

## Report of Chief Officer (Highways & Transportation)

### **Report to Scrutiny Board (Infrastructure and Investment)**

### Date: 27 September 2017

### Subject: Highway Asset Management - The Approach To Road Surfacing

Are specific electoral wards affected? If relevant, name(s) of ward(s):	Yes	🛛 No
Are there implications for equality and diversity and cohesion and integration?	Yes	🛛 No
Is the decision eligible for call-In?	Yes	🛛 No
Does the report contain confidential or exempt information? If relevant, access to information procedure rule number: Appendix number:	Yes	No No

### Summary of main issues

- 1. The Best Council Plan sets a priority to deliver quality highways assets, to maintain the percentage of roads in need of structural repair and reduce the percentage of highways structures in need of essential repair.
- 2. Highways Assets in Leeds are continually monitored for condition and maintenance needs. Maintenance and strengthening programmes are developed to maintain the assets in a safe and serviceable condition appropriate for their use together with a view to minimising whole life costs.
- The purpose of this report is to provide Board Members with an overview of the process of selecting which roads are to be resurfaced and the relative value for money of the treatments being used.
- 4. This report also provides an update to Board on the progress with the transfer of the gully cleaning service from Communities and Environment Department to City Development Department.
- 5. Officers from Highways Asset Management and Highway Maintenance have been invited to attend to address any further questions from Board.

### Recommendations

- 6. Scrutiny Board (Infrastructure and Investment) are requested to:
  - i) Note the content of this report
  - ii) Make recommendations as deemed appropriate.

## 1. **Purpose of this report**

- 1.1. The purpose of this report is to provide Board Members with an overview of the process of selecting which roads are to be resurfaced and the relative value for money of the treatments being used.
- 1.2. This report also provides an update to Board on the progress with the handover of the gully cleaning service from Communities and Environment Department to City Development Department.

### 2. Background information

- 2.1. Highways and Transportation have responsibility for maintaining the 2,878km of roads in Leeds and associated infrastructure. The current backlog of road maintenance is £124m and is rising annually by around 4% due to road deterioration and inflation. Funding for all highway maintenance since 2002 is shown in the graph in Appendix A. The total funding for 2017/18 is just over £22m of which £16.7m is capital funding from Leeds own capital (£11m) and government grant (£5.7m) for street renewal.
- 2.2. Around 66% of the available capital budget is spent on carriageway maintenance each year (£11.2m in 2017/18). The remaining £5.5m is used to repair footways and kerbs.

### 2.3. Highways Asset Management

- 2.4. Funding for road maintenance falls short of being able to repair all of the roads that would benefit from maintenance work. The process of asset management and life-cycle planning is adopted to ensure that the funding available delivers the best long-term outcome for the road network as a whole. An explanation of this process is expanded upon in paragraph 3 below.
- 2.5. Government grant makes up around 34% of the budget available for road maintenance in Leeds each year. An element of this grant is awarded on a formula basis proportionate to road length but an increasing proportion is being allocated depending on each authority's adoption of asset management principles and efficiency measures. In 2016 Leeds was assessed in the top performing band for incentive funding and as such has received the maximum grant award available.

### 2.6. Gully cleaning

- 2.7. Cyclic gully cleaning is undertaken to ensure surface water drains from the highway safely. A well-maintained drainage system ensures road safety and prevents premature deterioration of road surfaces. Not all gullies can cope with the heaviest downpours but cyclic maintenance will ensure they work to the best of their ability.
- 2.8. Routine gully maintenance involves the regular emptying of the catch-pit within the gully. Where the cleaning visit reveals a blockage of any kind the gully is referred for a maintenance visit to resolve the problem. These two operations were in different departments which did not result in the most efficient operation. This has now been resolved with Highways and Transportation taking overall responsibility for both gully cleaning and maintenance operations.

## 3. Main issues

### Road Resurfacing

- 3.1. The asset management approach to road resurfacing involves the following processes:
  - Condition surveys and condition banding
  - Life-cycle planning and value for money
  - Treatment selection
  - Delivery and monitoring
- 3.2. Appendices B to E explain the processes in detail.

### Gully Cleaning Service

3.3. A briefing paper on the approach to gully cleaning is included at Appendix F

### 4. Corporate considerations

### 4.1. Consultation and engagement

- 4.1.1. Ward Members are engaged in the development of the annual programme for road maintenance of the local roads within their Ward.
- 4.1.2. The Executive Member for Regeneration, Transport and Planning is consulted on and in agreement with the adopted approach to road surfacing.
- 4.1.3. The annual programme of highway maintenance is a published report with delegated authority of the Chief Officer Highways and Transportation.

