

	Resources and Public Realm Committee Briefing Note
	Report from the Corporate Director, Neighbourhoods and Regeneration
Brent's Methodology for Prioritising Highways Maintenance and Investment	

Wards Affected:	All
Key or Non-Key Decision:	N/A
Open or Part/Fully Exempt: (If exempt, please highlight relevant paragraph of Part 1, Schedule 12A of 1972 Local Government Act)	Open
No. of Appendices:	1
Background Papers:	N/A
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1.0 Executive Summary

This briefing note explains the methodology used by Brent Council to prioritise highways maintenance and investment across the borough. The approach is founded on asset management principles that seek to maximise the service life of highway assets, minimise whole-life costs, manage risk, and deliver the greatest benefit from available funding. The methodology combines condition-based evidence, engineering judgement, risk assessment, asset hierarchy, public feedback and financial considerations to produce annual investment programmes for carriageways, footways, drainage infrastructure, highway structures and associated assets.

The Council's approach is underpinned by the Highway Asset Management Plan (HAMP), adopted in 2014, and uses modern surveying techniques, Artificial Intelligence (AI), asset management software and risk-based prioritisation models to ensure investment is directed where it delivers the highest value and greatest network benefit.

2.0 Recommendation(s)

It is recommended that the Scrutiny Committee:

- Notes the methodology used by Brent Council to prioritise highways maintenance and capital investment.
- Notes how condition data, risk assessments, asset hierarchy and stakeholder input are used to determine annual maintenance programmes.
- Notes the role of asset management principles in ensuring investment achieves optimal value for money and network resilience.
- Notes the illustrative case studies contained within this briefing note demonstrating how the methodology is applied in practice.

3.0 Detail

3.1 Cabinet Member Foreword

Brent's highway network is one of the Council's most valuable and visible public assets. It supports everyday journeys, public transport, businesses, schools, hospitals, local communities and the wider economy.

Maintaining such a large asset network requires significant and sustained investment. However, available funding is finite, while the condition of roads, pavements, drainage assets and structures continually changes.

The Council therefore takes an asset management approach to investment. Rather than waiting for assets to fail and then responding through increasingly expensive reactive repairs, the Council seeks to identify deterioration at an earlier stage and intervene with the most appropriate treatment.

This approach enables the Council to make better use of available funding by considering not only where an asset is in poor condition, but also the consequences of that condition, the importance of the asset to the network, the likely benefit of intervention and the relative cost of different treatments.

The methodology provides a consistent and transparent framework for making these difficult choices while allowing professional engineering judgement to be applied where circumstances require it.

3.2 Background

3.2.1 Highway Asset Management Principles

The Council adopted its Highway Asset Management Plan (HAMP) in 2014. The Plan promotes a preventative maintenance philosophy designed to:

- Preserve asset life before failure occurs;
- Reduce long-term maintenance costs;
- Improve network condition;
- Minimise reactive repairs; and
- Deliver best value for residents and taxpayers.

The strategy seeks to intervene at the most economically advantageous point within the asset lifecycle. Preventative treatments are prioritised where deterioration is limited, whilst more substantial resurfacing and reconstruction works are reserved for assets where deterioration has progressed further.

3.2.2 Asset Condition Intelligence

The Council has modernised its data collection processes through borough-wide video surveys and AI-driven condition assessment technology.

These surveys enable:

- Rapid assessment of the entire highway network;
- Automated identification and categorisation of defects;
- Identification of deteriorating carriageways and road markings;
- Collection of traffic sign inventory data; and
- Faster conversion of survey results into maintenance programmes.

The collected data is integrated into the Council's Asset Management software, which models asset deterioration, identifies suitable treatments and develops prioritised work programmes within available budgets.

3.3 Methodology for Prioritising Investment

The Council's methodology is based on two principal components:

A. Treatment Benefit

The first stage determines whether maintenance intervention is required and what form it should take. This involves:

- a) Modelling how an asset will deteriorate if no action is taken.
- b) Identifying appropriate interventions such as:
 - Thin surfacing;
 - Injection patching;
 - 20mm resurfacing;
 - 40mm resurfacing; or
 - Full reconstruction.
- c) Dividing roads into subsections and assessing each separately.
- d) Calculating a Benefit Cost Ratio (BCR) by comparing anticipated condition improvement with treatment cost.
- e) Producing an overall Treatment Benefit score.

