Highway Infrastructure Asset Management Plan (HIAMP)

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FOREWORD TO THE SOUTHWARK COUNCIL HIAMP

Southwark's Highway infrastructure provides a fundamental piece of the borough's urban fabric and public realm.

Southwark's public realm is continuing to develop and it is important that we implement an approach which ensures we continue to look after the ever changing environment for the future. In having well maintained highways assets we will also develop surroundings which will help encourage people to use the borough's services and amenities and promote a sense of safety and well being as well as contributing to regeneration.

With a value of in excess of £1,000m the Highway infrastructure is one of Southwark Council's most important assets and in these tough economic times it is important that we manage our assets effectively, prioritising our spending to ensure value for money and providing efficient services.

This Highway Infrastructure Asset Management Plan (HIAMP) sets out how we currently manage and maintain the assets we have, how we will use our resources and identifies how we can continue to improve the services we provide in support of those assets.

EXECUTIVE SUMMARY

Southwark Council's 332 kilometres (207 miles) of road network and 754 kilometres of footway is critical to the well-being of the residents of Southwark, while also being strategically important for travelling to and between other parts of the Capital. The preservation, maintenance and improvement of this highway network itself together with its wide range of associated infrastructure is therefore vital to the economic and social well-being of Southwark.

This HIAMP sets out for the benefit of stakeholders the policies and investment criteria needed to keep all highway assets in a safe and operational state within the most efficient and effective manner, both on a day to day basis and in the long term.

The highway assets within the scope of this HIAMP include:

- Carriageways
- Footways
- Street lighting
- Highway structures
- Highway surface water drainage
- Street furniture.

This HIAMP has been prepared using current best practice and experience available from various published documents but particular reference has been made (see Appendix 2 and 3) to 'Well-managed Highway Infrastructure – Code of practice' published by the UK Roads Liaison Group, together with the 'Highway Infrastructure Asset Management Guidance Document' published through the Highway Maintenance Efficiency Programme (HMEP). HMEP highlighted the potential for a gain in value for money and service improvement benefits by adopting an asset management approach, also emphasising that this would support better financial control and effective long term management of highway assets.

An Improvement Plan generated in part from a Gap Analysis has been produced as part of the development of this version of Southwark Council's HIAMP. These are detailed in the **HIAMP Addendum Section 07 – Gap Analysis and Improvement Plan.** It is intended that such identified actions will lead to continuous improvement and in turn inform subsequent versions of the HIAMP.

This document will be subject to review should there be any revisions issued to the set of Codes of Practice published by the UK Roads Liaison Group or within at least 5 years of its inception.

01 - INTRODUCTION

Overview

Southwark is located in central London with its northern (and widest) part along the south bank of the River Thames. Southwark's geographical shape then gradually becomes thinner with its southern point near Crystal Palace. At its north western end and along the River Thames Southwark commences just west of Blackfriars Bridge. It continues as far east as Rotherhithe incorporating many famous landmarks such as Tower Bridge, HMS Belfast, Tate Modern and Shakespeare's Globe Theatre. Further south from the River Thames Southwark incorporates many well known locations such as Camberwell, Peckham and Dulwich.

Figure 1 - Map of Southwark

The Southwark Council highway network plays an important role in providing key links for travel within London and particularly to and from adjacent Boroughs. In addition Transport for London (TfL) and the neighbouring authorities also provide a key role for Southwark Council's highway network and considerable liaison, cooperation and coordination is needed across the various boundaries for the mutual benefit of networks in each Highway Authority.

The intention of this HIAMP is to set out the vision for improvements in the management, operation and funding of assets. The term 'highway', or 'highways' in this HIAMP for Southwark Council is the public rights of way (of various categories or classes) maintained at public expense by Southwark Council. Within the highway there is an array of important assets (or parts) making up the highway network. Each asset has a wide range of detailed descriptions or component parts usually described as attributes.

The Southwark Council highway network is maintained and managed by the Highways Division as stewards of the highway network. Formal agreements exist with neighbouring Authorities with respect to all boundary roads.

Purpose of the HIAMP

Nationally authorities continue to face significant and increasing challenges, foremost of which is inadequate budget provision. Highway budgets have therefore to compete for funds with other demanding services within any authority. Mature highway networks, such as that within Southwark, also have a considerable backlog of required maintenance, or renewal, which need additional funding. These challenges are further exacerbated by increasing public expectations.

It is in this context that a number of drivers have emerged encouraging authorities to adopt an asset management approach to managing highway networks. One such driver is the 'Highway Infrastructure Asset Management Guidance Document' published through the Highway Maintenance Efficiency Programme (HMEP).

An asset management approach allows for the development of a maintenance strategy based on best practice, life cycle methodologies and user needs. It also provides tangible evidence and substantiation for funding bids and decisions.

Asset management when applied to the highway network is a forward looking approach to planning, by managing investment over the whole life of the particular asset to try and ensure that value for money is obtained.

An example of the adoption of the asset management principles within the highway would be to ensure that the timely reconstruction or resurfacing of a carriageway is carried out. This would then ensure that repeated patching of its surface would not need to occur, ensuring a smoother surface, less traffic disruption and a lower whole life cost.

There are specific advantages in adopting asset management principles in managing the highway network as it enables:

- long term planning for budgetary purposes,
- long term planning for works,
- consistency and optimisation in levels of service - throughout the service,
- clear visibility with regard to actions taken,
- the monitoring of service and asset performances,
- a more efficient and cost effective highways service and stewardship of the highway network.

These advantages lead on to the following real benefits:

- more informed decision making with regard to the highways service,
- reduced whole life costing for all assets making up the highway network,
- customer focussed delivery for users of the highway network,
- transparency and ownership in decision making processes.

This HIAMP has been produced to formally endorse and adopt the asset management approach to the management of Southwark's highway network.

Budgets

Within Southwark there are three main sources of funding and corresponding expenditure for highway assets:

Council Capital funding is provided for the renewal of the asset and is planned to ensure that such works extends (or renews, or replaces) the life of the asset. Such capital schemes of work are planned in advanced and the justification for intervention (or works) generally arises from the outcome of condition inspections.

Revenue funding is for the day to day maintenance and operation of the assets. Such revenue intervention (or work) arises to ensure serviceability and safe use of the assets on a daily basis. Revenue funded work may be termed 'reactive' where it is related to rectifying defects meeting specific investigation criteria arising from a safety inspection. Revenue funded work is not pre-scheduled or predictable (e.g. patching a hole in the carriageway will generally be carried out at fairly short notice). In addition to 'reactive' work 'routine' revenue work arises from certain pre planning of what are essentially maintenance activities (for example the bulk changing of lamps in street lights, or cleaning of assets, etc).

