HIGHWAY SERVICES

HIGHWAY ASSET MANAGEMENT PLAN

for

CARIAGEWAYS & FOOTWAYS

2022/23 to 2026/27

HILLINGDON
LONDON

www.hillingdon.gov.uk

Foreword



As Cabinet Member for Community and Environment, I am pleased to introduce Hillingdon's Highways Asset Management Plan. Our highway assets are among the Council's most important and visible assets. They connect residents to work, education, health care, shops, green spaces and community life, and they support local businesses, public transport and essential services across the borough.

Hillingdon is a large and diverse borough, with busy town centres, residential neighbourhoods, rural lanes, strategic transport routes and links to Heathrow Airport and the wider London network. Managing this network well is therefore fundamental to our commitment to **putting residents first**: keeping the highway safe and accessible, making best use of public money, and planning maintenance to protect services for both current and future generations.

This plan sets out a proactive, evidence-led approach to maintaining our highway assets. By using condition data, engineering judgement, whole-life cost principles and local intelligence, we can identify the right treatment at the right time, extend asset life, reduce avoidable deterioration and ease pressure on reactive maintenance budgets.

We are also determined that highway maintenance supports our wider environmental ambitions. Through recycling, lower-carbon materials, sustainable drainage, innovation and improved resilience to extreme weather, this plan recognises that a well-managed highway network must also be a sustainable one.

There are real challenges ahead. Rising construction costs, traffic growth, utility works, climate change and the age of the network all place increasing pressure on the Council's resources. This plan is honest about those pressures but is also clear about our response: better data, transparent prioritisation, stronger forward planning and a clear focus on delivering the greatest benefit for residents, businesses and road users.

I would like to thank the Council's officers, contractors and partners who help maintain Hillingdon's highway network every day, and the residents who continue to share feedback about the places where they live, work and travel. This Highways Asset Management Plan provides a clear framework for making informed, responsible and sustainable decisions, and for continuing to improve the borough's highways in line with our commitment to putting residents first.

Councillor Wayne Bridges
Cabinet Member for Community & Environment

Revision History

Version	Date	Description	Prepared	Reviewed	Approved
1.0	04.09.2026	First Draft	NA	GSM	Cll WB

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Acronyms and Abbreviations

Abbreviation	Definition
AEI	Annual Engineer's Inspections
AI	Artificial Intelligence
CIPFA	Chartered Institute of Public Finance and Accountancy
CW	Carriageway
DfT	Department for Transport
FW	Footway
HAMP	Highways Asset Management Plan
HM Treasury	His Majesty's Treasury
OHBM	O'Hara Brothers Material
PAS 2161	Road condition monitoring standard

PROW	Public Rights of Way
SuDS	Sustainable Drainage Systems
TfL	Transport for London
UKPMS	UK Pavement Management System
WGA	Whole of Government Accounts
WMA	Warm Mix Asphalt

Part A: Asset Management Principles

Executive Summary

Hillingdon's Highway Assets

The highway infrastructure asset is the most visible, well-used and valuable physical asset owned by the Council. The funding for the management of this asset is under continuous scrutiny, with increasing pressure from government and the public for transparency, accountability and more efficient use of the limited resources available.

Hillingdon Council is responsible for:

715km carriageways (roads)

79km cycleways (segregated)

30,000 drainage gullies

1215km footways (pavements)

24,000 street lighting columns

194 highway structures

The value of this asset is estimated at just over £2.2bn.

Current capital funding levels allow approximately 11 kilometres of carriageways to be resurfaced and a further 9 kilometres of footway repaved every year. This means on average we can expect roads to be resurfaced approximately every 50 years and footways every 134 years – this compares to a typical asset design life of 30 years for a carriageway and under 60 years for a footway.

Currently the condition of Hillingdon's roads and footways is:

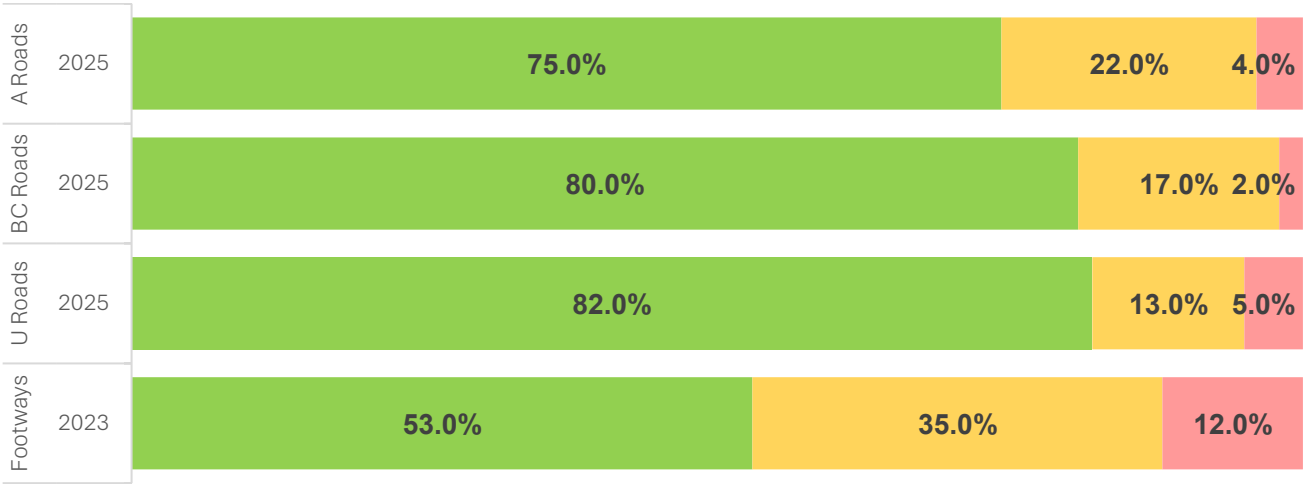


Figure 1: Condition of our carriageways and footways

Roads and pavements wear down over time for several reasons, such as fatigue, water ingress or oxidisation. Regular maintenance helps slow this deterioration and keeps the network safe, reliable and usable for residents, businesses and visitors.

The Council manages its highway network within the funding available. This means we cannot repair every road or pavement at once, but we will ensure investment is targeted where it will provide the greatest benefit for road users and the wider community.

Major pressures and challenges

Making the right maintenance decisions is essential to achieving the best value for residents and road users. In some cases, a road may be in such poor condition that major resurfacing or reconstruction is needed. In other cases, earlier and lower-cost maintenance can help extend the life of the road before more significant work is required.

In a climate where budgets and resources are reducing, Hillingdon is facing significant challenges in managing its assets effectively, including:

- Maintaining an ageing network that requires significant investment to remain safe and serviceable, rather than building modern roads, designed up to standards;
- Managing the impact of traffic growth, including the effect of heavier vehicles such as electric buses and heavy goods vehicles, that often far exceed what roads were originally designed for. Deterioration is concentrated on Hillingdon's busiest routes, requiring increased levels of intervention to keep safe and serviceable;
- Delivering statutory requirements, meeting stakeholder expectations and maintaining the engineering integrity of the network under increasing scrutiny, transparency, accountability and media exposure;
- Third-party works and climate change are rapidly accelerating network deterioration, with a high number of utility openings and heavy goods loads reducing longevity of assets. More frequent extreme weather events (heavy rainfall, heatwaves) also exceed original design considerations, which further deteriorate the assets;
- Improving accessibility and availability of the highway network and increasing reliability of journey times to create a more efficient and inclusive system;
- Maintenance budgets have also not kept pace with construction cost inflation or the scale of accumulated need, with costs compounding over time and shifting need from preventative treatments towards costlier reconstruction and reactive repairs.

Asset management principles, as set out in the "Well Managed Highway Infrastructure – a Code of Practice", support the delivery of a systematic data-led, evidence-backed approach towards highways maintenance. This enables Hillingdon to make informed, risk-based decisions over how to prioritise resources for the management, operation, preservation and enhancement of highway infrastructure to meet the needs of current and future customers.

A New Approach for Hillingdon

Hillingdon has transitioned from a 'worst-first' approach to a strategy focused on increasing the lifespan of our roads and reducing the percentage of roads in need of repair by introducing a parallel programme of preventative maintenance. This forms the basis of our Highways Asset Management Plan. It will mean our annual maintenance programme will be divided between two distinct programmes of work:

- Major resurfacing schemes,
- Short patching (localised poor sections),
- Preventative maintenance schemes.

We have developed a 5-year work programme of both major resurfacing and preventative maintenance from 2023/24 onwards. This is the first step towards long-term programme development. The key question is how we will decide which roads should have preventative maintenance treatment and which we need to undertake major resurfacing works on?

Condition surveys have initially been used to determine which roads will be suitable for major resurfacing and preventative maintenance. For the 2023/24 programme and beyond, we will also take account of a range of factors other than road condition in our decision making, such as accident claims, defect records, complaints, road usage levels, and footfall.

HAMP Investment Plan

The council's total annual budget for highways maintenance is circa £11million. It is proposed to invest around 45% (or £5million) of the total highway budget on the carriageway asset. Of this, Hillingdon plans to spend 20% of the carriageway resurfacing budget on preventative maintenance and planned patching (short schemes) over the next five years. This translates to around £1m per annum. 80% (circa £4.2m) would be spent on structural schemes (i.e. major resurfacing works).

Around £7million will be spent on structural repairs of the footway asset. Following previous trials of surface (or preventative) treatments on Hillingdon's footways, a decision has been made not to introduce these on the network. A significant number of insurance claims and defect reports have been caused by deteriorating footway assets, and hence the budget was increased to tackle those issues and improve the network condition.

The above assumes that the 2023/24 to 2028/29 carriageway and footway resurfacing budgets are maintained at circa £11m per year. If there is any reduction or increase in funding over coming years, the percentage splits would be applied to the revised budgets.

Benefits

The HAMP will deliver better value for money through adoption of a forward-thinking maintenance strategy. Our customers will see more lengths of road maintained each year and have greater visibility as to the relative status of their roads. We will deliver more on the ground and help to meet many of our corporate and strategic transport objectives by doing so.

Vision & Aims

Hillingdon Council's vision is **'Putting our residents first'** which is underpinned by 4 key goals:



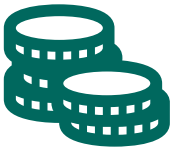
Our People - Putting our residents first and at the heart of all that we do, promoting civic pride.



Our Natural Environment - We will protect and enhance the borough's natural environment.



