

	<h2>Environment Committee</h2> <h3>11 January 2016</h3>
<p style="text-align: right;"><b>Title</b></p>	<p><b>Whole Life Costing of Footway Maintenance Treatments and Scheme Prioritisation</b></p>
<p style="text-align: right;"><b>Report of</b></p>	<p>Commissioning Director, Environment</p>
<p style="text-align: right;"><b>Wards</b></p>	<p>All</p>
<p style="text-align: right;"><b>Status</b></p>	<p>Public</p>
<p style="text-align: right;"><b>Urgent</b></p>	<p>No</p>
<p style="text-align: right;"><b>Key</b></p>	<p>Yes</p>
<p style="text-align: right;"><b>Enclosures</b></p>	<p>Appendix 1: Prioritisation Process Flow Chart                  Appendix 2: Standardised Footway Construction Details                  Appendix 3: Independent Transport Laboratory: Report on Whole Life Value of Footways &amp; Cycle Tracks</p>
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<h2>Summary</h2>	
1.0	This report explains the concept of whole life costing highway asset management and references a suitable 'toolbox' of standardised footway construction designs that deliver long term value for money and are affordable. Guidance for their application and use to deliver the LBB Network Recovery Plan (£50m/5 year) programme is included.
2.0	The service benefits will be:- <ul style="list-style-type: none"> <li>a. To achieve a strategic requirement for an increased percentage surface area of LBB footways benefiting from cost effective planned maintenance and:</li> <li>b. Improved transparency and consistency in the delivery of planned footway maintenance prioritisation and the use of standardised materials and designs in footway maintenance.</li> </ul>

3.0 The report includes an explanation of how whole life costs are applied to the Network Recovery Plan prioritisation process (Appendix 1).

## Recommendations

That the Committee approves the following:-

1. The application of best practice whole life costs principles to prioritise and deliver the LBB Highway Asset Management Network Recovery Plan (NRP) objectives. The prioritisation process is included at Appendix 1.
2. The application of cost effective whole life cost standardised maintenance design types as detailed in paragraph 2.18 and Appendix 2.

### WHY THIS REPORT IS NEEDED

- 1.1 This report is required to ensure that the Committee is kept informed of the approach to operational delivery of the 5 year highway asset management Network Recovery Plan. It explains the highway asset management best practice concept of whole life costing as the basis for prioritisation of network recovery schemes and selection of whole life cost standardised designs.

### 2. REASONS FOR RECOMMENDATIONS

#### Network Recovery Plan

- 2.1 A presentation was made to the Members Working Group on the 2<sup>nd</sup> October 2014 to explain Highway Asset Management best practice and 'The case for a long term effective long term funding plan'. The LBB network in common with many authorities has an extensive backlog of maintenance works and high levels of customer demand for maintenance.
- 2.2 The discussion highlighted that a strategy is needed that is based on understanding and projecting the long term **whole life costs** for keeping an asset safe and serviceable during its 30-40+ year life i.e. not only the initial construction cost.
- 2.3 The presentation highlighted key factors to be taken into account regarding the toolbox of cost effective Network Recovery Plan footway maintenance treatments to account for whole life costs and recover the backlog:-
  - (i) The current backlog of maintenance requires at least £13m per annum budget expenditure for planned maintenance (roads and pavements) plus annual reactive expenditure. Notwithstanding the current £50m

investment over 5 years this will be very difficult to achieve long term so funding pressures will always exist and maintenance treatments must therefore be affordable. The current 5 year capital funding must be maximised.

- (ii) The size of the footway network across the whole Borough is 3.5 million square metres. In recent years less than 1% of the total surface area of footways has benefited from planned maintenance each year. This has been as a result of a tendency to reconstruct complete lengths of footways at a high average square metre repair cost – typically >>£75/sq.m.
- (iii) This approach resulted in >>99% of LBB footways not receiving any planned maintenance each year despite a significant demand from all wards. As a result LBB has to fund an annual reactive repair budget in excess of £1m for footway repairs to meet its statutory safety requirements. In year 2015-16 with an injection of funding and a changing approach to treatments this percentage has increased to around 4%. **However, the percentage treated needs to be much higher to achieve the necessary network recovery plan as part of the LBB Highway Asset Management Plan.**
- (iv) To significantly increase the surface area of the footway network that is treated will necessitate the use of more affordable and sustainable repair treatment unit rates and more preventative maintenance. Complete reconstruction ‘dig out’ of footways is (a) not necessary and (b) not affordable. Sections of existing footway which remain serviceable and stable will not be replaced in the initial five year plan.