Grant funding is used to supplement the above funding streams. Grant funding is awarded on application from a number of different sources. In March 2011 Southwark received a 'Winter Payment' from central government to help repair potholes on the local road network following the severe winter that was encountered at the end of 2010. More recently, in March 2014, the Department for Transport allocated additional funds, a 'Pothole Fund' to repair damage to the roads following the wettest winter on record. Additionally to this LoBEG (London Bridges Engineering Group), for example, offers funding each year on application for individual projects relating to structural works associated with bridges in London and TfL provides grant funding for the renewal of Principal Road assets.

With the introduction of an asset management approach full justification and associated information for the needed budgets for managing the highway network will in the future be an increasingly important aspect of the budgetary process. Details of the investment strategy are outlined in **06 - Investment Strategy**.

Organisational Context

This HIAMP is an operational document written and managed by the Highways Division, part of the Environment and Social Regeneration Department, with relevant input from the Traded Services division.

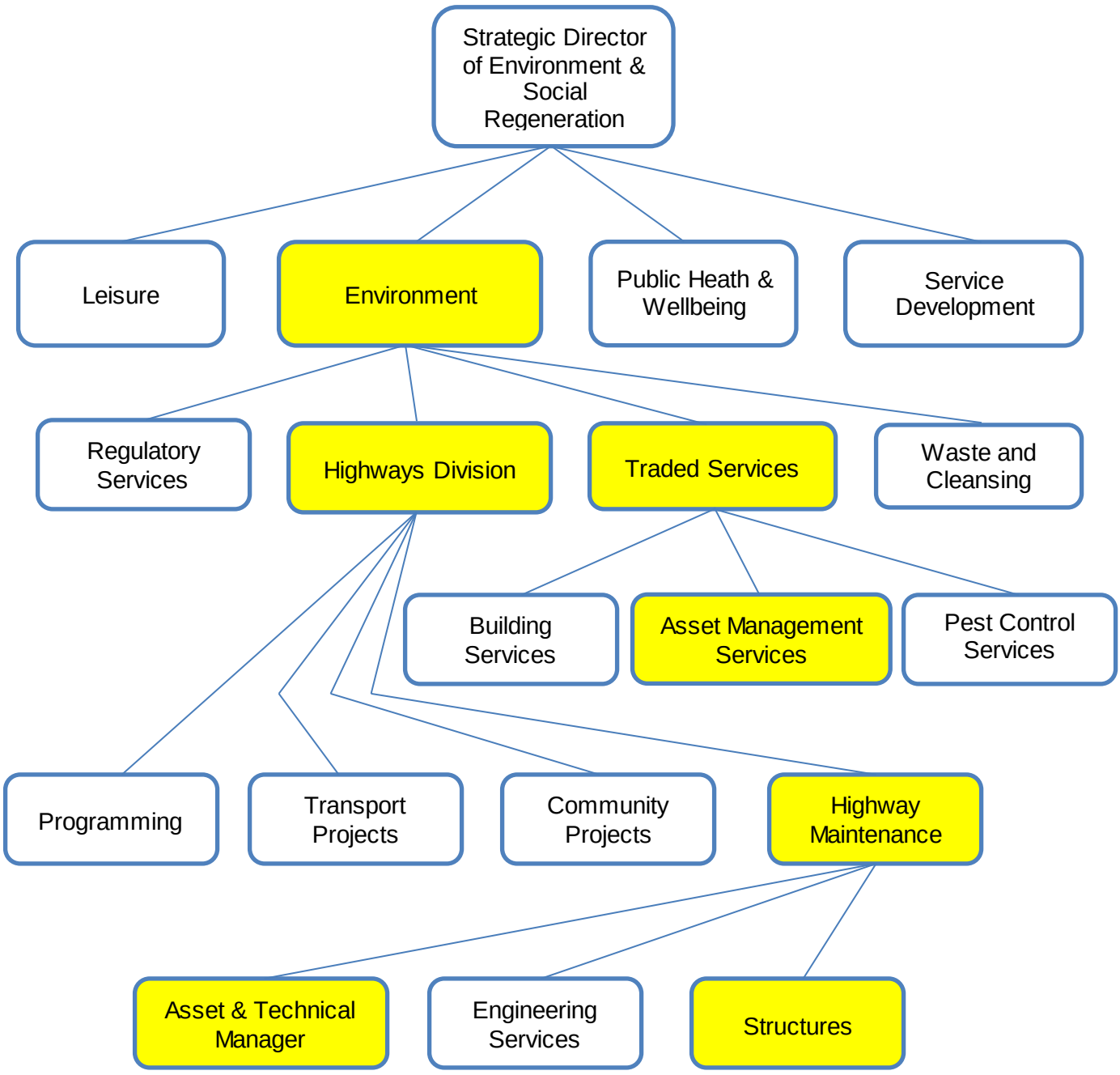


Figure 2 – Organisational diagram

The Highways division has been established to create a coherent management regime for the highway asset. The HIAMP is compiled and maintained by the Asset & Technical Manager within the Highway Maintenance team of the Highways Division.

02 - POLICY, STRATEGY AND LEVELS OF SERVICE

These are fully detailed in the HIAMP component document ‘Asset Management Policy, Strategy and Levels of Service’.

03 - PERFORMANCE MANAGEMENT

Levels of Service - Performance Indicators

There are a number of Performance Indicators (PI) that have been defined and which are reported upon, these comprise a mixture of established national and corporately set targets. The previously used national indicators allow comparisons with other highway authorities while also identifying trends. These are detailed in the **HIAMP Addendum Section 01 – Performance Management** and they are grouped according to the following criteria;

a) Accessibility of services.

b) Availability and accessibility of the highway network.

c) Safe highway or street environment.

d) Quality of the street scene.

e) Serviceability of highway assets.

f) Quality of highways service delivery.

Stakeholder Perceptions

Southwark participates in the National Highways and Transport survey (NHT) which is used to collect data nationally on public perceptions of, and satisfaction with, highways and transportation services. The survey asks the public which services they think are most important and how satisfied they are with delivery of those services. The main survey topics include (but are not limited to):-

- Highway Maintenance and management.
- Condition of roads and pavements.
- Rating roads and transport services.
- Pavements and Pedestrian facilities.
- Causes of congestion.

It allows comparison with other London boroughs and provides information on trends over time and a summary of the results can be found in **HIAMP Addendum 01 – Performance Management**.

To enable the comparison of performance indicators and levels of service Southwark are participating in the development of a London wide web based benchmarking programme. This development programme is led by the London Technical Advisors Group's (LoTAG), comprising members from Transport for London (TfL) and the London Boroughs.

04 - ASSET INFORMATION AND DATA

Scope of this HIAMP

This HIAMP includes the following assets:

- Carriageways.
- Footways.
- Street lights.
- Illuminated furniture (e.g. flashing beacons, bollards, signs, central columns).
- Highway structures (bridges, subways, pipe subways, retaining walls, river walls etc).
- Highway surface water drainage including gullies.
- Street furniture (e.g. signs, seats, bollards, road markings, on-street parking infrastructure including parking machines, etc).