Our Built Environment - We will continue to improve our buildings, roads and footways and ensure that new buildings fit with the surrounding environment.



Financial Management - Maintain the solid approach to financial management that has delivered our success to date and which will be vital going forward.

The vision for highway assets sits within the Council's core priorities above, which is achieved by providing highway assets that are in good condition, fit for purpose, energy efficient, provide accessible services to our customers, represent value for money through long term planning, and enhanced allocation of resources. Moreover, we endeavour to provide improved service and quality of life to users with high customer satisfaction.

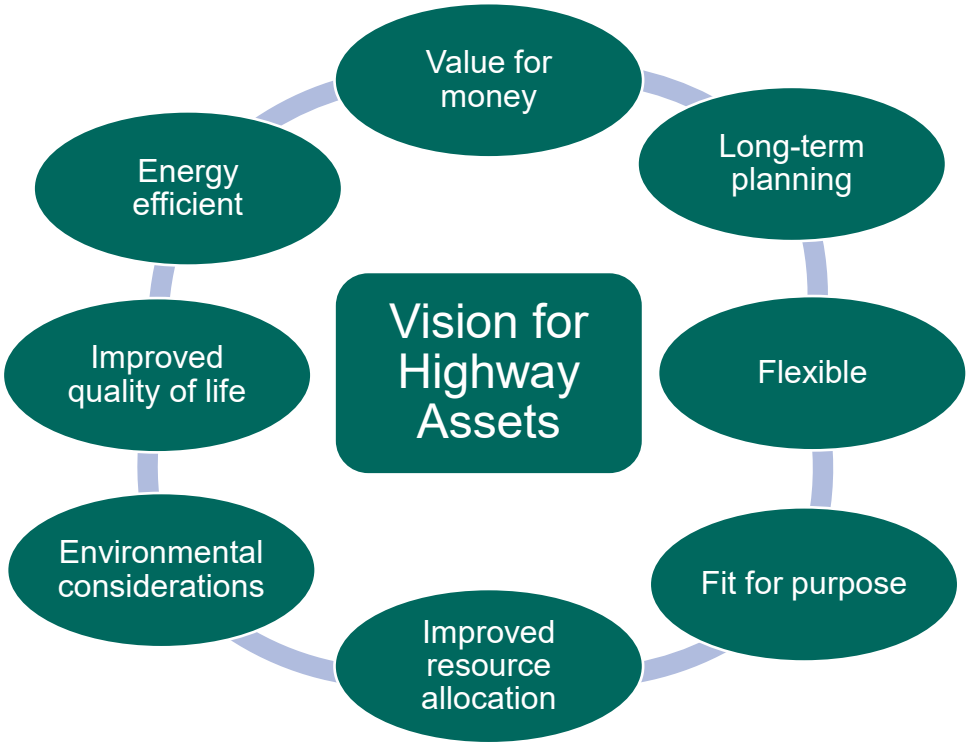


Figure 2: HAMP Vision

This operational highway asset management plan is intended to set a robust approach to asset management principles and practices. Sections below investigate long term highways investment to make the best use of resources and to ensure the right interventions are implemented at the right time, whether these are capital or reactive maintenance. This will help to ensure a safe highway and fulfil the Council's statutory requirement.

Asset Management Principles

The Audit Commission report on asset management principles highlights the challenge local authorities face in balancing conflicting pressures when deciding their maintenance strategies. Recent weather events have revealed the problems associated with poorly maintained highways, whereby local authorities have a backlog of several years in their road maintenance budgets just to bring the network up to a suitable standard.

The introduction of long-term asset management plans to maintain highways in an appropriate condition at a minimum whole-life cost are essential as reactive maintenance is extremely inefficient. Asset management has been widely accepted by central and local government as the standard to deliver a more efficient and effective approach to the management of highway infrastructure assets through longer term planning, ensuring that objectives are defined and achievable within available budgets.

Applying asset management principles will help the Council to resist reacting to short-term pressures in favour of highway asset maintenance strategies - a long-term view of how highways may be managed, focusing on outcomes by ensuring that funds are spent on activities that prevent expensive short-term repairs. This will make the best use of limited resources whilst minimising the risk involved in investing and deliver effective and efficient highway maintenance.

Such an approach enables more efficient and effective use of resources, while fulfilling statutory duties, delivering stakeholder needs and safeguarding the engineering integrity of the network.

Typically there are two options for prioritising spending on highway assets:

- **Worst-first** – focusing maintenance solely on roads and footways in the poorest condition. This is a high-cost approach, which meets short term public satisfaction but is not forward thinking and results in fewer roads being treated.
- **Whole-life cost** – focusing maintenance to minimise the total maintenance costs over the lifetime of the road (typically 20 to 25 years depending on the type of road). This strategy prioritises some funding for preventative works and results in only repairing safety defects on some poor condition roads, but improves long term public satisfaction, safety, and results in more roads being treated.

