risk of tree failure

2.7.1 All trees present a potential risk and the management of that risk is the responsibility of the owners and managers of the land on which they grow.

2.7.2 Management of the street tree population requires a balance to be struck between the need to conserve trees as an asset and the risks associated with trees in an urban situation. Achieving this balance combines the following:

- a professional understanding of the extent and condition of tree population;
- informed advice from qualified arboriculturists on the condition of the tree population, risks posed and options associated with street tree management;
- promoting a better understanding by TfL staff, contractors and the wider community of the threats to street trees
- promoting a better awareness by TfL staff, contractors and the wider community of the benefits of trees as a resource; and
- ensuring the highest possible standards are achieved in tree care and management.

2.7.3 As highway authority for the TLRN, TfL has power to serve the owner with a Section 154 notice under the Highways Act 1980[17]. This is a discretionary power and does not take away responsibility from the tree's owner.

2.7.4 Government guidance recommends a default frequency for tree surveys as once every five years[18], noting that this should be changed to reflect local characteristics. Given the nature and use of the TLRN, the frequency of tree surveys is greater and is described in Policy 2. The approach to tree risk

[17] SQA-0233 – Removing private trees, shrubs and hedges on TLRN

[18] Well-Maintained Highway – Code of Practice for Highway Maintenance Management (TSO, 2005)

management takes follows published best practice including Well-Maintained Highways[19], Common Sense Risk Management of Trees[19] and Principles of Tree Hazard Assessment and Management[20].

2.7.5 Roads Directorate undertook benchmarking through LTOA with Croydon, Hackney, Hillingdon, Southwark and Westminster in July 2009. One of the conclusions was that "TfL inspection regimes are good in comparison with boroughs, reflecting that the TLRN comprises the busiest roads."

2.7.6 The tree surveys are primarily designed to highlight defects that may lead to harm or damage to people and property. The benefits that trees offer can be considerable and the consideration of tree benefits should be taken into account, as highlighted by the National Tree Safety Group.

2.7.7 The value or the benefits of a tree do not change the likelihood of harm or the level of risk. The benefits are, however, taken into account when the need for, type of, and extent of remedial works is being considered. This is particularly relevant in cases of tree strikes by high-sided vehicles where high-cost engineering solutions may be required if the tree is considered worthy of retention.

2.7.8 TfL recognise that operations carried out by other service providers and developers working on or adjacent to the TLRN have the potential to impact on trees. TfL will seek to work closely with local authority Tree Officers to improve the interface between TfL, London local authorities, other service providers, developers and neighbouring landowners.

Vehicle strikes

2.7.9 Vehicles, predominantly high-sided vehicles, can strike stationary trees as the vehicle passes. Some of the common reasons for high-sided vehicle strikes include trees leaning towards the carriageway, low branches, adverse camber of the highway, narrow lanes, loading bays and bus stops close to trees. Pruning should be undertaken when it can resolve the problem without detriment to the health of the tree.

2.7.10 TfL aims to avoid the removal of trees, especially mature trees, where alternatives such as redesigning the highway are a viable solution. Arboriculture and Landscape Route Managers will work with highway engineers to investigate solutions in the case of vehicle strikes.

2.7.11 At the end of 2012, all trees known to have evidence of vehicle impact were surveyed by the Highway Maintenance Work Contractors. A schedule of recommendations was prepared and these are being implemented with a combination of pruning, felling and engineering solutions.

2.7.12 It is essential that tree planting locations are suitably sited to prevent future instances of vehicle strikes. Trees should not be planted too close to the kerb (see Policy 11) and they should also be planted away from buildings

[19] 'Common sense risk management of trees – Guidance on trees and public safety in the UK for owners, managers, and advisers' (National Tree Safety Group December 2011)

[20] Principles of Tree Hazard Assessment and Management by David Lonsdale (HMSO, 1999)

and mature trees, including those on adjacent land, which may cause trees on the TLRN to grow towards the road.

Incident recording and review

2.7.13 In the event of a serious incident, TfL will instruct the LoHAC to retain the tree or branch which failed and undertake post-incident investigation to establish the cause of failure. Where a claim for damages is likely, the tree or branch will be retained as evidence to be assessed by appointed expert witnesses. Where a claim for damages as a result of a tree failure is likely, the TfL Claims Handler will be notified and the claims handling procedure SQA-0173 will be followed.

2.7.14 Following a tree failure, the respective Arboriculture and Landscape Route Manager will share information and lessons learnt with the other Arboriculture and Landscape Route Managers to inform future management. TfL will maintain a central register of tree failure incidents.

Action	Arboriculture and Landscape Route Managers will ensure that the recommended actions from the 2012 vehicle strike survey are implemented to control the risk of vehicle strikes.
Action	Arboriculture and Landscape Route Managers will develop a proforma and central register for recording tree failure incidents by end of July 2013 and share knowledge in arboriculture and landscape meetings with a view to looking for trends and new risks.