The following activities and assets, although the responsibility of Southwark Council, are not included within the scope of this HIAMP:

- Street cleansing.
- Trees, verge maintenance and horticulture.
- Memorials (with the exception of those situated on the public highway).
- Private or unadopted roads or rights of way including council estate roads.
- Litter bins.
- Strategic directional signs.
- Closed Circuit Television apparatus, CCTV.
- Enforcement activities on the highway.

Approximately 55 kilometres (34 miles) of the Transport for London Road Network (TLRN), the Capital's network of main roads, most of which are red routes, passes through Southwark. This network does not form part of the Southwark Council HIAMP as the TLRN is the responsibility of TfL). Similarly traffic signals (including those for pedestrians) on the Southwark Council highway network (and across London) are the responsibility of TfL and therefore outside the scope of this HIAMP.

However, considerable liaison, cooperation and co-ordination is needed between TfL and Southwark Council for the mutual benefit of networks and assets that are the responsibility of each highway authority. A full summary of the TLRN can be found in Appendix 4.

To avoid any doubt the following are also excluded from the scope of this HIAMP:

- Bridges across the River Thames.
- Bus stop flags and shelters.
- Utility apparatus and the activities of statutory undertakers.

Existing Assets

The method in which Southwark records and stores asset information will be the key to an effective process, ideally the following criteria should be held on record:

- The extent and condition of the entire carriageway network.
- The extent and condition of the entire footway network.
- The extent and details of every component associated with the street lighting network.
- Individual condition of highway structures in the borough.
- Extent and condition of the Highway surface water drainage network
- Extents and details of every component associated with street furniture.
- Extents and details of every component associated with parking payment machines and other infrastructure.
- Details and commitments to winter servicing.

However, the current information that is held about assets does leave room for development. An Improvement Plan has been produced in 2011 partly from a Gap Analysis (see **09 - Performance Monitoring**); this has been reviewed at the inception of the HIAMP the results of which are included within the **HIAMP Addendum Section 01 – Performance Management**. This will be monitored and updated, through these actions there will be continuous improvement which in turn will be reported on in subsequent versions of the HIAMP.

Southwark holds all of its asset information within a database called *Confirm* which allows an integrated approach to the management of the assets. Like all data systems for it to be successful in its operation, sufficient resources and time have to be allocated to its development and management. A summary of the asset data can be found in **HIAMP Addendum Section 02 – Asset Information and Data**.

Carriageway and Footways

Asset Data

A database has been created to maintain a record of all the highways, which provides details of location, physical attributes and condition. The database is maintained in such a manner to provide:

- A consolidated and user friendly inventory of carriageways, giving details of the carriageways including location and physical attributes.
- A consolidated and user friendly inventory of footways.
- A historical record of carriageway and footway work undertaken on each road.

Monitoring the Condition

Safety Inspections

Pre-planned safety inspections are carried out at frequencies determined by road classification for both carriageways and footways which are fully detailed in the HIAMP component document 'Highway Policy Plan (HPP)'; which takes a risk based approach to managing the highway asset. This also contains details of the investigation levels (i.e. the level a defect reaches for repair work to be considered) and the corresponding response time for the defect repairs.

Condition Inspections

Specialist annual visual inspections (as defined within the United Kingdom Pavement Management System, UKPMS) are also carried out to determine the overall condition of the carriageway and footways. These inspections are carried out by external consultants for non-principal roads in Southwark; and by agents working for TfL for all principal roads throughout London, i.e. including principal roads where Southwark Council is the highway authority.

From these condition inspections some routine maintenance activities are determined and annual programmes of planned renewals of carriageways are also determined.

Data Strategy

All inspections and defects are recorded on handheld data capture devices allowing for a direct download to the *Confirm* Asset Management database. Similarly all repair works are recorded within *Confirm* together with the relevant completion date of the repair works.

Street Lighting

Asset Data

Within Southwark, the Lighting section have led the way in maintaining an up to date data system which manages all the relevant asset information.

In addition to these assets some 1,200 lights within parks and open spaces are repaired by Asset Management Services Business Unit but are considered outside the scope of this HIAMP.

Monitoring the Condition

All assets of illuminated furniture are subject to the following inspection regimes:

- Operational survey via night scout every 10 working days.
- Visual Inspection via highway inspectors.
- Technical inspection by a competent person at least once a year; this inspection is carried out at the same time as routine maintenance.

Data Strategy

All inspections and defects are recorded on the *Confirm* Asset Management database. Similarly all repair works are recorded within *Confirm* together with the relevant completion date of the repair works.

Highway Structures

Asset Data

A detailed inventory of all structures and component parts is retained within the BridgeStation database, which is a pan London database owned and managed by London Bridges Engineering Group (LoBEG).

Monitoring the Condition

Inspections

A rolling programme of Principal and General Inspections (PI and GI) has been set up for all highway structures in Southwark, which are fully detailed in the HIAMP component Highway Policy Plan (HPP). This is in line with national standards for the frequency and detailed extent of such inspections. The full results of such inspections are recorded in BridgeStation.

Other Inspections

Additional inspections or assessments are carried out in response to specific requests or needs which are also entered in the BridgeStation data base.

These may include:

a) Inspections arising before or after the passing of an abnormal load.

b) Inspections arising from bridge strengthening including technical approval procedures.

c) Inspections in connection with the monitoring of substandard structures.

Data Strategy

Data capture is based on a combination of visual assessments and testing, either in-situ or on extracted samples.

Highway Surface Water Drainage

Asset Data

Highway drainage assets are primarily road gullies and outlet pipes that are owned by the Council up to the point of connection to public sewers.

Monitoring the Condition

On-going annual inspection (at a minimum) and as per maintenance schedule.

A risk based approach has been adopted with improved and targeted maintenance of surface water drainage assets in Local Flood Risk Zones. The improved maintenance regime targets areas that are known and/or predicted to be susceptible to surface water flooding, as well as locations known to have a history of frequent blockage of highway drains. This approach ensures that resources are focused on more vulnerable areas of the borough in order to reduce the likelihood of flooding.

Data Strategy

A database of details about surface water drainage infrastructure is maintained. Information includes location, type and other asset attributes.

The Local Flood Risk Management Strategy emphasises the importance of collecting additional data through detailed flooding investigations and modelling assessments, detailed designs and consultations with local communities and stakeholders.

Street Furniture

Asset Data

Southwark holds inventory data for a number of items.

Monitoring the Condition

The inspection of street furniture is included within the inspections of carriageways and footways as detailed in the HIAMP component document 'Highway Policy Plan (HPP)'.

