

Poole Challenge Fund Bid

HMAT Modelling Technical Note

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Prepared by

Resan Santhakumar, Tom Diver and
Karl Hounsell

Mouchel Ltd
Export House
Cawsey Way
Woking
Suffolk
GU21 6QX
UK

T +44 (0)1483 731000

F +44 (0)1483 731003

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1 Introduction

This note sets out the methodology behind the Highways Maintenance Appraisal Tool (HMAT) for the assessment of increased spending on maintenance on the highway network in Poole. The sections that follow relate to the inputs and assumptions that have been used for each of the input tabs in the HMAT spreadsheet model. The output from the core HMAT run can be found in Appendix J.

1.1 Road Section Details

The 15 link sections included in the bid are shown in the following table.

Road Section Code	Road Name	Total Section Length (m)
A35/829	A35 Wimborne Road - Sect 833 to Fleetsbridge R/A DCW	76
A35/831	A35 Wimborne Road - Fleetsbridge R/A to Sect 833 DCW	80
A35/833	A35 Wimborne Road - End of DCW to Fernside Rd	1,145
A341/845	A341 Magna Road - Queen Anne Drive to Boundary	2,597
A341/805	A341 Queen Anne Drive - Gravel Hill to Magna Road	1,525
A3040/805	A3040 Alder Road (Wallisdown Road to roundabout)	415
A3040/851	A3040 Alder Road (Roundabout to Herbert Avenue)	343
A3040/868	A3040 Alder Road (Herbert Avenue to Ashley Road)	760
B3068/804	B3068 Blandford Road (Poole Boundary to Dawkins Road)	1,112
B3068/805	B3068 Blandford Road (Dawkins Road to Lake Road)	420
B3068/806	B3068 Blandford Road (Lake Rd to Tuckers Lane)	738
B3068/807	B3068 Blandford Road (Tuckers Lane to Bridge Approach)	889
B3068/888	B3068 Ringwood Road (Old Wareham Rd to Seaview Rd)	843
B3093/880	B3093 Wimborne Road (Fernside Rd to Serpentine Rd)	1,094
B3093/884	B3093 Wimborne Road (Serpentine Rd to George R/A)	128

Table 1-1: Road Sections included in the bid

All road sections are classified as urban and there are 8 'A' road and 7 'B' road sections totalling 6.941km and 5.369km in length respectively. Therefore, the total scheme length is 12.165km of which 54% is classified as urban 'A' road and 46% is classified as urban 'B' road.

Based on detailed asset management records held by Poole, the average lane width of the urban 'A' road sections is 10.05m and the average width of the urban 'B' road sections is 9.93m.

The Borough of Poole undertakes SCANNER (Surface Condition Assessment of the National Network of Roads) surveys bi-annually in each direction along their entire road network. Based on the combined results of the 2015 and 2016 SCANNER surveys, the initial condition bands of the road sections included in the bid are shown in Table 1-2.

Road Type	Initial Road Condition Band				
	Very Good	Good	Fair	Poor	Very Poor
Urban 'A' Road	9%	43%	34%	13%	1%
Urban 'B' Road	30%	38%	22%	9%	1%

Table 1-2: Initial condition band of road sections included in the bid

1.2 Traffic Data

Traffic data, collected on a daily basis for the whole of 2016, was obtained from automatic traffic counters on all road sections, except for section B3068/888 where data was provided from a manual count which was factored into a 24 hour count and adjusted to match an annual 2016 count from an automatic traffic counter on a nearby section of Old Wareham Road. This data is presented in Table 1-3.

Road Section Code	Average 2016 Daily Flow (vehicles)					
	Cars	LGV	OGV1	OGV2	PSV	Total
A35/829	8,649	1,208	742	18	119	10,736
A35/831	8,013	1,119	526	15	117	9,790
A35/833	16,661	2,328	1268	33	236	20,526
A341/845	13,293	1,857	254	285	71	15,760
A341/805	13,293	1,857	254	285	71	15,760
A3040/805	16,083	2,247	228	225	239	19,022
A3040/851	16,083	2,247	228	225	239	19,022
A3040/868	16,083	2,247	228	225	239	19,022
B3068/804	13,894	1,941	208	147	129	16,319
B3068/805	13,894	1,941	208	147	129	16,319
B3068/806	13,894	1,941	208	147	129	16,319
B3068/807	5,655	790	116	312	120	6,993
B3068/888	19,827	2,770	288	232	101	23,218
B3093/880	11,624	1,624	91	58	374	13,771
B3093/884	11,624	1,624	91	58	374	13,771

Table 1-3: Average 2016 daily flow data for each road section

The 2016 annual average daily flow (AADF) across the 8 urban 'A' road and 7 urban 'B' road sections was calculated, weighted by section length. These two AADF values were then annualised and multiplied by total section length to obtain an estimate of the annual vehicle kilometres travelled along the road sections included in the bid.

Road Section	Cars	LGV	OGV1	OGV2	PSV	Total
Urban 'A' Road Annual veh-km (000)	36,348	5,078	1,074	568	345	43,413
Urban 'B' Road Annual veh-km (000)	24,632	3,441	339	320	344	29,077

Table 1-4: Average 2016 annual veh-km travelled on road sections included in the bid

To calculate traffic levels in future years, the 2015 Regional Traffic Forecasts for the South West area were utilised to obtain annual growth rates for each vehicle type.