#### Whole Life Costing of Footways

2.4 The primary purpose of the footway is to provide a safe surface for pedestrians to walk on. The ‘definitions’ of safe are dealt with via the Highways Act and Code of Practice guidance and in the LBB Inspection Manual. A system of scheduled safety inspections based on a risk management approach is in place to ensure LBB can apply its’ Section 58 defence if claims are made against the authority. This legal duty applies to LBB’s 3.5 million square metres surface area of footways.

2.5 Paragraphs 2.6 – 2.23 that follow discuss a range of issues and factors that need to be taken into account relating to whole life costs and selection of standardised maintenance designs that are affordable. The standardised details for footway maintenance treatments are included at Appendix 2.

#### Design Suitability

2.6 There are two commonly used construction types for pedestrian footways:-

- concrete paving slabs (various sizes) including concrete modular bricks or blocks
- flexible construction – tarmac/bituminous/asphalt materials

*Numerous styles and combinations of these construction types exist across the UK network and within LBB. This is inevitable given that many footways have been in place for more than 40 years.*

- 2.7 Flexible construction (usually referred to as tarmac/asphalt) unit rates are generally lower than precast concrete slab construction. Unit rates can sometimes be affected by local commercial supply chains. The current LBB LoHAC contract currently, has unusually slightly lower rates for slab constructions when compared to tarmac/asphalt . However, these rates need to be disregarded as the current contractor has advised that the rates as tendered some years ago are not commercially sustainable. An open market re-procurement is needed to obtain a representative cost rate comparison between footway maintenance standard details (Appendix 2) for precast slabs and tarmac that can be applied to the LBB Network Recovery Plan footway programme. Such analysis will include specific network recovery footway treatment standard details that can help LBB achieve the percentage surface area preventative maintenance targets for the next 4 years of the 5 year plan.
- 2.8 A brand new footway, such as those now being built on new developments or regenerations projects, has a design life of 25 years before needing significant resurfacing or reconstruction works. The Authority is legally responsible under the Highways Act for keeping the footway safe and maintenance works will be needed, the level increasing as the footway gets older. The reality of funding levels for highway maintenance is that footways will actually need to be maintained for at least double their design life i.e. more than 50 years. The case for effective funding actually identified that at pre NRP levels of funding and areas being treated each year *“Barnet residents can expect their footways to be resurfaced every 140 years”* due to lack of investment and restrictions of budget.
- 2.9 This legal responsibility necessitates an appropriate customer reporting and inspection regime and a team of people to undertake those inspections and maintain a Section 58 defence for the Authority. The busiest town centre footways are inspected monthly. These inspections generate repair works and the management, inspection and repair costs are part of the whole life costs.
- 2.10 Safety defects in pedestrian footways are mainly caused by damage to the footway from vehicles – cars and vans and heavy goods vehicles driving on the footway or regularly parking on the footways. Another major cause of damage is urban street trees and their root systems. These causes of damage generate a regular need for inspections, member and customer requests for service via the Customer Hub and the web based Report IT

system, and regular instructions to contractors for repair works. All of these have a financial cost. Currently LBB has to make available a reactive annual budget of £1.6m for safety defect repairs of which over £1m is spent on footway repairs. The average cost of a reactive safety temporary defect repair to a localised cracked slab or a pothole is £57 (Annual Local Authority Road Maintenance (ALARM) Survey 2015).

- 2.11 Safety defects also create the potential for claims to be made against the Highway Authority which creates a cost liability for LBB and this is a key part of the whole life costs. The annual financial liability for LBB for highways is on average £670,000 per year with the most expensive claims usually on footways sustained by personal injury. In urban locations such as LBB this cost is a major part of the whole life cost consideration.
- 2.12 The cumulative cost of the initial construction cost plus the total cost of reactive maintenance to the footway together with any claim liabilities during its 25-30 year design life is the **whole life direct financial cost**. The best practice approach is to minimise the whole life cost.
- 2.13 In addition to the direct financial costs are a range of indirect costs not readily measured, but nevertheless important. These include the costs of processing customer service requests and complaints, ad-hoc inspections and investigating and preparing reports to defend insurance claims.

#### Standardised Maintenance Designs

- 2.14 The choice of footway maintenance design has a significant impact on the financial liabilities for a Highway Authority over an extended period of time. Research organisations including the Transport Research Laboratory (TRL) which advises key organisations on maintenance policy and strategy have analysed the relative costs between slabs and flexible construction. The whole life costs for slab construction footways in urban environments were found to be higher due to the increased incidence of repairs and claims.
- 2.15 Concrete slab footways can have many benefits if placed in the right environment but they are not suited to being overrun by cars or heavy goods vehicles which inevitably crack the slabs and damage the underlying foundations causing a weakness that leads to safety defects or a visually unattractive cracked surface whilst still remaining serviceable. They are not suited to narrow footways due to bonding patterns and also footways with trees with growing roots that need to be accommodated. They also do not cope well with being excavated by statutory undertakers laying new services or making repairs. When slabs are laid in locations not well suited such as those described above they can also result in complaints for disability access groups. **Slab construction footways with some or all of these unsuitable**