Additional inspections will be generated by emergency call outs (either during working hours or outside of normal working hours) when it is reported that an issue of safety with regard to the item of street furniture has been reported.

Data Strategy

All inspections and defects are recorded on the *Confirm* Asset Management data base system. Similarly all repair works are recorded within *Confirm* together with the relevant completion date of the repair works.

Winter Maintenance

Asset Data

The Council's Winter Service assets are 180 self-service salt bins located on the network, the salt storage facilities and a small number of pedestrian propelled footway gritters operated by the Street Cleansing team. The salt itself, and carriageway gritting vehicles are owned and operated by the term highways contractor that provides the winter service.

Monitoring the Condition

There are no formal inspections carried out for the winter service but reports of potentially hazardous situations are always visited and inspected. Similarly ad-hoc inspections are made of the highway network when particular weather forecasts predict that potentially hazardous situations may arise.

Throughout the winter period regular customised weather forecasts are provided so that appropriate action may be ordered as needed to mitigate against the risk of winter weather hazards.

Data Strategy

Data of salting operations from the GPS tracking system is recorded and also the weather forecasts issued throughout the winter period with resulting action plans are retained. The weather forecast contractor also produces a report about the prevailing weather conditions for the winter period.

Meter Maintenance

Asset Data

The assets included within the generic group of Meter Maintenance are mainly Pay and Display machines. The old 'lollipop' style parking meters are being phased out, however, there are still a small number in Southwark.

Monitoring the Condition

A visual inspection of every meter or machine is carried out on a regular basis. This service is carried out by the appointed Parking Enforcement Contractor.

Data Strategy

A data base of all meters is recorded on the *Confirm* Asset Management database system. Similarly all repair works are recorded within *Confirm* together with the relevant completion date of the repair works.

05 - LIFECYCLE PLANNING

Principles of Lifecycle Planning

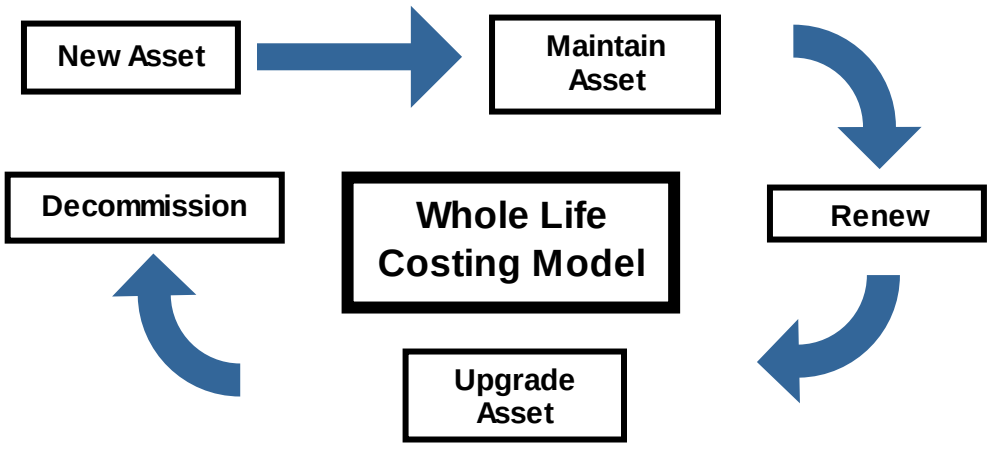
Gone are the days of programming asset maintenance and renewals on a needs must basis. To be able to offer a high level of services to its residents and users, Southwark must work towards a more integrated approach to asset management by taking a long term view of what is required to achieve the desired levels of service for all asset components. To achieve this outcome the life of the asset will be managed to maximise its serviceable life, through lifecycle planning.

This process identifies key stages in an asset's life and highlights all stages as possible points for different options of investment. The objective of this approach is to ensure that each component part of an asset achieves its full expected design life, therefore offering maximum value for money. This principle of minimum whole life costing is at the heart of good asset management.

In simple terms, investing in routine maintenance and replacement of certain aspects of an asset will help prolong the service life span way beyond its original design life.

The process which identifies specific stages for potential investment intervention is called the Whole Life Costing model and the diagram below shows the key intervention stages:

Figure 3 – Whole Life Costing Model



Each of the individual intervention stages have been outlined in Table 1 detailing the types of activities which may arise in each scenario.

Table 1 – Whole Life Costing Stages

Whole Life Stage	Description
New Asset	A new asset would be described as one that may have been adopted as a package of newly completed highways work, installation of a new lighting column, park bench or simply the erection of a new road sign.
Maintain Asset	At this stage routine maintenance would be undertaken to meet or attain the correct level of service.
Renew or replace Asset	Investment in work which may be carried out to return the asset back to its 'as new' condition or capacity to maximise the asset's design life. This may also mean renewing the entire asset or simply renewing key components when routine maintenance alone will not singly sustain the assets service level.
Upgrade	The asset or its specific components could be upgraded above its original standard to meet future needs or capacity.
Decommission	When an asset has reached the end of its design life it is either demolished or decommissioned. Carriageways and footways are rarely decommissioned, however individual components maybe decommissioned and replaced.

The key stages above outline the staged investment approach required to achieve and maximise an assets serviceable life cycle under the Whole Life Costing model. This model will be followed closely through the HIAMP Improvement Plan (see in **HIAMP Addendum Section 07 – Improvement Plan**).

Asset Lifecycle Planning

Carriageway and Footways

Approach Adopted

Historically, the capital funded highway maintenance programme for carriageways and footways has been based on a 'worst first' approach with additional patching works in targeted areas. However, from 2013 the overarching aim has been to allocate capital funding based on whole life costing, but to do this there has been a transition period moving from a 'worst first' methodology to a fully-fledged asset management approach.

The first stage in the development of this approach was commenced in 2013/14, through the use of software (*Horizons*) which was specifically purchased for this purpose. *Horizons* is a web based mapping application which allows Highway Engineers to visualise, manage and optimise asset management strategies. The software package is based on a combination of Graphical Interface Systems (GIS), Pavement Management and Asset Management systems.

It provides the facility to view and assess the condition of the highway assets, assess maintenance and replacement requirements, and provide a programme for structural repairs based on whole life principles. The software identifies and prioritises highway maintenance schemes, and determines the cost implications of various treatments.

Whilst condition is the primary driver when determining a programme of remedial works, local authorities have to take account of local factors when managing the local highway network. The local agenda needs to be met, coupled with stakeholder requirements and issues relating to road safety. There is therefore a need to quantify external factors so that local priorities can be incorporated into the development of any renewal programmes. The following local priorities have been developed and are held as GIS layers in *Horizons* and included within the whole life costing process:

- Bus Routes
- Cycle Routes
- Category 1 reactive repair works.