2.8 Policy 8 – Tree asset value

TfL recognises the environmental and monetary value of the street tree asset on the TLRN.

2.8.1 TfL recognises the wider environmental benefits of trees but records a monetary valuation for individual trees on the TLRN as part of the tree condition survey. This helps to demonstrate that trees appreciate in value, in contrast to other highway assets which depreciate over time. The asset valuation system used is the Full Method of the CAVAT system which is published by the LTOA. The monetary value with supporting information is recorded in NAMS as part of the Tree Condition Survey for each individual tree.

2.8.2 It must be noted that when CAVAT values are being considered, this is broadly a replacement cost approach to tree valuation. CAVAT is therefore not a system which records an annual benefit or ecological value for individual trees.

2.8.3 Subsidence claims which allege that trees owned by TfL are contributing to damage to property are investigated based upon the evidence available as set out in Policy 15. Following the principle of the LTOA's Joint Mitigation Protocol, TfL requires higher levels of proof for trees with a higher monetary value. As a minimum requirement for subsidence claims, TfL requires proof of seasonal movement, root identification and a report summarising the extent of damage to the property. In order to form a balanced judgement,

TfL also needs to know the cost of settling the claim with the tree removed and the cost of settling the claim with the tree retained. These costs are entered by the Arboriculture and Landscape Route Managers on the form to request the Director's approval to remove a tree, if all the above evidence has been provided to the satisfaction of the Arboriculture and Landscape Route Manager.

2.8.4 Third parties sometimes cause harm or damage to trees on the TLRN. Arboriculture and Landscape Route Managers will work with third parties, including developers and statutory undertakers, to minimise detrimental impact on the green estate. Where trees are removed or heavily pruned to enable third party development or as a result of damage by third parties, TfL will seek to recover compensation for the loss based on the CAVAT valuation from the previous condition survey or a revaluation if this can be done before the felling or pruning is undertaken.

2.8.5 Where a tree requires remedial works to make it safe, the change in value of the tree be taken in to account. For example, where the cost of undertaking work to maintain a tree is greater than its value, its retention may not be cost-effective and replacement should be considered as a sustainable alternative.

2.8.6 Veteran trees on the TLRN are individually recorded in NAMS due to their value which is partly due to their scarcity but primarily their biological, cultural or aesthetic qualities.

2.9 Policy 9 – Tree works

TfL will manage street trees in a sustainable manner in accordance with current best practice and recognised industry standards for tree works.

2.9.1 Tree works will be carried out in accordance with the Manual for Highway Works Section 3000[21] which incorporates BS3998:2010 Recommendations for Tree Works, along with variations to the specification in the LoHAC contracts.

2.9.2 All tree works are carried out by qualified arborists. TfL requires operatives to hold certification recognised by the Arboriculture and Forestry Advisory Group as authorised by the Health and Safety Executive for the use of chainsaws to fell trees, use of chainsaws from a rope and harness and undertaking aerial rescue, among other related qualifications.

2.9.3 TfL will seek to ensure that all works carried out by third parties on the TLRN comply with this strategy and any other recognised industry standards and best practice.

2.9.4 Where necessary, inspections to agree proposed tree works will be attended by the Arboriculture and Landscape Route Managers, the LoHAC Landscape Managers and the arboricultural contractor.

[21] 'Manual of Contract Documents for Highway Works – Volume 1 Specification for Highway Works' (Highways Agency, May 2001)

2.9.5 The Arboriculture and Landscape Route Managers will make an assessment for the presence or risk of bats and nesting birds prior to pruning and felling operations, and may commission a specialist ecological survey if required. It is also the responsibility of the operatives undertaking the works to check for bats and birds before and during works.

2.9.6 Unless there is an overriding justification and no alternative, tree works requested by third parties will not generally be approved to address complaints in respect of the following:

- loss of daylight to adjacent properties;
- to prevent the fall of leaf, twigs, flowers or fruit;
- pollen allergy;
- to reduce use of trees by birds or other animals and insects;
- sightlines for shop frontages or advertising; or
- to improve reception from wireless, television or satellite antennas where aerials or antenna have been installed without proper recognition of tree growth.

2.9.7 Tree works may be undertaken when:

- previous management e.g. pollarding, requires a continued programme of work;
- highway safety or infrastructure is compromised;
- the tree presents an unacceptable risk of failure;
- pests and diseases need to be and can be controlled through tree works;
- an actionable nuisance needs to be abated; or
- professional management requires the removal of self-set trees and individual trees as part of woodland thinning operations.

2.10 Policy 10 – Green estate protection

TfL will integrate the protection of the green estate into all relevant areas of service, delivery and functions and will manage the TLRN in a manner which protects, maintains and enhances the green estate in line with current recognised industry standards, best practice guidance and statutory obligations.