### 4.2. Equality and diversity / cohesion and integration

- 4.2.1. Equality and diversity, cohesion and integration is considered and reported fully as part of the development of the annual programme of highway maintenance.
- 4.2.2. Highway maintenance work removes those defects that are likely to be a hindrance to mobility and there is an opportunity to provide improved mobility features such as dropped kerbs where kerbing works are being undertaken.

### 4.3. Council policies and the best council plan

- 4.3.1. The Best Council Plan sets a priority to deliver quality highways assets and to maintain the percentage of roads in need of structural repair.
- 4.3.2. The published Highway Infrastructure Asset Management Strategy reinforces the use of life-cycle planning to achieve the best value outcomes for the council's road network.

### 4.4. Resources and value for money

- 4.4.1. The adoption of asset management practice incorporating life-cycle planning aims to maximise value for money.
- 4.4.2. Collaborative procurement of contractors to deliver road surfacing across WYCA has delivered efficiencies in contract preparation and competitive rates.
- 4.4.3. Combining the gully cleaning operations with the gully repair teams into one service will generate long term efficiencies.

### 4.5. Legal implications, access to information and call-in

- 4.5.1. The Chief Officer (Highways and Transportation) has been delegated the authority to approve the annual programme of highway maintenance as identified in the Constitution, Part 3, Section 3E.
- 4.5.2. This report is not subject to call-in on the grounds that the report is for discussion only at this stage.

### 4.6. Risk management

- 4.6.1. The adoption of both preventative treatments and resurfacing of roads reduces the likelihood of overall deterioration of the road network in Leeds.
- 4.6.2. The use of preventative maintenance treatments significantly increases the number of roads brought back into OK condition each year.
- 4.6.3. The life-cost of preventative treatments presents good value for money.
- 4.6.4. Combining the gully cleaning operations with the gully repair teams into one service will improve coordination of gully maintenance.

### 5. Recommendations

- 5.1. Scrutiny Board (Infrastructure and Investment) are requested to:
  - i). Note the content of this report
  - ii). Make recommendations as deemed appropriate.

### 6. Background Papers<sup>1</sup>

6.1. None.

<sup>&</sup>lt;sup>1</sup> The background documents listed in this section are available to download from the Council's website, unless they contain confidential or exempt information. The list of background documents does not include published works.

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### £13,000,000 £475,000 2002/03 2003/04 2004/05 2005/06 2006/07 2007/08 2008/09 2009/10 2010/11 2011/12 2012/13 2013/14 2014/15 2015/16 2016/17 2017/18 2018/19 2019/20 2020/21 1 ۱ £12,000,000 ۱ ---- Prudential borrowing DfT HM Block Grant 1 £22,049,413 £11,000,000 £5,727,303 £4,611,110 ۱ 1 £711,000 Pothole Grant Leeds Capital ١ Revenue Total CZ0,842,410 £10,000,000 1 1 1 £475,000 i £20,527,110 i £20,215,123 ۱ £10,000,000 £20,460,700 27,500,0067,800,000 £18,782,940 £26,493,640 £10,000,000 £20,705,960 £13,100,000 £26,804,485 £27,848,349 £14,100,000 £6,000,000 £22,368,170 £25,553,000 £20,403,902 1 £22,909,902 £13,452,550 ١ £19,322,670 1 £25,000,000 £20,000,000 £15,000,000 £10,000,000 03 £30,000,000 £5,000,000 noitsoollA

# Leeds Highway Maintenance Funding 2002 to 2021

# Highway Maintenance Funding 2002 to 2021

### Appendix A

Financial Year

5 of 15

### Condition surveys and condition banding

- B1. Condition surveys and condition banding is the process by which the current state of the network is understood and forms the basis for the selection of roads for maintenance.
- B2. For assessment purposes the road network is divided by hierarchy into 3 categories;
  - Classified Roads (A, B or C classification roads) totalling 634km
  - Distributor Roads (unclassified through routes and main distributors) totalling 172km
  - Local Roads (minor, estate and residential roads) totalling 2,072km
- B3. Classified roads are assessed for condition every two years using a machine based survey to meet government reporting standards. Those identified as being most in need of maintenance are assessed in more detail annually.
- B4. Distributor Roads and local roads are assessed by an inspector every four years. Those identified as being most in need of maintenance are assessed in more detail annually.
- B5. The outcome of the assessment results in road condition indicators. The overall condition banding used follows a traffic light system from green (OK condition) through amber to red (poor condition). As roads deteriorate they progress through the banding system from green to red as depicted below. The two areas of most interest for asset management purposes are those in the Red band and the Dark Amber band.