Treatments

The *Horizons* system allows Southwark to define locally relevant remedial treatments, which are then used within *Horizons* to develop and progress lifecycle planning. The following Treatments have been utilised in *Horizons*;

<u>Road/Carriageway Maintenance</u>

- Road Renewal (or rebuilding)

  The full depth replacement of the structure of the road.

- Road Structural Surfacing

  Overlay (the laying of a new layer on the top surface to strengthen the road) or replacement of part of the structure of the road by replacing two construction layers. These techniques are used to improve the structural strength of the road and prolongs its life.

- Road Thin surfacing

  Replacement of the top surface of the road to improve the surface condition.

- Local Patching

  Localised patching repairs to the surface by replacing up to two construction layers to improve the structural condition.

Footway Maintenance

- Renewal (or rebuilding)
  The full depth replacement of the whole structure of the footway.
- Resurfacing/Reflagging
  The replacement of only the blacktop surface, paving slabs or brick paviours.
- Local Patching
  Localised patching repairs to the surface by replacing up to two construction layers to improve the structural condition.

Typical costs of individual treatments can be found in **HIAMP Addendum Section 03 – Lifecycle Planning**.

Local Weightings

Bus and cycle route information has been provided to develop weighting factors that can be applied to the condition data. These weighting factors effectively help to prioritise remedial works based upon the level of bus traffic (and hence need for structural works) or cycle usage (with concerns relating to safety and the carriageway 'edge' where most cyclists travel).

The weighting factor for bus routes is determined by the number of routes using each road, whilst for the cycle routes a simple weighting is applied based upon the presence of a cycle route along particular streets.

The weighting factors are summarised in **HIAMP Addendum Section 03 – Lifecycle Planning**. As the process is developed other factors (such as the level of public complaints, utility programmes) will be considered for incorporation into *Horizons* to inform the programming of remedial works.

Treatment Strategy

A number of strategies are applied using *Horizons*:

- 'Asset Sweating' which delays remedial works where possible without putting the service or highway users at risk. This is used to provide the optimal combination of treatments within existing budgets.
- Incorporate Performance Indicator targets to derive a programme that will lead to demonstrable improvements in terms of national reporting.

The *Horizons* system allows Southwark to use the locally defined remedial treatments, and specify additional criteria and triggers at which these treatments would be invoked. It also allows local condition bands to be developed to give greater scope for lifecycle planning.

This approach provides more meaningful output than simply relating data to a 'score' and allows Southwark to focus upon specific defects and treatments. *Horizons* also enables treatment effects to be defined so that when planning future treatment and funding requirements the time when further intervention is likely to be required can be estimated.

Street Lighting

All roads are placed into a hierarchy worst Category One through to best Category Four and a budget cut off is applied. This determines the roads to be submitted for delivery for the future capital programme. The adopted selection process is illustrated in full in the **HIAMP Addendum Section 03 – Lifecycle Planning.**

06 - INVESTMENT STRATEGIES

Levels of Investment

Annual condition inspections and objective assessments are critical to any forward planning and selection process. Use of annual condition inspections serves to inform on the asset selection and replacement process and determine trends about conditions over time. If conditions are:

a) improving over time then investment levels are sufficient - providing the prioritisation process is in place,

b) deteriorating over time then investment levels are insufficient - providing the prioritisation process is in place.

Lifecycle plans are being developed for highway assets which will detail the different options to be evaluated and ultimately selected. This involves the development of a long term programme for the infrastructure service areas, linked to achieve the anticipated and intended level of service while taking into account the availability of financial support.

Carriageways and Footways

Investment Programmes

The following capital investment programmes are undertaken in Southwark;

- Principal roads (A class roads where Southwark Council is the Highway Authority) robust bids are prepared for funding of planned maintenance (or renewal) works. These bids are then presented to TfL and depending upon their assessment of the bids, funding of the proposed works is considered along with bids from other London Boroughs. The Southwark Council network in this category is only a short length and such funding is generally small in the region of £0.5m. However, in 2013 a three year investment programme from 2015/16 onwards was agreed whereby an additional £1m of the council's own capital would be invested by Southwark to improve the condition of this vital asset.
- Non-principal roads (B, C and unclassified roads and footways) in Southwark the initial capital strategy has been determined up to 2022/23, this can be found in **HIAMP Addendum Section 04 – Investment Strategy**.

Prevention Better Than Cure

A Pothole Review report published in April 2012 by HMEP on Prevention Better than Cure emphasised that;

"*local highway authorities should adopt the principle that 'prevention is better than cure' in determining the balance between structural, preventative and reactive maintenance activities in order to improve the resilience of the highway network and minimise the occurrence of potholes in the future*".

Annual visual inspections of carriageways and footways are undertaken throughout the borough to determine the condition of these assets. This data is being used to direct resources where they will be the most effective by maximising the assets restored to a 'Good Condition'. This strategy is based on the premise that it is far more cost effective to treat assets in a 'Poor Condition' thereby preventing them from deteriorating to a much worse 'In Need of Repair' condition, than it is to only direct resources to treating assets 'In Need of Repair'. This should over the longer term result in an improvement in stakeholder perception of asset maintenance.

The following figure illustrates the increase in maintenance costs as the condition of the road or pavement asset deteriorates. However, reactive and preventative costs will vary depending upon the asset so the diagram is only illustrative, though it does bear out the premise that 'prevention is better than cure'.

Figure 4 – Illustration of Maintenance Costs by Asset Condition (Illustrative - not to scale)

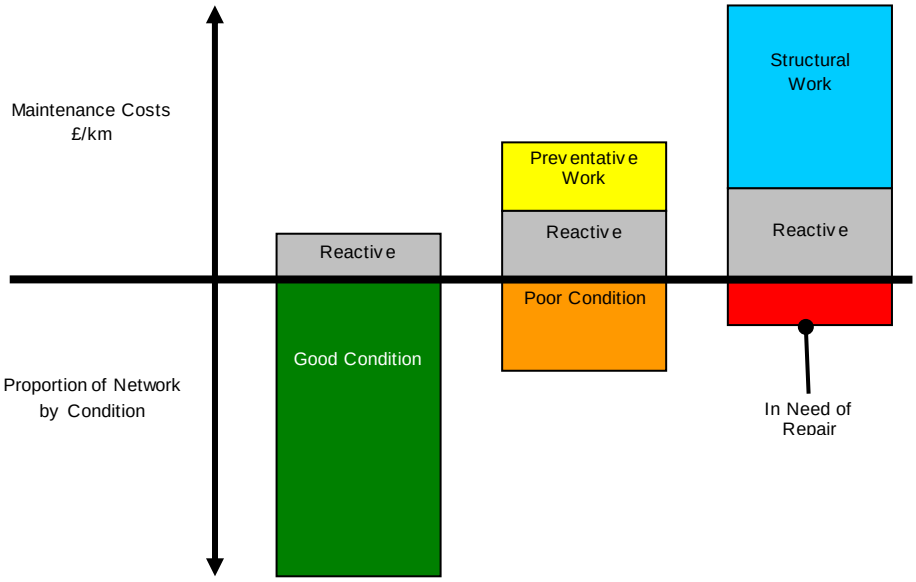


Table 2 further illustrates the potential cost savings than can be to be achieved by applying a Preventative Better than Cure strategy to various assets;

Table 2 – Preventative and Cure Costs

Asset Type	Preventative Maintenance (Treating Asset in a 'Poor Condition')	Cure Maintenance (Treating Asset in a 'In Need of Repair')	Cost Factor of Cure against Preventative Treatment
A, B & C Roads	£13 per m^2	£87 per m^2	6.7 times greater
U Roads	£11 per m^2	£58 per m^2	5.2 times greater
Footways	£33 per m^2	£78 per m^2	2.4 times greater

Notes:
Costs are based on the current Highways and Professional Services Contract (HAPS) at 2016/17 rates.