This is discussed in more detail in Appendix 1 below – Detailed Discussion of the Benefit Cost Ratio (BCR) calculation

B. Prioritisation Benefit

Additional weighting is then applied using broader risk and service considerations. These include:

Claims Priority - roads with a history of public liability claims receive greater weighting. Claims are normalised against road length to ensure fair comparison.

Defects Priority - roads with higher levels of reported defects or requiring significant reactive maintenance receive increased priority. Defects include potholes, cracking and safety defects identified through inspections or customer reports.

Councillor Nominations- member concerns and annual councillor nominations are incorporated into the prioritisation process.

Network Hierarchy- roads are prioritised according to their strategic function within the highway network, considering:

- Traffic volumes;
- Public transport routes;
- Access to schools;
- Access to hospitals;
- Economic importance;
- Network resilience requirements.
- Skidding Resistance Risk

Although currently incorporated indirectly through hierarchy weighting, skidding resistance and associated safety risks are considered when prioritising interventions. The Council intends to integrate skidding resistance more directly into future analyses.

The weighting for the various factors is as follows:

	A	B	C
1	Category	Priority	Weighting
2	Engineering Assessment Score	Engineering Assessment Score = 2 or less	0.02
3	Engineering Assessment Score	Engineering Assessment Score = 3-4	0.05
4	Engineering Assessment Score	Engineering Assessment Score = 5-6	0.15
5	Engineering Assessment Score	Engineering Assessment Score = 7 or more	0.2
6	Defects	0-50 Metres Per Defect	0.2
7	Defects	50-100 Metres Per Defect	0.15
8	Defects	100-200 Metres Per Defect	0.1
9	Defects	>200 Metres Per Defect	0.05
10	Claims	0-100 Metres Per Claim	0.15
11	Claims	100-200 Metres Per Claim	0.11
12	Claims	200-500 Metres Per Claim	0.08
13	Claims	>500 Metres Per Claim	0.04
14	Councillor Nominations	1 Nomination	0.04
15	Councillor Nominations	2 Nominations	0.08
16	Accidents	1 Accident	0.05
17	Hierarchy	E	0
18	Hierarchy	D	0.07
19	Hierarchy	C	0.13
20	Hierarchy	B	0.2

3.4 Engineering Review and Final Programme Development

3.4.1 Final Programme Development

The individual factors are scored and weighted according to their relative importance and, where relevant, the length of highway requiring treatment. The resulting prioritisation score provides a relative ranking of maintenance need. This can be summarised as:

Condition and deterioration → identify treatment → calculate treatment benefit/BCR → assess wider risk and strategic factors → combine scores → engineering review → develop programme.

Asset Management software produces a prioritised list of candidate schemes. Officers then apply budget constraints where appropriate.

3.4.2 Illustrative Case Studies

Case Study 1 – Two Roads with Similar Condition but Different Network Importance - Two roads may have broadly comparable condition scores and both require maintenance. However, one may be a higher hierarchy route carrying substantially more traffic and providing access to important destinations such as schools, hospitals or employment areas. Under the methodology, the higher hierarchy road would receive an additional prioritisation benefit because of its network function.

Result: the higher hierarchy route may be prioritised even where its physical condition is not the worst in the borough.

Principle demonstrated: maintenance priority is based on risk and network importance as well as physical condition.

Case Study 2 – A Road with Repeated Pothole Defects - A residential road may not rank among the borough's very worst roads in terms of overall structural condition. However, it may generate a disproportionately high number of reactive defects. The defects priority score reflects the frequency of defects relative to the road's length.

If the road also has a reasonable Treatment Benefit—because a relatively modest planned intervention could prevent continuing deterioration—the combined score may make it a candidate for planned maintenance.

Result: planned investment can be justified where it reduces continuing reactive maintenance activity and prevents further deterioration.

Principle demonstrated: the methodology recognises the value of moving from reactive repairs to planned preventative intervention.

Case Study 3 – Early Preventative Treatment versus Major Resurfacing A section of road may exhibit deterioration in its surface but still retain an underlying structure that is fundamentally sound. The methodology can identify this as a candidate for a thinner surface treatment rather than major resurfacing. Conversely, where deterioration has progressed further and the underlying road structure is compromised, a more substantial treatment such as 40 mm resurfacing or reconstruction may be identified.

Result: the Council does not automatically use the most expensive treatment. The intervention is matched to the condition and predicted deterioration of the asset.