Banding of road condition from Green (OK) to Red (poor)

B6. More detail on the use of the banding system is explained in the life-cycle planning Appendix C.

### Life-cycle planning and value for money

- C1. The concept of life-cycle planning is to gain the best long term benefit in carriageway condition for the least investment. The aim of the highway asset management service is to use the available funding to minimise the number of roads in the Red band.
- C2. To do this there are three options.
  - 1. To resurface as many Red roads as possible each year and hope that the number treated is greater than the number deteriorating into the Red band.
  - 2. To surface treat as many Dark Amber roads as possible each year to minimise the number of roads deteriorating into the Red band. But leave the existing Red roads to get worse.
  - 3. To carry out a combination of the first two options.
- C3. Around 7.6km of Dark Amber roads can be treated for the same cost as 1km of resurfacing a Red road.
- C4. There are approximately 181km of Red condition roads in Leeds. Each year around a further 146km of Dark Amber's would deteriorate into Red condition. With a current maintenance spend of £11.2m per annum, on average, 61km of Red roads could be resurfaced or 301km of Dark Amber roads could receive a preventative maintenance treatment to prevent them from progressing to Red condition.
- C5. With a deterioration rate greater than the number of roads that could be resurfaced each year, option 1 would lead to a growing Red list.
- C6. If all funding was used to undertake preventative maintenance the Red list would not get any shorter and the worst red roads would have to be left.
- C7. Lifecycle planning calculations confirm that option 3 brings about the best outcome for the authority in terms of long term road condition and maintenance costs. The current recommended ratio of resurfacing to preventative maintenance to make the biggest impact on overall road condition is 41km of resurfacing to 66km of preventative maintenance treatment. This scenario is reviewed each year in advance of the preparation of the annual programme.
- C8. With many roads in a fragile state the weather plays a large part in the annual deterioration rate of roads. A severe winter or particularly wet summer accelerates the rate of deterioration which can play a dramatic part in the demands on pothole crews and the preparation for planned maintenance in the following financial year. As a general rule any newly laid treatment should withstand a severe winter but a wet summer may impact on the laying process which may lead to premature failure. More detail is provided in Appendix E, Delivery and Monitoring.
- C9. The diagram on the following page depicts the current maintenance strategy as described above.

### Life-cycle planning and value for money

### Appendix C (continued)



Current maintenance strategy of implementing a mix of preventative maintenance (surface treatment) and structural maintenance (resurfacing) to maximise the effect of investment in road condition.

### **Treatment selection**

### Appendix D

- D1. Treatment selection is based on whole life cost principles as shown in the table on the following page. The table demonstrates the annual cost per square metre based on the expected life of each treatment.
- D2. The design and selection of materials for traditional resurfacing follows the current national best practice for the selection of bituminous and asphalt surface materials for road construction.
- D3. Selection and value for money from preventative maintenance treatments relies heavily on the service life of such treatments.
- D4. The highway authority advisory body, the Association of Directors of Environment, Economy, Planning and Transport (ADEPT) together with the Road Surface Treatments Association suggest that authorities should expect service lives for preventative maintenance treatments of between 10 and 15 years.
- D5. A review of treatments undertaken between 2003 and 2007 in Leeds demonstrates that with few exceptions the treatments undertaken in Leeds are meeting those guidelines. The chart on the page after next shows the detail of the study which is summarised in table D5 below.

Surface treatment	ADEPT expected service life	Leeds actual service Life	
Surface Dressing	10 years	25% of roads treated lasted on average 11.7 years	
Principal Roads		75% of roads treated are still fit for purpose (10-14 years+).	
Surface Dressing	15 years	33% of roads treated lasted on average 13.0 years.	
other roads		67% of roads treated are still fit for purpose (10-14 years+).	
Micro-asphalt	10 years	4% of roads treated lasted on average 11.5 years.	
		96% of roads treated are still fit for purpose (10-14 years+).	

### Table D5 service lives expected and achieved

D6. There are a small number of premature failures, the shortest period at one Microasphalt site being just 3 years. Premature failure is the exception rather than the rule and the reasons for these are discussed in Delivery and Monitoring in Appendix E.