Investment strategies based on Prevention Better than Cure have been developed, and will be evolved and refined to ensure that the asset management approach successfully maximises the potential benefits. The following strategies have been developed;

- a re-balancing of the capital budgets to ensure that investment is targeted effectively and where it is most needed,
- the potential benefits of providing additional capital resources to each component of the highway asset,
- apply the strategies to principal road network to ensure that capital funding is being used effectively,
- review the spend profile of the agreed capital investment programme and identify the potential benefits of bringing forward proposed investment.

For an asset management approach to be successful the strategies cannot be prescriptive, they must be flexible, this will ensure that Southwark makes the decisions necessary to achieve the public's expectations (see **HIAMP Addendum Section 04 – Investment Strategy** for a detailed outline of the proposals).

Street Lighting

The capital renewal programme has seen the removal and replacement of approximately 8,000 street lighting columns and their lighting units over the last 10 years. A Capital Budget of approximately £0.5m million has been agreed, the initial five year budget strategy can be found in **HIAMP Addendum Section 04 – Investment Strategy**.

Structural Integrity & Energy Efficiency

Replacement priorities were originally based on the structural integrity of the street lighting column, with the replacement of columns that were structurally deficient given a top priority. This was due to the perceived risk of failure of such columns as it is not feasible to carry out structural tests. However, all lamp columns identified as being structurally deficient have now been replaced. Greater consideration is now being given to energy and carbon reduction due to the continuing rise in energy costs (see **05 - Lifecycle Planning**).

The on-going programme of non-destructive structural testing is used to identify and inform the priority selection of the future replacement programme, by the upgrading or replacing of items with inefficient and or high energy consumption controls.

All newly installed street lights since 2002 have consisted of the latest available technology ensuring that they are energy efficient, fit for purpose and minimising whole life costs.

There is not such a robust programme of renewing other illuminated street furniture (illuminated signs, bollards etc) due to the lack of a replacement capital budget. Replacement programmes are funded through the existing revenue budgets and external capital investment. However, in some instances, with the use of innovative technology some sign lighting units and beacons are being replaced with LED (light emitting diode) units. Similarly some bollards are being replaced with solar powered units.

Highway Structures

There is a transparent process for allocating available funding for investment in London's bridges through the London Bridges Engineering Group (LoBEG) using data within the BridgeStation asset management system. LoBEG provide funding each year upon application for individual projects relating to structural works associated with bridges in London. The prioritisation process used to provide funding is based on a risk assessment methodology that takes account of assessed capacity, route supported, obstacle crossed, interim measures and the consequences of restrictions or closures.

Whilst it is possible to demonstrate a need for investment on an individual structure basis, currently there is not a formal summary of assets setting out condition and investment requirement.

Highway Surface Water Drainage

Southwark is developing a holistic approach to the management of highways surface water infrastructure through the Local Flood Risk Management Strategy. Currently highway surface water drainage is only repaired, replaced or improved by way of reactive works or as a result of specific capital investment arising from adjacent capital carriageway, footway or project works.

In relation to drainage, a need from surface water management studies for large scale capital investment has been identified. Further work by the authority in line with the Surface Water Management Act will identify infrastructure and subsequent investment needs.

Street Furniture

Items of street furniture are repaired, replaced or removed only by way of reactive works or as a result of specific capital investment arising from project-based capital investment.

Street Furniture condition assessments have not been carried out. This has resulted in the inability to identify areas of need and investment requirements.

There is currently no forward plan or planned investment for the replacement of existing street furniture items.

Winter Maintenance

Prior to each winter period a component document to the HIAMP is produced, the Winter Maintenance Policy and Service Plan (WMPSP), that sets out the winter maintenance procedures and policies. The WMPSP is developed based on the following approach:

- A review on the effectiveness of the previous winter operations and where appropriate the introduction of improvements into the current year's Winter Maintenance Policy and Service Plan.
- Due consideration of the lessons learnt from reviews undertaken by Southwark following the 2010/11 and 2011/12 severe winter periods.
- Reference made to documents produced to help enhance London's resilience in severe winter weather including *'Keep London Moving Through Severe Winter Weather'* published by the Gritting Panel Review Team and the *'Practical steps for London Highway Authorities'* a supplementary document drafted by the London Winter Service Review Steering Group. Guidance issued by the National Winter Service Research Group (NWSRG) is also taken into consideration in producing the WMPSP.
- Establishing and maintaining salt stock levels including usage reporting procedures.

- Reviewing treatment routes for carriageways and footways based on the network established in previous winter operations and additional vulnerable locations.
- Setting in place weather prediction service arrangements whereby forecasts are provided during the standby period with increased frequencies during severe weather periods.
- Operational arrangements including the roles of various service areas, prescribed scenarios for intervention levels; carriageway and footway treatment and communications.
- Stand by and out of hours procedures.

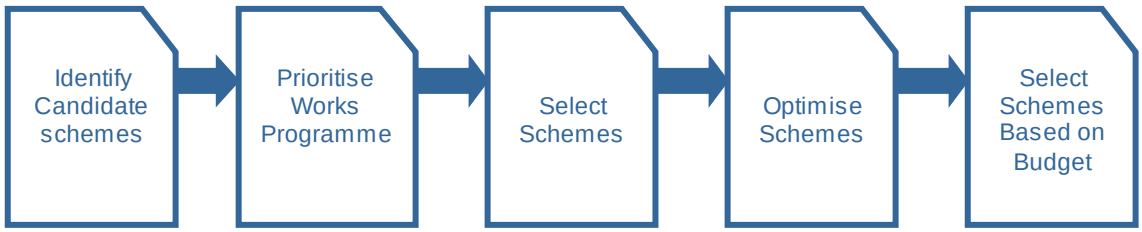
07 - WORK PROGRAMMING

Development of Work Programming

The development of works programmes for asset maintenance comprises the identification, prioritisation, optimisation, programming and delivery of individual schemes. It takes into account the annual budgets that have been developed by the authority, supported by the lifecycle planning process described in **05 - Lifecycle Planning**.