Trees

2.10.1 TfL's environmental assurance processes ensure that any highway works are reviewed by environmental professionals to ensure that negative impacts are recorded and where possible mitigated. The Environmental Manager (ST) is responsible for completing or approving the record.

2.10.2 The Arboriculture and Landscape Route Managers will assess proposed works on the TLRN to ensure compliance with relevant British Standards and other industry best practice guidance, including from NJUG which

requires utility companies to work with care close to trees and sets out minimum standards.

2.10.3 Where damage to a tree or trees occurs TfL may take action against the utility company or other third parties to recover any costs, including the monetary value of the trees affected. As detailed in Policy 8, the compensation recovered from the utility company or other third parties shall be:

- CAVAT value of the lost tree(s);
- the reduction of CAVAT value resulting from the damage and any associated remedial works;
- funding the planting of replacement trees to agreed standards with Arboriculture and Landscape Route Managers: and/or
- reasonable costs incurred by TfL.

2.10.4 When the Arboriculture and Landscape Route Managers review proposed work that may have a negative impact on trees, the primary consideration will be the protection and retention of trees (see Policy 6). A method statement will need to be approved by Arboriculture and Landscape Route Managers in advance of the works to show how the trees will be protected.

2.10.5 As a statutory undertaker, TfL and its agents are exempt from Tree Preservation Order and Conservation Area [22] restrictions for tree work where the tree is on operational land and work is required to fulfil the function of a highway authority. Arboriculture and Landscape Route Managers work with Local Authorities to ensure that they are aware of proposed works that may affect trees within Tree Preservation Orders or Conservations Areas.

Biodiversity

2.10.6 All schemes must take account of known locally protected species or habitats as well as injurious weeds. Assessment of the potential impact on these will be carried out for all capital renewal works and maintenance schemes. Assessment will be carried out in accordance with current ST Environmental Management System procedures. Contractors will also be required to have systems and procedures in place to assess the potential impact of their activities on biodiversity.

2.10.7 Where a negative impact on biodiversity is likely, then measures to remove, reduce or mitigate the risk must be taken prior to commencement of works. Where operations on the TLRN have the potential to impact on the biodiversity interest of adjoining land, TfL will seek early consultation with statutory bodies and organisations responsible for the management of those adjoining sites. Where necessary, TfL will submit applications and method statements to obtain licences where disturbance of statutory protected species or habitat is unavoidable.

2.10.8 Operations likely to cause disturbance to nesting birds will not be carried out during the bird nesting season (usually end February to end July) unless

[22] The Town and Country Planning (Tree Preservation)(England) Regulations 2012 s14 and s15

required for essential safety works. Where necessary, a survey for the presence of nesting birds will be carried out by a suitably qualified ecologist prior to the commencement of operations.

2.10.9 Arboriculture and Landscape Route Managers and STET will work with project managers to provide advice on how to protect biodiversity. Where required, TfL will employ suitably qualified and/or licensed specialists to advise on the survey, protection and management of individual species or habitats. External expert advice will be sought through the TfL Framework contractor, all engagement with the Framework contractor will be facilitated by STET.

2.10.10 This policy contributes towards the NERC Act Biodiversity Duty by integrating biodiversity considerations into all relevant service areas and functions, ensuring that biodiversity is protected and demonstrating a commitment and contribution to Biodiversity Action Plans. This policy also meets TfL's environmental objectives regarding the protection of the natural environment.

Action For each TLRN Priority Habitat Site a biodiversity protection plan will be developed and incorporated within the Landscape Management Plan.

2.11 Policy 11 – Tree planting

TfL will ensure that all tree planting on the TLRN is carried out in sustainable locations and in accordance with current recognised industry standards and best practice.

2.11.1 Tree planting shall be carried out in accordance with the requirements of highway maintenance contract specification. Variation to the standard detail should only be made where local character or site factors require changes to be made, such as a different tree pit size or the use of tree guards.

2.11.2 Both direct replacement and additional tree planting is principally funded from the capital tree planting budget. Additional trees may also be funded through improvement scheme and third party development. Value for money is considered as part of all tree planting proposals to ensure that both the cost of tree planting and long-term maintenance requirements are accounted for.

2.11.3 Fundamental to tree planting is selecting the right location. Historically trees have been planted in locations which have been inappropriate for either the development or maintenance of the tree. Planting too close to the kerb and near other trees can cause trees to grow too close to passing traffic resulting in vehicle strikes. Planting in central reserves requires sufficient space for the tree to grow to its natural size and to allow for access for establishment and long term maintenance. Central reserves are particularly difficult to establish trees where heat radiates from the road surface and soil moisture is not readily available.