Principle demonstrated: the right treatment at the right time can extend asset life and reduce whole-life cost.

Case Study 4 – Whole-Road Treatment - The prioritisation system can identify individual sections of a road requiring maintenance. However, the Council's programme is often developed on a whole-road basis. A section in relatively good condition may therefore be included where the remainder of the street requires treatment and resurfacing the entire street is more logical or practical. For longer roads, the Council can instead target a section between junctions where the priority is highest.

Result: the computer-generated priority is not applied mechanically. Officers consider constructability, continuity of treatment and the practical delivery of a scheme.

Principle demonstrated: engineering judgement and practical delivery considerations complement the asset management model.

Case Study 5 – Injection Patching - Injection patching provides an example of how the Council uses a lower-cost preventative intervention to address a large number of defects quickly. Injection patching is a particularly useful intervention on residential roads.

The method can treat a large number of potholes rapidly and at substantially lower cost than conventional deep patching. On average, an injection patching repair costs approximately one third of a traditional 1 m² repair at 100 mm depth.

Result: limited funding can address a substantially greater number of defects while more extensive treatments are reserved for locations where they provide greater long-term benefit.

Principle demonstrated: value for money and scale of benefit are important components of investment decisions.

Case Study 6 – Road Marking Renewal - Road marking deterioration is identified through the borough-wide video condition survey. Rather than relying solely on individual complaints, the Council can use network-wide survey information to identify faded markings and produce an intelligence-led programme. The asset management system then prioritises the works.

Result: the Council can target road-marking expenditure according to objectively identified need across the network.

Principle demonstrated: the same asset management philosophy can be applied to different highway asset types, not simply carriageway condition.

4.0 Stakeholder and Ward Member Consultation and Engagement

The prioritisation methodology incorporates stakeholder input while retaining an evidence-based approach. Councillor nominations are specifically included as one of the prioritisation factors used in developing annual maintenance programmes.

This provides an important mechanism for local knowledge to influence investment decisions. Ward Members and residents may identify recurring problems or local circumstances that are not necessarily fully captured by a condition survey.

However, nominations are considered alongside condition, defects, claims, network hierarchy and treatment benefit. This provides a balance between local knowledge and objective asset management evidence.

The methodology therefore recognises that effective highways asset management requires both network-wide technical data, and local knowledge and stakeholder intelligence.

5.0 Financial Considerations

The prioritisation methodology is particularly important because the Council cannot fund every maintenance requirement identified through condition surveys.

The asset management system is therefore used to determine how available funding can achieve optimum condition improvement, taking account of asset deterioration.

The use of BCR and Treatment Benefit is particularly important in this context. It enables alternative interventions and locations to be compared on the basis of the expected benefit obtained for the available expenditure. The methodology also supports financial efficiency by:

- identifying preventative interventions before deterioration becomes more severe;
- reducing reliance on more expensive reactive repairs;
- selecting treatments appropriate to the actual condition of the asset;
- concentrating investment where it provides the greatest benefit;
- considering the whole road where this provides a more efficient intervention; and
- allowing dedicated budgets to address short sections and emerging priorities.

The underlying principle is therefore not simply to maximise the amount of highway treated, but to maximise the benefit obtained from the available maintenance budget.

6.0 Legal Considerations

Section 41 of the Highways Act 1980 places a duty on the Council, as highway authority, to maintain the public highway. The Council's highway maintenance programme must make sufficient provision to enable it to meet this statutory duty. Failure to maintain the highway can result in liability where injury or loss occurs as a consequence.

The asset management methodology supports the Council in discharging this responsibility by providing a structured process for identifying and managing highway maintenance risks.

A risk-based methodology is particularly appropriate because the Council must manage a very large asset portfolio against finite resources. The methodology provides a systematic means of identifying priorities rather than relying solely on individual requests or subjective assessments.

7.0 Equity, Diversity and Inclusion Considerations

The prioritisation approach supports accessibility and inclusivity through the design and delivery of maintenance schemes, including provision for mobility-impaired users, wheelchair users and those with visual impairments.

The prioritisation methodology can therefore be viewed as part of a wider approach in which asset condition and risk determine where investment is directed, while the design and delivery of individual schemes ensure that accessibility requirements are addressed

8.0 Climate Change and Environmental Considerations

The Council's methodology aligns closely with climate objectives by:

- Promoting preventative maintenance;
- Extending asset life;
- Reducing reactive interventions;
- Using lower-carbon materials where possible;

- Reusing existing materials such as granite kerbs; and
- Maximising recycling of highway materials.