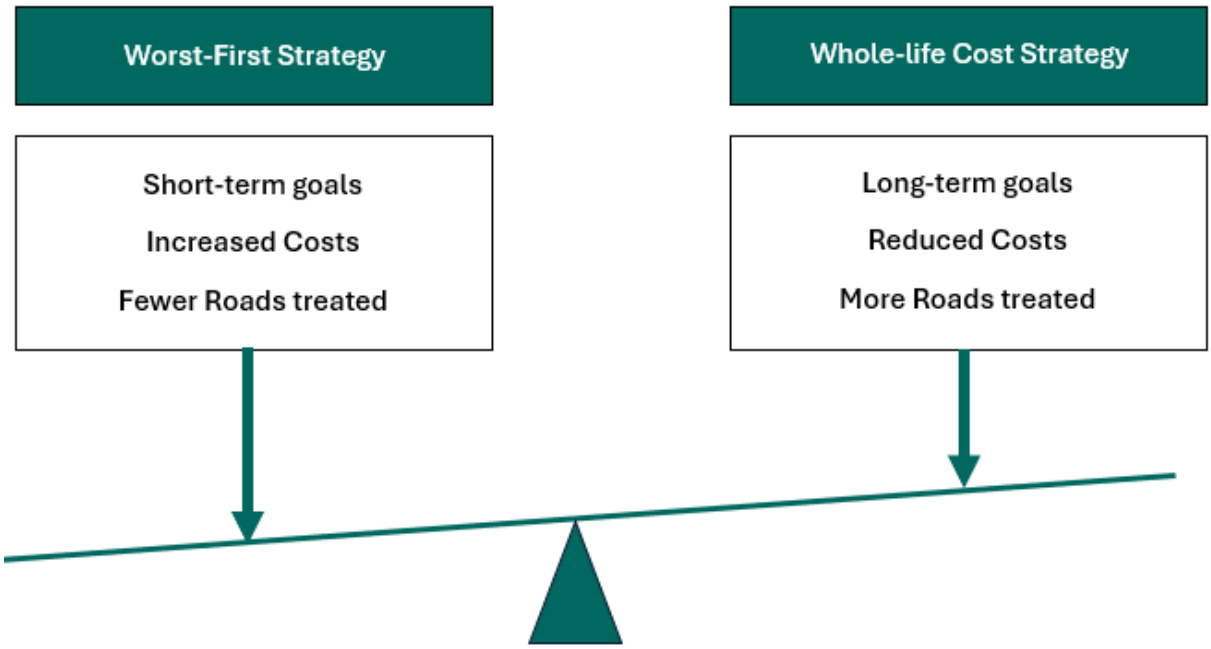


Figure 3: Asset management strategy

Stakeholder Engagement

Internal Leadership

Leadership and support with respect to asset management systems is vitally important to deliver the levels of service defined in this HAMP. The responsibility for managing the highway assets falls under the remit of the London Borough of Hillingdon and though the organogram shown below, reflects the responsibilities for highway policy development and delivery of highway network activities.

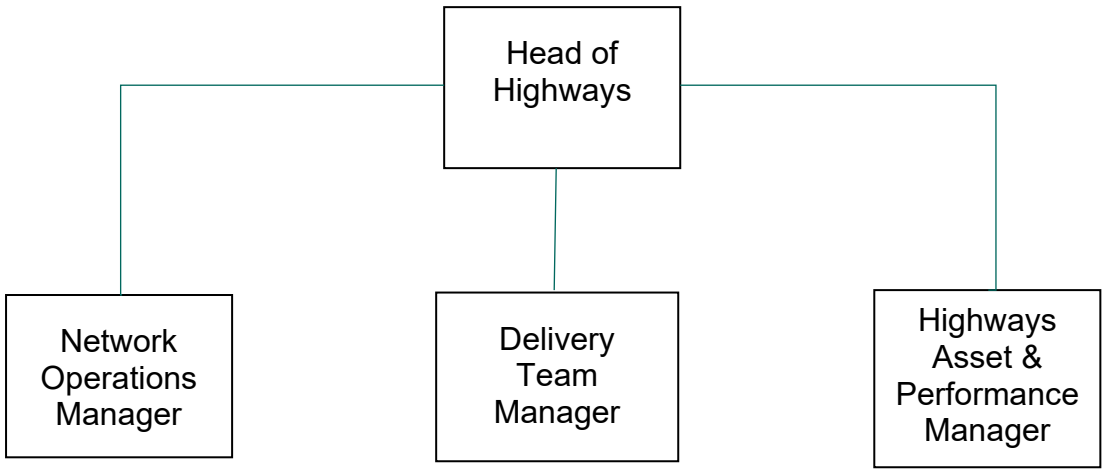


Figure 4: Highways division structure organogram

Stakeholders & Service Delivery

The asset management process also involves external companies which provide specific support to the council. They are listed below:

- O'hara Brothers – highways term service provider/contractor
- McCann – street lighting services
- Symology – asset management system
- Project centre – bridge inspections & design
- Vaisala RoadAI – carriageway condition surveys

Where projects are procured on a one-off basis, awareness is made of the current HAMP and asset management system to ensure compliance against it.

The council is keen on engaging with its residents and businesses in the delivery of its services. This engagement encourages constructive feedback which in turn, provides an opportunity to review and improve performance. Communication plans are used to present and explain the Council's proposed highway engineering works. These would ordinarily be posted to affected homes and businesses two weeks prior to the commencement of the works.

Feedback from customer enquiries received via the Council's online enquiry system are monitored by a dedicated team to ensure improvement areas are identified and current

standards are maintained. Feedback forms are also posted to affected properties close to the works once completed to assess the standards for work on site and to measure the contractor's performance.

The council also uses Customer Satisfaction scores as a measure of performance of the highway service via a satisfaction survey that is carried out on its constituents every three years.