2.11.4 Tree planting locations, species and planting specifications shall be subject to approval by the Arboriculture and Landscape Route Managers.

2.11.5 Tree planting is a long-term investment and decisions on tree planting must take account of this. Designers, contractors and Arboriculture and Landscape Route Managers shall take account of the following when considering and undertaking tree planting on the TLRN:

Purpose

- Function e.g. screening, wildlife, continuity, noise or air pollution mitigation;

Site constraints

- Street signs and traffic lights;
- Location of street lights (BS5489-1), 5m clearance is recommended;
- Proximity to dropper kerb, 1.5m clearance is recommended;
- Section 17 of Crime and Disorder Act 1998;
- 1.2m minimum of unhindered footway access (see Streetscape Guidance);
- Proximity to the carriageway (no trees shall be planted within 500mm of the carriageway edge);
- Designated parking;
- Proximity to other trees on TLRN;
- Off-site and other nearby trees which may cause development of the new tree to grow towards the highway;
- Presence of and visibility splays of CCTV units;
- Proximity of buildings, their use, windows and access;
- Heritage features, including sightlines for them;
- Presence of utilities, underground and overhead;
- Soil depth especially on or near structures;
- Likelihood of subsidence based on historic claims knowledge;
- Advertisement hoardings;
- Sightlines, especially at junctions;
- Structures including boundary walls;
- Programmed highway schemes in the area which may affect the planting location;
- Access to maintain the tree during establishment and when mature;
- The need for road restraint systems, on roads of 50mph or greater this must be assessed with Road Restraints Risk Assessment Process[23];

[23] http://www.dft.gov.uk/ha/standards/tech_info/rrrap.htm

Tree specific issues

- Ultimate height, crown spread and stem diameter of the species;
- Honeydew from aphids;
- Fruit fall;
- Ability to cope with a changing climate;
- Pests and diseases;
- Management regime for the tree and need for access;
- Scale of setting;
- Wildlife and Countryside Act 1981 Schedule 9; and
- Climate change adaptation benefits, including shade.

2.11.6 Tree species shall be selected on the basis of professional arboricultural advice and taking account of the information available on www.right-trees.org.uk – the web-based tool launched as part of the Mayoral initiative 'Right Trees for London's Changing Climate Project'. The tree species planted should take account of existing trees and the long-term aspiration for the trees in the area recorded in the Landscape Management Plan (Policy 3).

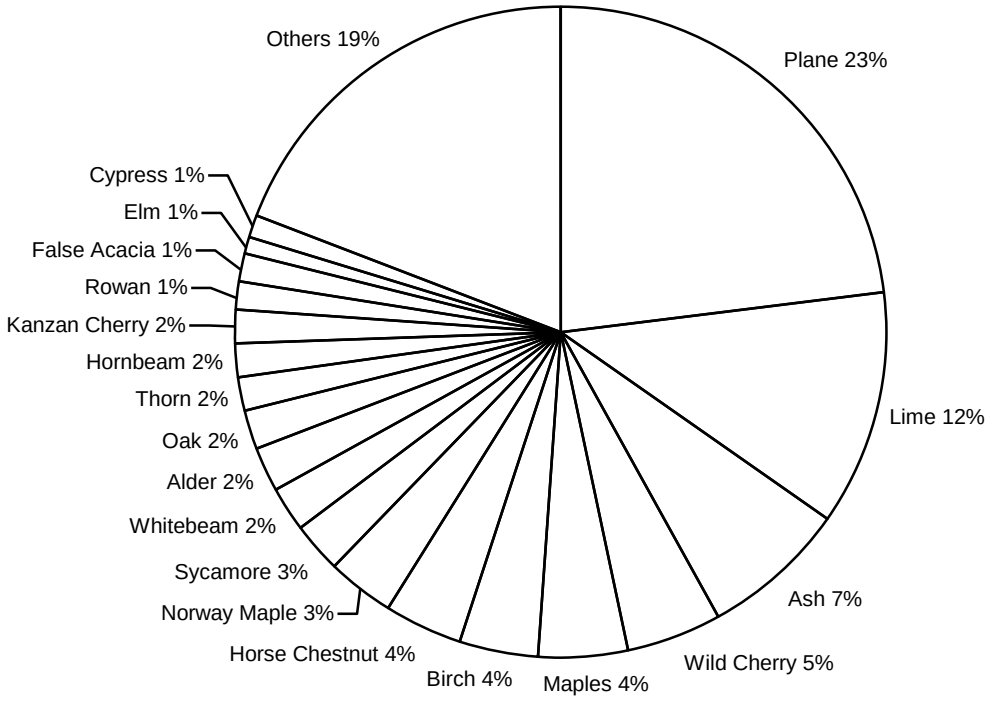
2.11.7 The Arboriculture and Landscape Route Managers will be responsible for reviewing all tree planting and other landscape proposals on the TLRN.