# **Treatment Selection**

# Appendix D Continued

Light to medium trafficked roads (up to 250 commercial vehicles/lane/day)				
Treatment	General conditions for use	Life expectancy of treatment (years)	Average treatment cost	Average cost per m <sup>2</sup> per year of life expectancy
Cost effective treatr	ments:			
Surface dressing	Structural failure of less than 20% of total area and overall ride quality is acceptable.	13	£3.13	£0.24
Resurfacing	Structural failure in excess of 20% or overall ride quality is poor.	20	£23.79	£1.19
Alternative treatments that may be considered where surface dressing is prohibited and annual budgets will preclude resurfacing within the next 5 years.				
Micro asphalt	Structural failure of less than 20% and overall ride quality is average.	11.5	£5.91	£0.51
Shallow depth recycling	Failure of surface layers only (structural failure not evident) where surface regularity is poor over large areas.	12	£8.91	£0.74

Medium to high trafficked roads (over 250 commercial vehicles/lane/day)				
Treatment	General conditions for use:	Life expectancy of treatment (years)	Average treatment cost	Average cost per m <sup>2</sup> per year of life expectancy
Cost effective treatr	ments:			
Surface dressing	Structural failure of less than 20% of total area and overall ride quality is acceptable.	11.7	£4.89	£0.42
Resurfacing	Structural failure in excess of 20% or overall ride quality is poor.	20	£25.00	£1.25
Alternative treatments that may be considered where surface dressing is prohibited and annual budgets will preclude resurfacing within the next 5 years.				
Micro asphalt	Structural failure of less than 20% and overall ride quality is average.	11.5	£5.91	£0.51
Shallow depth recycling	Not appropriate	-	-	-



### **Treatment Selection**

**Appendix D Continued** 

### Delivery and Monitoring

## Appendix E

- E1. Surface treatments are delivered by contractors engaged through a collaboration contract with the other five district authorities within the West Yorkshire Combined Authority. This contract arrangement has increased competition and the potential for efficiencies to ensure value for money for all of the West Yorkshire district authorities.
- E2. The two contracts for surface treatments include:
  - a. Surface Dressing
  - b. Micro-asphalt.
- E3. The contractor is required to undertake the specific design mix of the treatment to be used at any one location. The treatments are weather dependant and are therefore seasonal contracts undertaken in the summer months. Micro-asphalt is more tolerant of weather than surface dressing and can be undertaken over an extended seasonal period.

### Guarantee

- E4. The contractor is required to provide a 2 year guarantee for their product.
- E5. There can be much debate around guarantee periods and whether 2 years is adequate for these materials. Experience shows that in the majority of cases defects that will affect the long term performance of the product will be evident within the first two years of use. Defects that appear after that time are rarely due to poor material or workmanship. If the guarantee were to be extended it is likely that the contractor's rates will increase across all sites to cover the extended risk. In reality the level of failures within 3 to 5 years remains very low and the increased cost to the authority of that assurance is unlikely to represent value for money.

### **Reasons for premature failure**

- E6. As noted in Appendix C, only a small number of sites experience premature failure. The usual causes of failure and their mitigation are listed below:
- E7. Incorrect design of material; most material is similar in nature and designed and installed by competent certified contractors. This mode of failure is rarely experienced but can occur for example if a batch of chippings has not been properly cleaned. Some authorities source their own chippings for contractors to use. The WYCA contract requires the contractor to supply all materials with certified industry standard quality control.
- E8. Incorrect preparation of works; contractors are keen to ensure the material does not fail within the guarantee period or present loss of reputation. More often than not the contractor will report to the council any site that they are unable to prepare properly such as a loose or uneven surface or standing water and may even refuse to apply their material.
- E9. Inclement weather conditions; this can be the biggest cause of failure especially during erratic summer shower periods. The specification for works includes allowable operating temperatures and weather conditions that are adhered to by the contractors and enforced by the council.
- E10. Poor workmanship; the contractors employed by the council are members of the Road Surface Treatments Association and certified to the National Highway Sector Scheme 13 for the supply and application of surface treatments to road surfaces.

### Monitoring and aftercare

- E11. Highways and Transportation employs Contract Engineers and Monitoring Officers to manage all highway maintenance contract operations including the surface treatment programme.
- E12. The contractors are supervised during the laying operations. Completed work is visited periodically thereafter and every site is assessed prior to the termination of the guarantee period.
- E13. The design of the surface dressing process includes an element of excess chippings to assist with the embedment process in the early life of the treatment. Surface dressing is swept to remove loose chippings after 24 hours and again within one week.