Part B: Data-Driven Decisions

Highway Assets/Asset Knowledge

Inventory

A key function of the asset management process is to understand the spending needs of the different asset types and their components which comprise the highway network. In accordance with national guidance, the highway network is divided into the following asset types:

Table 1: Carriageways, footways and cycleways inventory

Roads	**Main Distributor**	51,662
	Secondary Distributor	20,343
	Link Road	52,700
	Local Access Road	574,151
Total		698,856 (m)
Footways	**Primary Walking Route**	14,197
	Secondary Walking Route	5,437
	Link Footway	46,824
	Local Access Footway	1,148,302
Total		1,214,760 (m)
Cycleways	**Part of carriageway/Footway**	8,890
	Remote from carriageway	38,520
	Cycle Trails	31,480
Total		78,890 (m)

Other assets that we maintain include:

Table 2: Other assets inventory

Public Rights of Way (PROW)	128,711 (m)
Highway Trees	16,000
Highway Gullies	30,000
Lighting Columns	24,000
Illuminated Traffic Signs	3,000
Illuminated Bollards	2,130
Non-Illuminated Traffic Signs (excluding parking signs)	2,850
Street Furniture (bollards, benches, railings)	1,106
Bridges	66
Footbridges	49
Retaining Walls	42
Culverts	27
Subways	10
Ditches	3,500

Carriageways and Footways

Carriageway and footway inventory data is stored in the 'Symology Insight Infrastructure Asset Management' database. Symology Insight allows the highway network to be stored in digital form, with each road having its unique reference. The network referencing system allows the attributes of each road such as construction materials and road width to be stored and analysed in conjunction with condition data.

The UK Pavement Management System (UKPMS) is a national system used by councils to record and assess the condition of local roads, kerbs, footways and cycle tracks. It helps councils plan maintenance work, decide where investment is needed, and report road condition information consistently. UKPMS is supported by the UK Roads Board and is used for national reporting on local road condition. Symology Insight, the Council's highway asset management system, is accredited for UKPMS use. Hillingdon's highway network is now fully referenced in the database for all road classes, and the network can also be viewed graphically within Symology Insight.

Internal systems are in place within the Council to ensure that as the network is added to (either through the construction of new roads or the modification of existing roads) then the network reference database is updated accordingly. Basic inventory data is held on the database. This includes surface type, carriageway and footway widths. No information is currently held on road construction depths.

Condition

Condition Surveys

Condition surveys are primarily intended to identify deficiencies in highway infrastructure which, if untreated, are likely to adversely affect its long-term performance and serviceability. There are a number of different types of survey, each provides information from a different perspective, and which in combination can provide a comprehensive picture of the condition of the asset. They provide information on the nature and severity of deterioration which is used to determine appropriate maintenance treatments in line with asset management objectives and inform asset valuations for Whole of Government Accounts (WGA). The latest survey undertaken in Hillingdon was an Annual Engineer's Inspections (AEI), an outcome-based survey that focuses on the type of treatments (if any) that are required for a given section of road or footway. The latest condition dataset for classified non-principal (B,C) and unclassified (U) roads shown in Figure 1 are derived from the AEI results, whereas the principal road network condition is derived from SCANNER surveys undertaken on the borough principal road network across London. SCANNER surveys are automated surveys employing specialised vehicles equipped with lasers to record critical road surface properties such as cracking, rutting and profile geometry to develop a road condition indicator for every section.

The purpose of condition assessments is to address the key objective of network sustainability and to ensure that value for money is achieved when undertaking structural repairs. The selection and timing of structural maintenance treatments will always involve engineering judgement. It is important that engineers have quality data regarding the condition of the network to help inform decisions regarding the selection and prioritisation of treatments. Data from these surveys are also used in the production of National Indicators and repeatable condition surveys allow for analysis of trends within the network.

From 2026/27, PAS2161-accredited surveys will be carried out on Hillingdon's network using Artificial Intelligence (AI) to improve efficiency and increase objectivity of the outputs. This standard was introduced by the Department for Transport (DfT) to ensure consistency of reported figures across the country, and allow for implementation of new technologies, such as AI systems, as accredited survey technologies alongside traditional methods.

Value

The Audit Commission has set requirements for the way the value of highway assets are reported to HM Treasury in Hillingdon's audited accounts. Hillingdon Council will continue to develop its data, records and depreciation modelling in order to provide accurate information to satisfy the financial reporting requirements defined in the Transport Infrastructure Assets Code, published by the Chartered Institute of Public Finance and Accountancy (CIPFA) May 2013 and any subsequent amendments or directives issued.

Table 3: Asset valuation (2024)

Asset Type	Gross Replacement Cost (£,000s)
Roads	1,261,374
Footways and Cycle Lanes	261,253
Bridges and Structures	184,393

Highways Trees	20,000
Road Gullies	415,512
Street Lighting and other illuminated Street Furniture	50,000
Street Furniture	9,432

Hillingdon's carriageway and footway network has an indicative gross replacement value of £2.2billion (excluding the land value) making it one of the most valuable Council assets. This valuation is useful to demonstrate the comparative size of the highway asset against other Council owned assets and to benchmark maintenance spending. Currently less than 1% of the highway asset value is spent annually on maintenance.