2.11.8 In addition to taking account of stakeholder feedback and available budgets, tree planting will be prioritised in the following order:

1. Replacement planting
2. New trees within new landscape schemes
3. Planting in empty tree pits from tree removal in past years
4. New tree sites in areas of few or no trees (under the right place, right tree principle)
5. New tree sites in areas with many trees

2.11.9 A diverse population of trees is essential to ensure resilience to a changing climate and the threat of pests and diseases. The current tree population is made up of many different species with plane the most common tree as shown in Chart 1.

Chart 1. Proportion of tree species on TLRN, excluding woodlands. 'Others' captures all species of less than 1% each.



2.11.10 Various guides have been published recommending limits of single species and genus within an urban tree population which are generally 10-15%[24]. A tree population should be diverse in structure but this does not prohibit the use of single species along streets to form avenues. The use of trees proven to be suitable in an urban environment will be used. New varieties will be introduced with caution and monitored to understand how they develop before introducing them on a wider scale.

Action	Arboriculture and Landscape Route Managers will survey all empty tree pits for possible replacement tree planting. If surveys show tree pits are no longer viable to accommodate trees then this will be recorded in the Landscape Management Plan and the tree pits paved.
Action	Arboriculture and Landscape Route Managers develop a pan-TLRN plan for long-term planting to identify opportunities for replacement and additional tree planting in alternative locations. This will be recorded in the Landscape Management Plans for each road (Policy 3).
Action	Arboriculture and landscape route managers will work together to agree how tree planting is specified and also work closely with each other when planting additional trees and share positive and negative experiences.

[24] Raupp MJ, Cumming AB and Raupp EC 2006 Street tree diversity in Eastern North America and its potential for tree loss to exotic borers, Arboriculture and Urban Forestry 2006. 32(6):297-304

2.12 Policy 12 – Tree establishment and development

TfL will ensure that all newly planted trees receive systematic post-planting maintenance until they are established.

2.12.1 With the exception of woodland planting, all trees will be watered sufficiently to ensure their survival for the first three years after planting. Where any tree dies within this period it shall be replaced by the contractor, at the contractor's expense. Within this three year period, young trees will receive aftercare maintenance including formative pruning, adjustment and removal of stakes and ties, and mulching.

2.12.2 The maintenance for the first three years post-planting is built into variations of MHW Series 3000, it is therefore not instructed as an additional item. However, where trees are planted by third parties or a different contractor, then the LoHAC contractor may be instructed to continue maintenance through the first three years as required by the Arboriculture and Landscape Manager.

2.12.3 Survival to three years post-planting is not regarded as an established tree by TfL. Formative pruning to maturity will be undertaken on a cyclical basis to ensure the tree develops to suit its location and does not become an obstruction to the highway or users, and has no irremediable structural defects in maturity.

Action Arboriculture and Landscape Route Managers will develop a specification and programme for the formative pruning of trees by October 2013.

2.13 Policy 13 – Planned tree works

TfL will ensure that at least 40% of the tree maintenance work is done on a systematic, regularly scheduled cycle[25].

2.13.1 Epicormic shoots will be pruned from street trees annually. This may be more frequent where the shoots present a safety concern by reducing footway access or obscuring visibility splays.

2.13.2 Planned tree works will typically be undertaken on a five year cycle with one road section pruned at a time. The planned pruning of a road or section of road at a time means that traffic management and permits to work can be programmed to reduce disruption of traffic and make maximum use of road space. The use of planned tree work reduces the need for ad-hoc safety pruning which requires permits and associated traffic management.

2.13.3 Where there are 'hot-spots' with high frequencies of subsidence cases, an increased frequency of heavy pruning will be undertaken. This will typically be crown reduction or pollarding on cycles of two to three years.

2.13.4 Crown lifting will be undertaken as part of planned tree works to achieve a clearance of 2.5m over footways, 3m over off carriageway cycle lanes and

[25] 'Trees in Town 2 – A new survey of urban trees in England and condition and management' (Communities and Local Government, 2008)

5.5m over the carriageway and follows Highways Agency guidance[26]. The crown lifting will remove low branches to provide clearance but does not specifically address the problem of vehicle strikes of tree stems which is covered in Policy 7.

2.14 Policy 14 – Working with others

TfL will co-operate with and provide consistent information to the GLA, London local authority Tree Officers, GiGL, the public, residents groups, local businesses and other relevant agencies concerning tree related activities and issues.

2.14.1 TfL will promote greater awareness of the importance and benefits of street trees and the need to protect and care for this asset through implementation of this GEMP.

2.14.2 The Arboriculture and Landscape Route Managers will work with the LoHAC contractor and other contractors to ensure local authority tree officers and other stakeholders are informed of proposed tree works to significant or notable trees, prior to the commencement of works on site. This may include preparing a press statement and/or delivering letters to local residents and businesses.