**characteristics represent a heightened risk to the authority with an increased probability of claims and reactive maintenance costs.**

- 2.16 The role of the Operational Network Hierarchy is also a factor in the choice of repair design as it identifies locations with high pedestrian activity and probability of risk. The hierarchy used in conjunction with the key factors such as footway width, trees in the footway, parking on the footways (whether formal or informal), vehicular crossings to properties and the like will guide the best choice of material to minimise whole life costs and risks. **These factors where present would dictate that a flexible bituminous type footway construction is best suited to long term maintenance and managing the risk of safety defects.** The proposal for flexible tarmac construction can include some form of design that incorporates elements of brick paviours for vehicle crossings or for small areas of decorative features to enhance the visual appearance of the area and improve the cosmetic appearance of the street scene.
- 2.17 A study undertaken in 2006 by the Independent Transport Laboratory (TRL) (appendix 3), modelled the whole life costings, over a forty year period, of bituminous tarmac footways compared with paved footways. When average costs and typical maintenance regimes were used to model the whole life costs, it was discovered that the whole life costs of the bituminous tarmac footway were 77 percent of those of the paved footway. Furthermore, when the estimated costs of accidents and insurance claims were factored into the model, the whole life costs of the bituminous tarmac footway were found to be 52.9% of those of the paved footway.

#### Standardised Designs

- 2.18 Appendix 2 details four standardised types of footway design each of which have their own construction cost, anticipated whole life time cost and other advantages and disadvantages specific their intended locations:

- **Type one: All ASP Paving:**

Although under the current contractual arrangements paving is marginally cheaper to install, it suffers from many disadvantages including: a larger whole of lifetime cost, an incompatibility with urban trees whose roots which rapidly damage the paving, an incompatibility with footway parking, vehicle crossovers and vehicle overruns (due to the inflexible nature of the slabs which are rapidly compromised by the weight of vehicles). Therefore this type is not recommended to Members.

- **Type two: All Asphalt:**

We recommend this type to the Members for residential roads as it offers value for money from an initial cost perspective and although it is slightly more expensive under the current LoHAC contract to install than type one, it requires less whole of life cost maintenance when compared to paving. This type also has other advantages including flexibility which makes it suitable for use with urban trees and vehicle crossings, footway parking and vehicle overruns)

- **Type 3 Asphalt footway with block crossovers and margins:**

This type shares many of the benefits of type two above, however it is the most expensive of the options to install.

- **Type 4 Asphalt footway with block crossovers**

This type also shares many of the benefits of type two and is currently slightly cheaper under the current LoHAC contact rates. Members may therefore want to consider this type as a favourable option for the network recovery plan. However, when the current contract is re-procured this type could become more expensive under new contractual arrangements.

#### Exceptional Enhancements

- 2.19 Whilst the types above will be suitable for the vast majority of residential areas it is recognised that some developments and conservation areas might benefit from enhanced materials which are sympathetic to their environment. This approach will need to be considered carefully on a case by case basis due to the higher capital cost of these materials and the increased revenue cost of maintaining them. As part of the whole life costing decision it is also recognised that the condition and appearance of footways can contribute to the overall image of an Authority helping to support growth, regeneration and people wanting to work and live in the Borough. For this reason the concrete paving slab including concrete brick or block paviour type construction is favoured and suited to the busiest economic town centres. The Operational Network Hierarchy identifies the 22 LBB designated town centres as the highest category of footways and it is these locations where precast concrete slabs are deemed appropriate.

#### Future Arboricultural Policy

- 2.20 Urban street trees and their root systems are a major cause of damage to footways which increases the authority's maintenance burden and exposure to public liability insurance claims. However, this damage can be vastly reduced by an effective tree management plan which involves such measures as tree pits and the careful selection of tree species for when new trees are

planted. A more significant issue is how established mature trees should be managed when it becomes evident they are causing damage to footways. A working group of officers has been established to review these issues and produce a tree policy for the Borough. This policy will aim to reduce the damage caused by trees, but will crucially also recognise the important role that trees play as valuable Borough assets and the numerous benefits they provide for our residents and visitors. It is worth noting that the asphalt footway construction is especially suitable to environments where urban trees are present.

### Conclusions and Proposals

- 2.21 To achieve the LBB Network Recovery long term strategy objectives and best value expenditure necessitates the application of asset management whole life costs principles through cost effective standardised maintenance designs.
- 2.22 The optimum whole life cost footway treatment standard details default to bituminous/asphalt type products as this approach delivers better long term whole life costs and risk management. The full range of standardised footway details and their associated characteristic and benefits is included at Appendix 2.
- 2.23 Designated parts of the LBB operational network hierarchy will continue to be maintained using slab construction. Such locations will be identified in the Developer Design Guide. These will include the 22 designated shopping town centres.