Lifecycle Planning

Lifecycle planning is the process used to relate levels of service, current condition and future maintenance and budget requirements for an asset or group of assets. A detailed lifecycle maintenance plan will chart an asset's life from creation to expiration, setting out the best options for maintaining it over the course of its lifecycle. When considered alongside defined outcomes or levels of service, lifecycle planning enables funding requirements to be clearly identified, and maintenance works to be properly planned for in the most effective period of the asset's lifecycle.

Effective lifecycle planning will assist us in moving away from the traditional 'worst-first' approach, instead targeting investment at assets which represent the greatest risk or where treatment would deliver the optimum benefit against the Council's strategic objectives, hence the long term aim is to be able to identify the optimal investment profile required to deliver a specified level of service, thereby allowing economically optimal solutions to be identified.

Lifecycle planning techniques enable links to be made between a particular asset or group of assets, levels of service, the current condition, future maintenance needs and future funding for the asset. Its objectives are to:

- Identify long-term investment for highway infrastructure assets and develop an appropriate maintenance strategy;
- Predict future performance of highway infrastructure assets for different levels of investment and different maintenance strategies;
- Determine the level of investment required to achieve the required performance;
- Determine the performance that will be achieved for available funding and/or future investment;
- Support decision making, the case for investing in maintenance activities and demonstrate the impact of different funding scenarios;
- Minimise costs over the lifecycle while maintaining the required performance; and
- Eliminate the backlog of repairs

Asset Deterioration

Understanding the condition of highway assets is essential in planning for future decision making and investment requirement to maintain or improve their condition. Assets deteriorate at different rates and decisions have to be made about strategies for maintaining them during their life. The need for reactive repairs increases as assets deteriorate. Therefore, a balance has to be found between capital investment (through timely interventions to arrest deterioration) and revenue maintenance (through costly reactive revenue repairs). It is in the interests of the Council to extend the life of its highway assets to avoid the need for early capital renewal at high cost.

Highway assets deteriorate over time depending on usage e.g. volumes of traffic they carry and the environmental conditions they are subject to (weathering). These assets can often be more effectively restored to 'nearly new' condition and their lives extended by intervening at the right point in the life cycle. As they further deteriorate, more expensive interventions may be required to restore the road to nearly new condition. Allowing assets to deteriorate below the failure threshold therefore represents poor value for money.

The following chart indicates how highway assets deteriorate with time. Timely maintenance to arrest deterioration is significantly more cost effective than allowing the asset to deteriorate into the 'red zone' before intervention occurs. It must be noted that this type of timely intervention moves away from a more traditional ‘worst-first’ approach and targets work programmes at those parts of the infrastructure which present the greatest risk and where early treatment can achieve the most beneficial whole life cost.