The process for identifying candidate schemes and developing a programme of works is summarised in Figure 5 below;

Figure 5 - Developing a Works Programme



Candidate schemes in the initial works programme are prioritised taking into consideration selected treatment options developed for lifecycle plans (see **05 – Lifecycle Planning**) to identify those maintenance works requiring the most immediate action. A list of future schemes is also identified to ensure effective planning and preparation.

The following are taken into consideration when looking at those assets most in need of maintenance:

- critical to ensuring safety,
- carry a high level of risk, such as highly trafficked principal roads,
- have keen stakeholder interest; and
- support the corporate vision.

Where there is insufficient budget to deal with all the needs then schemes which are safety critical or have a high level of risk carry the highest priority. Candidate schemes are prioritised to ensure that those that provide the greatest contribution to the asset management strategy at the minimum cost are undertaken. Adopting this approach ensures that value for money is achieved.

Before candidate schemes can be prioritised, priced options for maintenance are identified using the selected treatment options developed for lifecycle plans.

The Forward Programme

Initial forward programmes are developed comprising of schemes for each asset planned to be carried out within the next three years which support the financial planning detailed in **HIAMP Addendum 04 – Investment Strategy**.

The forward programmes are subject to annual review and updated using the latest sources of data and reported to the Cabinet Member annually, demonstrating what, where and when schemes are to be undertaken. The Cabinet Member reports also identify how the forward programme will meet the requirements of the asset management strategy. The published forward programme can be found in **HIAMP Addendum 05 – Work Programming**.

08 - OVERALL RISK IMPLICATIONS OF THE PLAN

The Southwark Council highway network is used daily, either directly or indirectly, by every resident in Southwark along with a considerable number of travellers passing through the Borough. It has a wide array of asset items, each of which suffers continual use and sometimes abuse. Keeping each item in a safe and serviceable condition at all times represents a considerable challenge and in an increasingly litigious society this represents a considerable risk which needs to be managed.

Risk identification

In order to manage the risks involved it is important to firstly identify the source of the risks:

- Safety – in relation to both highway users and those involved in delivering the service.
- Natural events – predominantly the weather and associated effects.
- Physical risks – resulting from the failure of the asset.
- External – resulting from an array of factors but including legislative and economic factors (e.g. Changes in government policy, oil price changes, inflation etc.).
- Internal and corporate – Reliance on key personnel and systems.

It is rarely possible to completely eliminate risk; therefore risk management is used to reduce the exposure of an organisation to risks. Following the identification of risks it is then possible to undertake a risk analysis and risk reduction.

Risk Analysis

Risk analysis is the determination of those events most critical to disrupting the requisite level of service, considerations likely to be included are:

- Injury or loss of life.
- Failure to meet statutory requirements or reduction in service.
- Loss of revenue or costs of repair.
- Third party losses.

In determining the probability or likelihood of an event occurring this will often be based on experience or availability of relevant data including:

- Accident statistics.
- Number of claims.
- Trends and geography data.

Following the consideration of impact and likelihood of risks occurring in a risk matrix the most critical risks are then prioritised.

Risk Reduction

Actions that can be deployed to reduce risk or its impact are:

- Capital expenditure to reduce the probability of failure, e.g. timely replacement of lamp columns and structures.
- Revenue expenditure to reduce the probability of failure, e.g. patching (or making safe) of minor defects.
- Reducing the impact of a failure by the production of appropriate contingency plans.
- Insuring against the consequential loss.
- A combination of the above actions.

An alternative action is to accept the particular risk and any consequential costs met should the failure event occur.

Risk Register

A Risk Register containing the significant risks and the management of those risks to implementing good asset principles with regard to Southwark Council's highway network has been developed and is contained in **HIAMP Addendum Section 06 – Risk Register**.

Monitoring and Review

For asset management to be effective it is necessary to monitor and review the identification of critical assets, assess the risks of failure and document courses of action to mitigate those risks as part of routine tasks. The measures of Risk Management are;

- Highway Inspections, Electrical Testing, Insurance Liability and Settlements.
- Flood mapping and Critical Drainage Areas.
- Highway Structures Principal and General Inspections.
- Street Lighting Structural Testing.
- Highways Condition Assessment.

09 - PERFORMANCE MONITORING

Improvement Plan

One of the main purposes of compiling this HIAMP is to develop processes and central to this is an improvement plan, which sets out a series of actions to fully develop and adopt an asset management approach for the highway network.

The initial Improvement Plan identified performance gaps the borough can either bridge or improve on, to ensure the assets are maintained to the highest level and keep life cycle costing to a minimum. Essentially there are two categories of such performance gaps;

a) Highway assets - where the condition of an asset is below the desired level to preserve the value and integrity of the asset, e.g. where the carriageway has deteriorated to such an extent that major capital investment works are needed to restore conditions.

b) Services - where the demand aspirations are not being met, or the Level of Service provided to highway network users is not meeting the desired level, e.g. where the visual appearance of the street scene is poor.

Having undertaken an in-depth Gap Analysis exercise a 'desired state' for our assets was identified along with service levels, calling upon good practice and national guidance, as well as on local priorities and policies in order to identify gaps in our asset management processes.

Improvement actions are identified to address these gaps, assign priorities to these actions, and draw up the highways asset management improvement plan contained in **HIAMP Addendum Section 07 – Improvement Plan**. The improvement programme will be reviewed and updated annually.

APPENDIX 1 - GLOSSARY OF TERMS AND ABBREVIATIONS

Glossary of Terms

Asset Management
This is a strategic approach which identifies the optimal allocation of resources for the management, operation, preservation and enhancement of the highway infrastructure to meet the needs of current and future customers.

Customer Focus
This is the explicit consideration of customer expectations.

Levels of Service
This is a statement of the performance of the asset in terms that the customer can understand. Levels of service typically cover condition, availability, capacity, amenity, safety, environmental impact and social equity. They cover the condition of the asset and non-condition related demand aspirations, i.e. a representation of how the asset is performing in terms of both delivering a service to customers and maintaining its physical integrity at an appropriate level.

Optimisation
Maximising the benefits by balancing competing demands.

Resource allocation
The allocation of resources based on assessed needs.

Risk Management
This is the formal assessment of risks with the potential to affect delivery of the service via a process of identification, assessment, ranking and control planning.

Service Options
Options available for an asset or groups of asset in terms of alternative levels of service calculated as the Gross Replacement Cost minus accumulated depreciation and impairment.

Strategic Approach
A systematic process that takes a long term view.

Whole of Life
This is the whole life cycle of an asset under consideration.