2.14.3 TfL will continue to be a member of the LTOA. Arboriculture and Landscape Route Managers will attend LTOA meetings to promote the work of TfL and benchmark activities relating to tree management with other members.

2.15 Policy 15 – Third party claims

TfL will act in accordance with current best practice and industry guidance in respect of third party claims of direct or indirect damage.

2.15.1 All third party claims which allege damage caused by trees on the TLRN will be managed by TfL's Claim Handlers following process SQA-0173 Insurance Claims. Arboricultural advice will be taken from Arboriculture and Landscape Route Managers as part of the Insurance Claims process.

2.15.2 In cases of alleged tree root damage, the presence of a tree does not prove that it is responsible for any damage. Damage to property can also be caused by:

- natural seasonal moisture changes of soil (excluding impact of trees);
- structural deficiencies;
- inadequate foundations for ancillary structures e.g. bay window, conservatory, garage;
- land slip;
- replacement windows not properly supported;
- vibrations from passing vehicles or trains;
- other trees or shrubs in the vicinity (present or recently removed);

[26] HA108/04 'Landscape Management Handbook' (The Highways Agency, 2004)

- other forms of water loss;
- damaged drainage systems; and
- heave.

2.15.3 The evidence required for any claim of indirect damage will vary depending upon factors such as CAVAT value and local frequency of claims but a minimum requirement of information will be required to establish:

- seasonal movement;
- extent of damage to the property; and
- presence of roots from TfL's tree(s) from below foundations.

2.15.4 Tree pruning may be undertaken either as a precautionary measure or as part of a risk reduction/mitigation programme. Such work will only be undertaken following guidance from the Claim Handlers to ensure that it does not prejudice TfL's position. Tree pruning, whether branches or roots, shall only be undertaken following recommendations and overview from Arboriculture and Landscape Route Managers.

2.15.5 Tree removal will only be undertaken in relation to a claim for damages after:

- sufficient evidence has been received which shows on the balance of probabilities that the tree has contributed to the damage;
- taking account of the value of the tree and the cost of settling the current, past and/or future claims; and
- approval to remove the tree has been given by the Director of Roads in line with SQA-0099 Removal of Street Trees or other parts of the Green Estate from the TLRN

2.15.6 Tree works will generally be approved in respect of the following:

- Proven claims relating to soil shrinkage/subsidence and consequent damage to foundations of buildings or other significant structures, eg high walls following the application of the above procedure.
- Where trees are preventing the reasonable use or safe access to an adjoining property.

Action Arboriculture and Landscape Route Managers will develop a list of subsidence hotspots working with TfL Claims Handler. These hot spots will have tree management programmes detailed in the Landscape Management Plans to control the risk of further claims.

2.16 Policy 16 – Woodland management

TfL will proactively manage woodlands on the TLRN to continue their designated function.

2.16.1 To date, little active management of woodlands has been undertaken by TfL. Semi-natural woodlands on the TLRN provide a valuable habitat which needs to be managed to ensure they continue to provide the functions and benefits intended by the designer. Proactive management of woodlands

through thinning, halo pruning, felling, regeneration control, coppicing and scrub control are important activities to ensure diverse and continued woodland cover.

2.16.2 TfL will undertake a review of woodlands on the TLRN and undertake cyclical works typically on a ten year programme. The programme of works will be designed and undertaken to ensure the environmental functions of screening, integration, nature conservation and/or visual amenity are retained and/or enhanced.

2.16.3 Where it is safe to do so, the retention of standing deadwood and log piles as habitat piles should be undertaken to benefit birds such as woodpeckers as well as wood-boring invertebrates.

Action Arboriculture and Landscape Route Manager will develop a system for recording and managing woodlands by September 2013.

2.17 Policy 17 – Pests and diseases

TfL will proactively manage trees to control the impact and risk of spreading pests and diseases.

2.17.1 Trees have always been subject to infestation and infection from many pests and diseases. With increased movement of plants and material around the world and changes in climate, there is an increased threat of pests and diseases not normally found in the UK. TfL will follow best practice guidance to control the spread and impact of new pests and diseases. Where practicable, TfL will also work collaboratively with boroughs to ensure a coordinated approach to control.

2.17.2 Over reliance on a single tree species will result in a tree population that is more vulnerable and less able to cope with new pests and diseases (see Policy 11). Dutch elm disease devastated the British landscape with the loss of many thousand elms over a relatively short period of time. Diseases such as canker stain in plane have the potential to cause similar impact in the urban environment, so having a diverse resilient tree population is important.

2.17.3 There are several pests and diseases that require specific control and management precautions. Below is a summary of current pests and diseases of note.