Preventative maintenance is particularly important because preserving assets before structural failure generally requires fewer materials, less energy and lower carbon emissions than reconstruction.

9.0 Human Resources/Property Considerations

There are no specific Human Resources or Property considerations arising directly from this methodology.

10.0 Communication Considerations

The use of transparent, evidence-based prioritisation supports clear communication with residents, councillors and stakeholders by demonstrating that investment decisions are based upon objective condition data, risk, value for money and strategic need rather than reactive decision making.

Appendix 1 – Detailed Discussion of the Benefit Cost Ratio (BCR) calculation

The Treatment Benefit element of the prioritisation methodology is more sophisticated than simply identifying the roads in the worst condition or dividing the cost of a scheme by its length.

The Council's asset management software uses the detailed condition survey data to model the condition of individual sections of carriageway and identify the most appropriate treatment. The process operates at a much more granular level than the final road or scheme shown in the programme.

First, the system establishes how the carriageway is expected to deteriorate if no intervention takes place. The deterioration profile can be developed using historical condition data. The system then applies defined treatment rules and intervention thresholds. For example, depending on the condition of the carriageway, the appropriate intervention might be a 20mm resurfacing treatment, a 40mm resurfacing treatment or full reconstruction.

The calculation is then undertaken across relatively short sections of the carriageway e.g. 20m subsections. For each subsection, the software examines the available condition data against the treatment rules and determines whether an intervention is required and, if so, what treatment is appropriate. Adjacent subsections requiring compatible treatments can then be combined into a larger scheme.

For each subsection, the software calculates a Benefit Cost Ratio (BCR) based on:

$$\text{BCR} = \text{expected improvement in condition} \div \text{cost of the treatment}$$

The "benefit" is the expected improvement in the condition of that subsection resulting from the proposed treatment. The calculation is then aggregated across the length of carriageway identified for maintenance to produce an Average Treatment Benefit for the road/scheme.

This is considerably more complicated than a spreadsheet exercise. The important point is that the BCR is not calculated once for each road using a single condition score. It is generated from a series of linked calculations undertaken across the network.

For example, a single road might contain:

Section	Existing condition	Treatment identified	Cost	Expected condition improvement	BCR
0–20m	Poor	Reconstruction	£X	High	High
20–40m	Fair/Poor	40mm resurfacing	£X	Medium	Medium
40–60m	Good	No treatment	£0	–	–
60–80m	Poor	20mm resurfacing	£X	High	High
80–100m	Fair	20mm resurfacing	£X	Medium	Medium

The software performs this type of assessment across the surveyed network, using the condition information and the Council's defined treatment rules. It then brings together appropriate adjoining sections into practical schemes and calculates the resulting treatment benefit.

Consequently, the calculation involves a number of interdependent stages:

1. **Survey data** – detailed condition information for the network.
2. **Condition assessment** – determining the current condition of each subsection.
3. **Deterioration modelling** – estimating how condition will change without intervention.
4. **Treatment triggers** – determining when intervention is appropriate.
5. **Treatment selection** – identifying the appropriate treatment for each subsection.
6. **Treatment costing** – determining the cost associated with the proposed intervention.
7. **Benefit calculation** – determining the expected improvement in condition resulting from the intervention.
8. **BCR calculation** – comparing the expected improvement with the treatment cost.
9. **Aggregation** – combining the results across the relevant treatment length to calculate the Average Treatment Benefit.
10. **Scheme formation** – combining adjacent sections into practical maintenance schemes.
11. **Overall prioritisation** – combining the Treatment Benefit with the separate Prioritisation Benefit factors.

This is why the methodology should not be characterised as simply "putting roads into a spreadsheet and ranking them from worst to best." The software is effectively processing a large number of individual road sections and treatment possibilities before producing the prioritised programme.

The value of the asset management system is not simply the ability to calculate a ratio. It is its ability to apply the methodology consistently to a very large number of individual sections of the highway network and then use the results to construct an optimum programme within a defined budget.

The Average Treatment Benefit is then combined with claims, defects, Member nominations and road hierarchy to arrive at the final priority score. That is arguably the most important part of the methodology to explain, because it demonstrates why a road with the highest BCR is not automatically the first road to be resurfaced.