### Repairs

E14. As a general rule if repairs are required under the guarantee the contractor will return to repair any routine defective areas the season after the expiration of the guarantee period. Any urgent repairs will be completed by the contractor as soon as identified or by the council with costs being charged to the contractor.

### End of life

- E15. At the end of their useful life, surface treatments will present the following characteristics:
- E16. Surface dressing; either loss of chippings, excessive embedment or loss of binder adhesion, bringing an excess of bitumen or to the surface or uncovering the old road surface. The result can be a loss of waterproofing and/or reduction in skidding resistance which can be rectified with a further surface dressing treatment. A carriageway can be surface dressed around three times before considering replacement of the road surface.
- E17. Micro-asphalt; can either wear through evenly or lose adhesion and break away in localised areas. Even wear can be rectified by a further application. Localised loss of adhesion will result in an uneven surface with depressions equal to the thickness of the material layer of between 5 and 20mm. This is not considered to be a hazard but can be an uncomfortable ride quality. Rectification can be by patching or by removing the top layer completely followed by a further application.

### Gully cleaning service

### Introduction

- F1. The responsibility for gully cleaning transferred from Communities and Environment Department to City Development Department on 5<sup>th</sup> July 2017. The service includes cleaning in excess of 145,000 gullies and over 42 kilometres of linear drainage (kerb drainage or channels with grill or slots). The responsibility for physical maintenance of gullies remains with City Development
- F2. The rationale for the transfer of the service is to align the cleaning and maintenance of road gullies in one service to create a more joined-up service with the ability to realise long term efficiencies.
- F3. The service operating budget for five tankers and associated operatives has transferred to City Development. The transfer does not include supervisory staff.

### Transfer service levels

- F4. Gullies were aimed to be cleaned every 8 months irrespective of location or priority with a paper based recording system.
- F5. Electronic recording devices (Kaarbontech Gully Smart) were introduced in July 2016 to record gullies cleaned and the amount of silt in each gully catch pit. This has assisted in monitoring operational performance and will assist in the future development of risk based frequencies of cleaning.
- F6. As part of the transfer of the service and in order to fully assess the state of the gully asset it has been agreed to service every recorded gully at least once by July 2018. The detail of this assessment will allow the future design of an efficient system based on the needs of each gully in terms of future cleaning frequencies. The repeated cleaning of the higher frequency 'at risk' locations will continue during this period.

### Revised service level and risk assessment

- F7. As the service moves away from a standard frequency for all gullies irrespective of their cleaning need to a more risk based approach, the following frequencies will be adopted.
- F8. Clean gullies every six months in the areas identified by Flood Risk Management as ones that are within a 30 year flood risk area. Monitoring of silt levels will be undertaken and in the event of gullies being more than 75% full their frequency will be enhanced to 3 monthly. Any with silting less than 25% will be reduced to 12 monthly.
- F9. Clean gullies that have been identified on the resilient network (principal roads and links to emergency services, and economic links between communities) every twelve months. Monitoring of silt levels will be undertaken and in the event of gullies being more than 75% full their frequency will be enhanced to 6 monthly. Any with silting less than 25% will be reduced to 24 monthly.
- F10. All remaining gullies will be cleaned once by July 2018. Similar monitoring to the other two categories will be undertaken and adjusted accordingly.

### F11. It is anticipated that this regime will result in:

Gully Cleansing Frequency	Number of Gullies	Frequency per Year	Gullies per year
Every 6 months	4830	2	9660
Every 12 months	15980	1	15980
Every 24 months	123600	0.5	61800
Totals	144410		87440

Anticipated service levels after risk assessment

### Member and other service requests

F12. Member and other service requests will continue to be dealt with in line with inherited procedures. Future developments are under discussion to streamline the existing process and deliver further improvements.

### **Current Progress**

F13. Progress to the end of June 2017(one year since the adoption of the gully management system) is shown in the table below

Of the 144,410 Gullies		
94,900	Attended.	
of which:		
82,018	Cleaned and working as planned.	
9,319	Inaccessible due to parked cars (at least two visits) or require traffic management.	
3,563	Blocked and referred to maintenance team. of which 1,719 Repaired by maintenance teams. 1,844 Awaiting repair.	
Overall of	those attended	
86%	Cleaned and running at first visit.	
10%	Unable to access or require traffic management.	
4%	Found to be blocked. of which 2% Repaired 2% Awaiting repair	