### **3. ALTERNATIVE OPTIONS CONSIDERED AND NOT RECOMMENDED**

- 3.1 Not applicable to this report

### **4. POST DECISION IMPLEMENTATION**

- 4.1 The LBB Highway Asset Management Network Recovery Plan planned maintenance programme will be implemented in accordance with whole life costs principles.

### **5. IMPLICATIONS OF DECISION**

#### **5.1 Corporate Priorities and Performance**

- 5.1.1 The Council's Corporate Plan 2015 – 2020 states in its strategic objectives that it will work with local partners to create the right environment to promote responsible growth, development and success across the borough. In

particular Barnet's local environment will be clean and attractive, with well-maintained roads and pavements and flowing traffic.

## **5.2 Resources (Finance & Value for Money, Procurement, Staffing, IT, Property, Sustainability)**

5.2.1 This policy aims to ensure optimum value for money from expenditure for LBB Highway Maintenance Managed Budgets and the £50 million of funding for the LBB Network Recovery Plan. Detailed financial scheme costs will be included in the relevant yearly planned maintenance works programme report seeking approval from the Environment Committee.

5.2.2 The 5 year Network Recovery Plan for planned maintenance as informed by the Operational Network Hierarchy supports optimum value for money from the expenditure for LBB Highway Maintenance Budgets by providing:-

- cost effective whole life costs (over 20 years) through maintenance treatments suited to the footway conditions, in particular instances of footway parking and vehicle overrun.
- a positive transformation from costly and disruptive reactive maintenance 'patching' to planned maintenance.
- reducing LBB financial risk of insurance claim incidences.

## **5.3 Social Value**

The Public Services (Social Value) Act 2013 requires people who commission public services to think about how they can also secure wider social, economic and environmental benefits. This report does not relate to procurement of services contracts.

## **5.4 Legal and Constitutional References**

5.4.1 Maintaining the highway so as to allow safe passage of traffic is a statutory duty of the local authority under the Highways and Traffic Management Acts. Section 58 of the Highways Act 1980 provides a statutory defence to an action against a highway authority in respect of damage resulting from their failure to maintain a highway maintainable at public expense if the authority had 'taken such care as in all the circumstances was reasonably required to secure that the part of the highway to which the action relates was not dangerous for traffic'. In determining whether the defence applies regard is given to the character of the particular highway and the traffic that might reasonably be expected to use it

5.4.2 The Council's Constitution (Responsibility for Functions, Annex A) gives the Environment Committee certain responsibilities related to the street scene including pavements and all classes of roads, parking provision, and enforcement, and transport and traffic management including agreement of the London transport Strategy Local Implementation Plan.

## **5.5 Risk Management**

5.5.1 The Operational Network Hierarchy that is being used to formulate the

Network Recovery Plan programme is a key element of the risk management approach to highways maintenance and the selection of footway materials base on the use of Whole Life Cycle Costing will ensure that the correct treatments are used to provide best value for money thereby minimising future maintenance costs and future third party claims on newly constructed areas of footways.

## **5.6 Equalities and Diversity**

- 5.6.1 Street design should be inclusive, providing for all people regardless of age or ability. There is a general duty for public authorities to promote equality under the 2010 Equality Act. There is also a specific obligation for those who design, manage and maintain buildings and public spaces to ensure that disabled people play a full part in benefiting from, and shaping, an inclusive built environment.

Designers will be required to refer to Inclusive Mobility, The Principles of Inclusive Design and Guidance on the Use of Tactile Paving Surfaces (1999) in order to ensure that the designs are inclusive.

## **5.7 Consultation and Engagement**

- 5.7.1 The Network Recovery Planned Maintenance programme is subject to suitable advanced and ongoing communications with local members and residents in roads and footways affected by the works. Additional communication and engagement will be undertaken on any changes to existing construction materials and the planned maintenance programme periodically updated and included on the LBB website will include materials types.

## **5.8 Insight**

- 5.8.1 The principle of whole life costs is informed by a significant and ongoing analysis of reactive safety defects, claims and risks.

## **6. BACKGROUND PAPERS**

- 6.1 Case for Effective Funding – Members Working Group 2<sup>nd</sup> October 2014.  
6.2 Environment Committee 27<sup>th</sup> January 2015 – Highways Planned Maintenance Programme.  
6.3 Environment Committee 10<sup>th</sup> November 2015 – Highway Network Recovery Planned Maintenance Programme and LIP and Section 106 2015-16 Q2.  
6.4 Environment Committee 11<sup>th</sup> January 2016 – Highway Network Recovery Planned Maintenance programme and LIP and Section 106 2015-16 Q3.