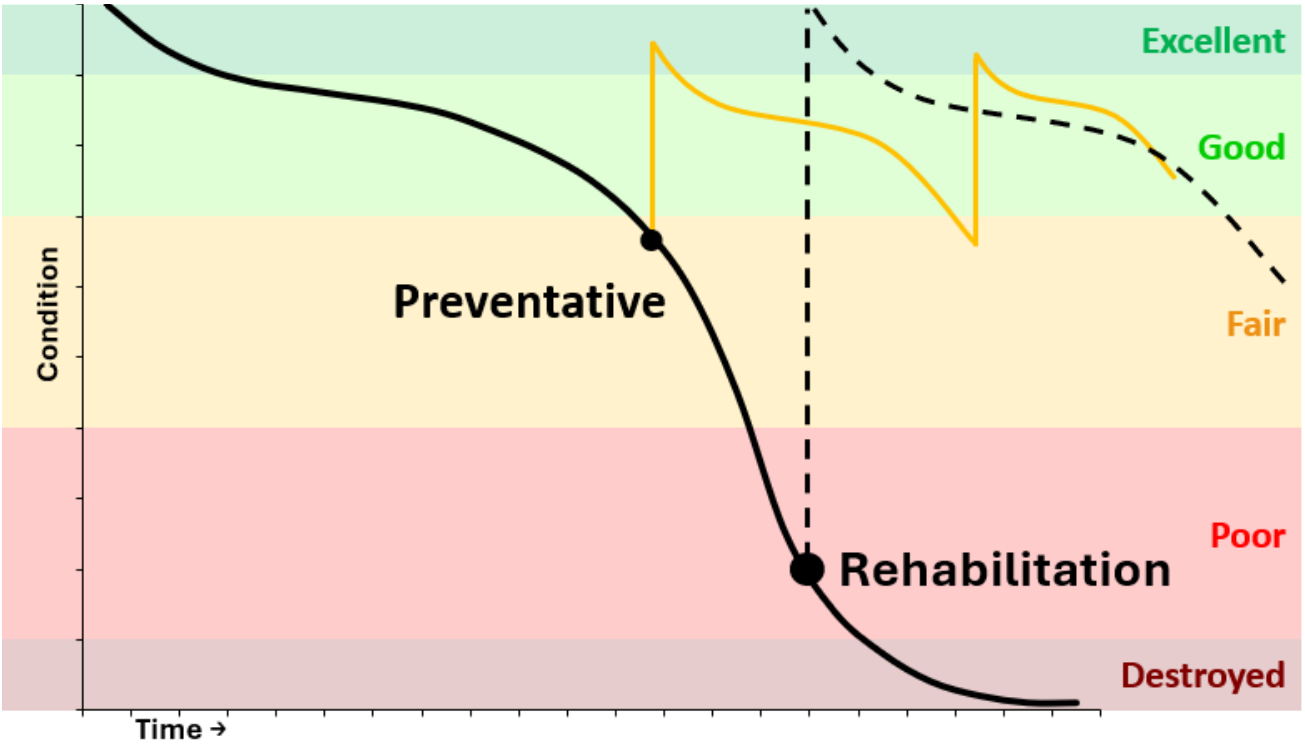


Figure 5: Deterioration modelling

Existing Policy

Hillingdon Council has transitioned to a ‘whole-life cost’ approach to asset management where the funding is split between structural maintenance for major schemes and shorter localised poor sections (shown by the black line), as well as preventative maintenance on roads in ‘fair’ condition (shown by the yellow line). This approach utilises cost effective treatments at the right locations and at the right time in the asset’s lifecycle, thereby extending the lifespan of the assets, providing significant cost benefits as the regular maintenance keeps the asset in a good condition.

Funding and Expenditure

It is important to understand the funding levels required for the delivery and improvement of the highway network. Funding for highway asset maintenance, upgrade and renewal can be split into capital and revenue expenditure.

Capital funding can be defined as “investment that will increase the value of the asset”. Capital expenditure for maintenance is generally associated with upgrading and renewal and is used to improve the life of assets by strengthening or replacing them, (e.g. overlaying a carriageway surface). All resurfacing of non-principal and unclassified roads is funded by Hillingdon Council. Since 2025/26, this has been supported by a significant increase from the Department for Transport (DfT), as part of the Government's commitment to record levels of highways maintenance investment, with allocations confirmed through to 2029/30. Hillingdon will receive up to £14.6m over the next four years, of which £9.2m forms a guaranteed baseline element, with an additional £5.4m in incentive funding subject to meeting certain criteria. TfL funding is used to maintain A roads; however, this has been significantly reduced, dropping to figures below £100,000. Total borough highway maintenance capital expenditure for 2026/27 is around £11.3m.

Revenue funding can be defined as “investment that will maintain or reduce the rate of depreciation of the value of the asset”. All routine and reactive maintenance works on the highway are funded by Hillingdon Council. Total highway maintenance revenue budget for 2026/27 is projected to be around £1.0m.

Investment & Prioritisation

The long-term forward programme of capital highway maintenance schemes is identified and prioritised through the lifecycle planning process. A preventative approach is at the heart of the prioritisation process. Capital investment will, wherever appropriate, be prioritised towards roads in the early stages of deterioration where a lower cost treatment can be applied to prolong service life. This approach minimises the amount of network that deteriorates annually to the point where high-cost, strengthening treatments are required, and therefore ensures value for money and minimal whole life maintenance cost. This preventative approach enables a much larger proportion of the network to be treated annually than if a 'worst-first' approach were taken requiring higher cost treatments. The preventative approach also reduces the formation of localised defects such as potholes on treated roads, leading to a reduction in the revenue budget spent on reactive maintenance.

We wish to ensure that our carriageway and footway maintenance programmes are developed in a transparent and objective manner therefore prioritisation will be carried out using the results of condition surveys of the high usage network plus survey results for those which have been nominated for inclusion in the survey programme by engineers / inspectors / elected members / insurance team / petitions.

A longer-term programme provides an opportunity to develop and integrate forward works programme and predict network condition improvement.

It is proposed to invest around 30% of the capital funding in preventative maintenance and 70% on major resurfacing work. The forward programme will deliver value for money and will also enable us to improve more miles of road each year which will be valued by our customers and meet the corporate objective of ***'Putting our residents first'***.

We may deviate from the priority order where, for instance, a section of road or footway in relatively good condition may be resurfaced if it is on a street where the majority of the rest of the road needs maintenance and it would be illogical, or impractical, not to resurface the whole road.

The prioritised future years works programmes of highways capital resurfacing schemes will be reviewed and updated based on the results of the latest road condition survey data.

Works Programming

Carriageways & Footways

Hillingdon develops an annual indicative priority maintenance list of the carriageways and footways over the next five years. This helps forecast budget requirements and works coordination with utility companies and other Council projects and major developments.

This 5-year indicative list of works will be further developed using collected condition information, non-engineering factors (road safety records, road usage levels, bus routes, proximity to schools, footfall), member, and petition requests. At the same time, we are preparing a preventive maintenance forward programme for carriageways only. These are the roads where in most cases we wish to provide a surface overlay or shallow plane and resurface to seal the surface and extend the life of the assets. Roads that have a poor surface or ride quality but are structurally sound can therefore be treated with lower cost thin surfacing or overlay to extend the operational lifespan.