Oak processionary moth (OPM)

2.17.4 OPM caterpillars can defoliate oak trees reducing the tree's vitality. They develop toxic hairs which can cause severe skin and respiratory reactions. The caterpillars and pupae therefore need be controlled to avoid the risk of harm to people.

2.17.5 Control of OPM is undertaken through the application of insecticides and/or the removal of nests. Personal protective equipment must be used by operators during OPM works.

2.17.6 Arisings from pruning oak trees in OPM areas will not be removed from the OPM area to prevent the accidental spread of OPM, unless this presents a safety risk to highway users or agreed with the Forestry Commission. The

planting of oak trees will not be undertaken in the OPM control areas, so alternative species will be selected and approved by the Arboriculture and Landscape Manager.

Massaria on plane (*Splanchnonema platani*)

2.17.7 Massaria is a fungal infection which affects plane trees and typically causes the top side of a branch to develop a lesion and cause decay of the branch leading to its failure. Affected branches tend to be less than 150mm in diameter and located in the lower crown. Massaria is often found in dense crowns with less air flow and might be linked to drought stress.

2.17.8 LTOA is drafting a guidance document for tree managers to be published in 2013. This guidance is expected to recommend a light touch approach, with the use of aerial inspections and targeted removal of affected branches.

Canker stain of plane (*Ceratocystis platani*)

2.17.9 Canker stain of plane is a fungal infection increasingly widespread in Europe, but not yet present in the UK. The canker infects open wounds causing dysfunction in the xylem leading to decline and death of trees. It can also spread via root grafts and where present it has made a major impact on the tree population. This is a big risk to London planes if it spreads to the UK.

Ash dieback (*Chalara fraxinea*)

2.17.10 Ash dieback is a fungal infection which has been introduced from the continent where up to 90% of ash have been affected. The fungus causes the dieback of the ash tree and secondary infection, often honey fungus in woodlands which kills the tree and/or causes it to become unstable. The process of decline can take several years, so taking immediate action is not necessary where the disease is found in established trees. Current guidance from the Forestry Commission is to retain ash trees unless they are a hazard.

2.18 Policy 18 – Awareness of trees, landscape and biodiversity

TfL will raise awareness of staff and contractors with regard to trees, landscape and biodiversity.

2.18.1 In addition to having processes and procedures in place which address the impact of activities on the green estate and biodiversity TfL also needs to raise awareness of such process and procedures. Raising awareness of these is required along with raising awareness of why green estate and biodiversity is important. This will be achieved through the following actions.

Action	Circulation of GEMP through All Roads Quality Bulletin.
Action	Circulation of TLRN Priority Habit Sites protection and enhancement plans and Landscape Management Plans.

Action	Plans of the TLRN Priority Habitat Sites will be made available on TfL geographic information systems.
Action	Production of toolbox talks relating to biodiversity protection and enhancement. These toolbox talks will be made available on internal websites and will form part of environmental awareness presentations.
Action	Annual publication of case studies and progress towards the achievement of this GEMP on TfL and Contractors' magazines and websites.
Action	Work in partnership with conservation bodies and local authorities to raise the profile of the biodiversity value of the TLRN.

2.19 Policy 19 – Injurious weed management

Roads Directorate will work to eradicate giant hogweed and reduce the extent of Japanese knotweed on its estate.

2.19.1 In addition to the many protected species associated with the TLRN, there are several non-native and invasive species which out-compete native species and can damage infrastructure or cause harm. The London Invasive Species Initiative[27] lists the many plants and animals invasive in London.

2.19.2 A record of all known sites of giant hogweed and Japanese knotweed are kept in NAMS. Both giant hogweed and Japanese knotweed are controlled substances[28], causing them to grow in the wild is a criminal offence and they must be disposed of as controlled substances when removed from site. Both of these plants cause significant damage so are controlled following best practice.

2.19.3 Giant hogweed will be eradicated where it is known to be present through repeated use of herbicide to control established plants and prevent it from producing seed.

2.19.4 Burying Japanese knotweed, in accordance with Environment Agency guidance, on site is typically not practicable so the normal method of control used is repeated application of herbicide. This can reduce the vitality of the plant but given the large reserves of energy in the rhizome this can only be effective as part of an ongoing programme of work over several years.

2.20 Policy 20 – Biodiversity indicators

TfL will develop and demonstrate progress against biodiversity indicators and targets.

2.20.1 Given the variability of the TLRN from central London to the urban fringe as well the narrow linear nature of the highway estate, setting absolute targets can be challenging, potentially misleading and therefore may not be suitable indicators of biodiversity.

[27] London Biodiversity Partnership

[28] www.nonnativespecies.org

2.20.2 Achievements have already been made with the introduction of wildflower swards and planting new street trees and woodland.

2.20.3 In the context of the TLRN, the total measure of green estate assets is not an indicator of biodiversity as it does not record the quality of the asset and its value to biodiversity.