Abbreviations

AIS	Asset Information Strategy
BPM	Business Process Maps
BU	Business Unit
CSS	County Surveyors Society
CVI	Course Visual Inspection
DfT	Department for Transport
DVI	Detailed Visual Inspection
GI	General Inspection (Structures)
GIS	Geographic Information System
GLA	Greater London Authority
HAMFIG	Highways Asset Management Financial Group
HIAMP	Highway Infrastructure Asset Management Plan
HMEP	Highway Maintenance Efficiency Programme
HPP	Highway Policy Plan
KPI	Key Performance Indicator
ITS	Intelligent Transport System
LoS	Level of Service
NHT	National Highways & Transport Survey
NI	National Indicator (began April 2008)
LTP	Local Transport Plan
LoBEG	London Bridges Engineering Group
LoTAG	London Technical Advisors Group
PI	Principal Inspection (Structures)
SCANNER	Surface Condition Assessment of the National Network of Roads
SCRIM	Sideway-force Coefficient Routine Investigation Machine
TfL	Transport for London
UKPMS	United Kingdom Pavement Management System

APPENDIX 2 - LEGISLATION AND GUIDANCE

The following list is not an exhaustive list of legislation (covering highways, environmental and general legislation) as well as best practice guidance controlling the management of highways. However it contains principal examples of the main controls and influences under which the Highways Service operates and which therefore impacts on the HIAMP.

Legislation:

- The Highways Act 1980 – main legislation governing the strategic operation and management of highway assets.
- The New Roads and Street Works Act 1991 – governs the activities of statutory undertakers (utilities) when working on the highway.
- The Traffic Management Act 2004 – imposes a duty (the network management duty) to keep all types of traffic moving and is important in minimising disruption when planning highway maintenance works.
- The Health and Safety at Work Act 1974.
- The Management of Health and Safety at Work Regulations 1972.
- Construction (Design and Management) Regulations 2015.
- The Equality Act 2010.
- The Environmental Protection Act 1990.
- The Flood and Surface Water Management Act 2010.

Guidance:

- Maintaining a Vital Asset, 2005 produced by the Department for Transport, DfT via the UK Road Liaison Group (UKRLG).
- Well-managed Highway Infrastructure: Code of Practice for Highways Maintenance Management, 2016 produced by the Department for Transport, DfT via UKRLG. Suite of documents including an overarching introduction and separate daughter documents for highways, lighting and structures (superceding Well Maintained Highways, Well-lit Highways and Management of Highway Structures).
- Building on Strong Foundations - A Framework for Local Authority Asset Management, February 2008, produced by the Department for Communities and Local Government.
- Local Authority Asset Management Best Practice Guides produced by the Royal Institution of Chartered Surveyors, RICS, 2009.

- Prevention and a Better Cure, Pothole Review published by the Department for Transport as part of the Highway Maintenance Efficiency Programme in April 2012.

- Lifecycle Planning Toolkit incorporating Default Carriageway Deterioration Models published by the Department for Transport as part of the Highway Maintenance Efficiency Programme in November 2012.

- Highway Infrastructure Asset Management Guidance Document published by the Department for Transport as part of the Highway Maintenance Efficiency Programme in May 2013.

- Well Managed Highway Infrastructure: A Code of Practice, published by the UK Roads Liaison Group and the Department of Transport in October 2016.

In addition the following documents from the Greater London Assembly (GLA) and Transport for London (TfL) have an important influence on the HIAMP for Southwark Council:

- GLA - Way to Go, November 2008.
- GLA - Transport Strategy Statement of Intent, May 2009.
- GLA - Cycle safety Action Plan, March 2010.
- GLA - Mayor's Transport Strategy, May 2010.
- GLA - Cycling Revolution London, May 2010.
- GLA - Mayor's Vision for Cycling, March 2013.
- TfL - Asset Management Strategy, May 2014.
- TfL - Asset Management Policy, May 2014.
- TfL - Safe Streets for London – London's Road Safety Plan, published 2013.

APPENDIX 3 - SOUTHWARK COUNCIL POLICY DOCUMENTS

The following is a list of Southwark Council policy documents that have some influence or significance with regard to the HIAMP for Southwark Council:

- The Southwark Council Plan 2014/15 to 2017/18, giving Council priorities.
- The Southwark Council Borough Generic Emergency Plan February 2012, giving the outline procedure for dealing with major emergencies in Southwark.
- Southwark 2016: Sustainable Community Strategy (SCS).
- The Environmental and Leisure Directorate Business Plan giving Directorate Priorities and developing the Council Themes.
- Asset Management Plan 2011.
- Highway Division's:
  - Business Plan, giving an overview of Service Priorities.
  - Southwark Tree Management Strategy, 2013.
  - Southwark Streetscape Design Manual.
  - Winter Maintenance Policy and Service Plan 2016/17.
  - Asset Management Services Exterior Lighting Policy.
- The current Highways and Professional Services Contract (HAPS) for Delivery of Highway Maintenance and Projects, (including the Works Specification and Schedule of Rates).
- Southwark Transport Plan, 2011.
- Sustainable Transport supplementary planning document, 2010.

APPENDIX 4 - TRANSPORT FOR LONDON (TfL)

Transport for London (TfL) is the integrated body responsible for London's transport system and a functional body of the Greater London Authority (GLA). One of TfL's roles is to serve as the highway authority for the Transport for London Road Network (TLRN), the Capital's network of main roads.

These 580km constitute about five per cent of the total length of London's roads. Most are key bus routes, most are red routes and all are important thoroughfares for pedestrians, cyclists and freight.

Street fault reporting

Anything from potholes and faulty traffic lights to abandoned vehicles and damaged or missing signs can be reported through the TfL website using their Report IT facility (http://www.tfl.gov.uk/info-for/urban-planning-and-construction/roadworks-and-street-faults?intcmp=3514). A fault previously logged can also be checked using the Report IT web facility.

Red Routes

TfL Street Management manages red routes in London, and the London boroughs look after the other streets in our respective areas. Where a fault is reported on a red route that is TfL's responsibility, the work will be prioritised depending on how urgent it is. If the fault is on another road, the organisation responsible will be notified.

Blackfriars Road	Bricklayers Arms Roundabout	Bricklayers Subway (GLA)
Duke Street Hill	Elephant & Castle No.1 Northern	Elephant & Castle
Great Dover Street	Jamaica Road	Jamaica Road Subway (GLA)
Kennington Park Road	London Road	New Kent Road
Newington Butts	Old Kent Road	Peckham High Street
Queens Road	Southwark Street	St Georges Circus
St Georges Road	St Thomas Street	Stamford Street
Thurlow Park Road	Tower Bridge Road	Tunnel Approach
Westminster Bridge Road		

Further information can be found at http://www.tfl.gov.uk/corporate/useful-contacts/report-roadworks-or-streetfaults.