Work programme inputs:

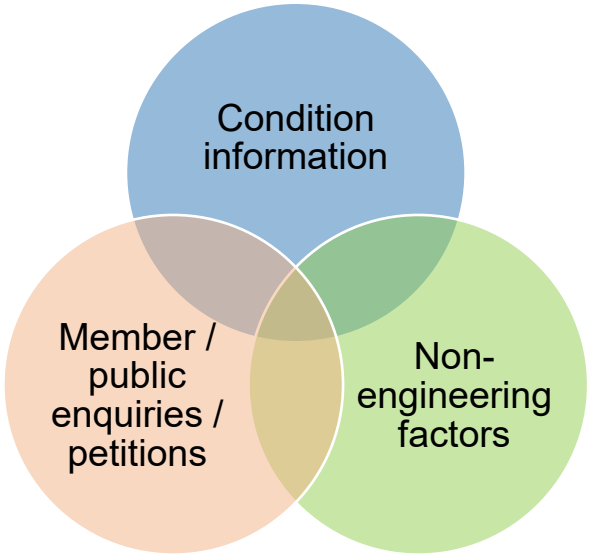


Figure 6: Works programme inputs

Preventative maintenance schemes (carriageways only)

Our footway programme (pavement resurfacing) will not be impacted by this approach as Hillingdon's footway asset is largely constructed in paving slabs. Preventative maintenance for footway repairs is therefore limited to reactive defect repairs (or short sections) until the section requires ongoing and continuous repair, when it will then be treated. Thin surfacing treatments cannot be used on paving slabs.

Condition information and typical treatments:

Table 4: Condition bands description

Condition	Description	Typical treatment
Red	Poor condition. Structural maintenance should be considered.	Reconstruction or deep plane and resurface.
Amber	Condition deteriorating. Preventative maintenance should be considered.	Overlay or shallow plane and resurface.
Green	Generally good condition.	Minor potholing only if required.

Short section programme

A short section repair programme will be particularly helpful, as it provides an investment budget each year that can be used to target short lengths of carriageway or footway that have multiple defects. Those lengths of carriageway or footway could then be repaired as part of a wider capital maintenance programme, as opposed to temporary reactive repairs of individual defects or larger patch repairs as and when they are inspected or reported. This would mean that a larger number of defects will be permanently fixed across the borough in a shorter space of time with minimal disruption.

Coring programme

The purpose of coring is to ensure that the highway is correctly designed and maintained. Advanced coring will identify the depth and type of construction layers present in existing roads. Coring involves cutting a circular hole in the road, removing the contents intact as a solid 'core' and then manually measuring and identifying the materials as well as the defects present in the various layers. This information is essential to design properly and to determine the most appropriate materials for maintenance schemes e.g. structural or surface course repairs and to identify the presence of tar.

Part C: Environment & Resilience

Environment & Sustainability

Sustainability

Sustainability appraisals are fundamental for highway maintenance to stimulate innovation and creativity. Materials, products and processes will be reviewed to keep maintenance operations and the design of future schemes up to date.

The suitability of surfacing materials and treatments, sustainable drainage systems (SuDS) and raingardens will be considered to help to control flooding, allow the use of retained water for maintenance activities, contribute to lower carbon emissions and improve the public realm.

Material choices

The construction and maintenance of highways presents many opportunities for sustainability. We plan to achieve sustainability in highway maintenance and construction by making informed choices about the materials and techniques we employ, with the choice of materials based on evidence of environmental impact. It may be possible to use locally available material where practicable as long as they meet the specification and do not have any adverse environmental effects.

Priority will be given to maximise the reuse and recycling of materials where it is not possible to plane and dispose. Recycling produces significant savings from reduced energy requirements for mineral extraction, transport, mixing and disposal of excavated material. Hillingdon currently recycles 100% of materials from carriageway resurfacing.

Hillingdon uses the 'Rhinopatch' method for repairing bituminous surfacing. This is a sustainable infra-red carriageway heating technology which uses machinery to heat and rejuvenate the road surface, eliminating the need to install new surfacing. This is both more sustainable and cost effective than traditional road patching.

Innovation & Future Demand

Hillingdon is currently trialling the following products and will explore further opportunities to utilise innovative materials to promote sustainability.

- **Warm mix asphalt (WMA)** – An innovative approach to road construction and maintenance offering enhanced efficiencies and lower carbon production. The principle behind WMA is to manufacture and lay asphalt at lower temperatures, thereby using less energy and delivering meaningful carbon savings, without compromising performance.
- **Recycled sub-base material** – 'Aggrebind' is a cementitious binder which enables the re-use of almost 96% of excavated spoil, diverting waste from landfill and eliminating the import of quarried aggregate.
- **Geotextile mesh reinforcement** – Asphalt geotextile reinforcement aims to reduce cracking in asphalt surfacing placed over cracked substrates, or joints in underlying concrete slabs or cracks in cement-bound base layers. They can reduce surface rutting, differential settlement and extend operational life.
- **'RhinoPatching'** –this technique reheats the road surface to soften the binder and rejuvenate the materials, without the need for replacement.
- **OHBM** – Hillingdon's term maintenance contractor developed a bespoke footway construction product that replaces conventional layers with a singular 150mm layer offering similar structural performance while reducing construction duration, costs and emissions.

Waste management plans for individual schemes are also being implemented to ensure that construction waste is minimised to make recycling normal practice.

Future Demand

Hillingdon's ageing road network will need to respond to changes due to climate change and improve resilience to adverse weather. The asset management plan, predictive deterioration assessments and future maintenance strategies will need to take these factors into account. Although good progress has been made in recent years in reducing the maintenance backlog, substantial programmes of continued investment will be required in the future.

Next Steps

The HAMP is a live and flexible document, which will evolve over time, to suit changing budgets and policies, and to reflect our progress in implementing whole life planning principles. A phased approach towards the development of the HAMP is proposed. Initially it will focus on the core highway assets (roads and footways) but will subsequently evolve to cover the full range of highway assets