Action	Arboriculture and Landscape Route Managers and Surface Transport Environment Team will develop indicators and targets for biodiversity on the TLRN in line with TfL wide environmental strategies and targets by end of April 2014.

3 Closing statement

3.1.1 This document shows how Roads Directorate follows best practice in the management of the green estate and it sets actions to make improvements.

3.1.2 This document will be reviewed annually to monitor progress and ensure it is still relevant. Actions will be reviewed at arboriculture and landscape meetings which are held every 6 weeks where knowledge and experiences are shared to develop management of the green estate

Appendix 1 – Summary of relevant legislation

- *Health and Safety at Work Act 1974* – sets out the general duties which employers have towards employees and members of the public. The law requires employers to look at what the risks are and take reasonable measures to control them.
- *New Roads and Street Works Act 1991* – places a statutory duty on highway authorities to co-ordinate highway works to minimise inconvenience to road users and requires all those wanting to carry out roadworks on the highway (such as gas, water and telecommunication companies) to co-operate in this process.
- *Traffic Management Act 2004* – places a statutory duty, known as the Network Management Duty, on traffic authorities to keep all forms of traffic moving on their road network and the networks of surrounding authorities.
- *Road Traffic Regulation Act 1984* – provides powers to regulate or restrict traffic on UK roads in the interest of safety and can include speed limits, road signs, parking and special events.
- *Road Traffic Act 1988* – the regulation and use of all vehicles on roads and the conduct of drivers. Includes road safety, the licensing of drivers of vehicles and insurance requirements.
- *The Environmental Protection Act 1990* – provides the fundamental structure and authority for waste management and control of emissions into the environment.
- *The Equality Act 2010* – an act that consolidates anti-discrimination law and requires equal treatment in access to employment as well as private and public services, regardless of age, disability, gender reassignment, marriage and civil partnership, race, religion or belief, sex, and sexual orientation.
- *Greater London Authority Act 1999* – established the Greater London Authority (GLA), London Assembly and Mayor of London and transferred responsibility for strategic planning in London from central government to the Mayor of London.
- *The Construction (Design and Management) Regulations 2007* – aim to improve safety in the construction industry by focusing attention on effective planning and management of construction projects, from design concept onwards. The aim is for health and safety considerations to be treated as a normal part of a project's development, not an afterthought.
- *Town and Country Planning Act 1990* – relates to town and country planning and regulating the development of land and gives local authorities the power to make tree preservation orders.
- *Town and Country Planning (Tree Preservation)(England) Regulations 2012* – sets out how tree preservation orders should be made and managed and this regulation consolidates historic regulations.

- *Forestry Act 1967* – sets out the general duties of promoting the interests of forestry. The need for a felling licence when felling over 5 cubic metres per calendar quarter is set out along with exemptions.
- *Wildlife and Countryside Act 1981* – is the principal mechanism for the legislative protection of wildlife in Great Britain. The act gives protection to native species (especially those at threat), controls the release of non-native species, enhances the protection of SSSIs and builds upon the rights of way rules in the National Parks and Access to the Countryside Act 1949. Part 1 of the 1981 Act makes provision for the protection of plants, animals and in some cases their habitats. The level of protection afforded to individual species varies, as described in the Act. In some cases this protection has been extended through subsequent legislation eg The Protection of Badgers Act 1992.
- *Countryside and Rights of Way Act 2000* – includes provision for public access to the countryside, widely known as the public's "right to roam", as well as public rights of way law and creation of traffic regulation orders for the purpose of conserving an area's natural beauty.
- *Occupiers Liability Act 1957 & 1984* – relates to the duty of care that those who occupy property (through ownership or lease) owe to people who visit or trespass. It deals with liability that may arise from accidents caused by the defective or dangerous condition of the premises.
- *Pesticides Act 1998* - regulations concerning the control and use of pesticides and gives local authorities powers to seize and dispose of pesticides. *The Plant Protection Products Regulations 2009* and *The Plant Protection Products (Sustainable Use) Regulations 2012* set out high and uniform requirements for good practice in the use of pesticides.
- *Natural Environment and Rural Communities (NERC) Act 2006* – introduced a Biodiversity Duty on all public authorities. Delivery of this Duty is likely to require evidence that the public authority has:
    - 'identified and taken opportunities to integrate biodiversity considerations into all relevant service areas and functions, and ensured that biodiversity is protected and enhanced with current statutory obligations;
    - raised awareness of staff and managers with regard to biodiversity issues;
    - demonstrated a commitment and contribution to Biodiversity Action Plans, where appropriate; and
    - demonstrated progress against key biodiversity indicators and targets'[29]
- *Environment Act 1995* – sets out the formation of Environment Agency and the protection of hedgerows.

[29] 'Guidance for Public Authorities on implementing the Biodiversity Duty' (Defra May 2007)