1.3 Base Vehicle Speeds

Vehicle speeds for A and B roads have been allocated according to vehicle type with all being set to 30mph reflecting the urban road category.

1.4 Appraisal Period

A 15 year appraisal period has been selected as this reflects the expected additional lifespan the planned interventions will provide. This represents a conservative approach, compared with the standard 60 year appraisal period.

1.5 Treatment Strategies

There are two treatment strategies.

1.5.1 Do Minimum Treatment Strategy

The Do Minimum scenario prioritises spending to keep the road network in an acceptable condition with treatments outlined in Table 1-5 below.

Scenario	Treatment	Condition Band	% of Road Sections Treated
Do Minimum	100mm Moderate Inlay	Poor	5%
		Very Poor	10%
	40mm Thin Inlay	Poor	5%
	Micro Asphalt	Poor and Very Poor	5%
	Surface Dressing	Fair	5%
	Planned Patching	Poor	5%
	Sealing	Fair	5%

Table 1-5: Do Minimum treatment strategies

This Do Minimum treatment strategy is assumed to apply for each year of the 15 year appraisal period if funding is not granted.

The estimated Borough of Poole typical annual budget for surface treatments across all its roads, excluding skid resistance and drainage, is £880,000 per year. Given their current maintenance backlog, this budget will be predominantly spent on maintaining their 81.70 km of A and B roads. Based on this assumption and given that the total road length of the scheme is 12.17 km, it was established that the pro-rata annual budget for surface treatments for the road sections included in the bid is £131,000. Therefore, in the Do Minimum scenario, an annual budget of £131,000 is assumed and Table 1-6 shows the allocation of this budget by treatment type.

Treatment Type	Do Minimum Budget Allocation
100mm Moderate Inlay	46%
40mm Thin Inlay	23%
Micro Asphalt	11%
Surface Dressing	11%
Planned Patching	5%
Sealing	4%

Table 1-6: Do Minimum budget allocation by treatment type and road section category

1.5.2 Do Something Treatment Strategy

The second treatment strategy reflects the Do Something scenario that assumes funding is granted and, therefore, in the 2017/18 financial year all the road sections included in the bid will have a 40mm thin inlay treatment applied except for road sections A3040/805, A3040/851, B3068/805 and B3068/806 which will have a 100mm moderate inlay applied. Including a 5% level of risk, the Do Something scenario requires a total 2017/18 budget of £3,374,279 with 79% of this budget allocated to undertake the 40mm thin inlay treatments and the remaining 21% allocated to undertake the 100mm moderate inlay treatments.

Once treated as above, given the maintenance priorities for Poole and expectations of the frequency of maintenance interventions for recently treated roads, an annual maintenance budget of £13,000 is assumed for these road sections for ongoing maintenance in the rest of the appraisal period. This is equivalent to 10% of the pro-rata annual maintenance budget assumed in the Do minimum.

In addition to the above treatments, the Do Something scenario also includes the construction of a two sections of cycleway. A 1.3 km section of cycleway on section A341/845 and a 1.4 km section of cycleway on section A341/805. The estimated cost of these two cycleways, including a 5% level of risk is £97,519.

1.6 Transition Matrices

The default transition matrix settings used in HMEP tool are used in this assessment.

1.7 Treatment Effects and Costs

Table 1-7 shows the effect of each treatment on the road section, based on the experience of the Borough of Poole with the benefits that each type of treatment bring depending on initial condition band of the particular road section being treated. These effects are broadly similar to the default values contained in the HMAT. It should be noted however that, whilst the HMAT tool requires costs for all treatment types, in reality a poor or very poor road will not be sealed.

Treatment Type	Initial Condition Band of Road Section				
	Very Good	Good	Fair	Poor	Very Poor
100mm Moderate Inlay	Very Good	Very Good	Good	Fair	Fair
40mm Thin Inlay	Very Good	Very Good	Good	Fair	Fair
Micro Asphalt	Very Good	Very Good	Good	Fair	Fair
Surface Dressing	Very Good	Very Good	Good	Fair	Poor
Planned Patching	Very Good	Good	Good	Fair	Poor
Sealing	Very Good	Good	Fair	n/a	n/a

Table 1-7: Effect of Treatment

Table 1-8 below shows the cost per square metre of each treatment type, based on the initial condition band of the road section being treated. These rates are based on historical scheme data from the Borough of Poole. The increase in rates for the poor and very poor road sections reflects the additional preparation work together with the extra time and material required.

Treatment Type	Treatment Cost in £ per square metre				
	Very Good	Good	Fair	Poor	Very Poor
100mm Moderate Inlay	29.40	31.50	40.95	40.95	64.73
Thin 40mm Inlay	19.95	19.95	23.10	27.30	39.90
Micro Asphalt	6.83	6.83	6.83	8.38	8.67
Surface Dressing	3.73	3.73	3.73	5.79	5.79
Planned Patching	35.58	35.58	35.58	35.58	35.58
Sealing	1.52	1.52	1.52	1.52	1.52

Table 1-8: Treatment Costs (£/m²)

1.8 Treatment Emissions Levels

Based on the default settings within the HMAT, the level of emissions per square metre of coverage for each of these treatment types is shown in Table 1-9.

Treatment Type	Code	Kg CO ₂ / m ²
100mm Moderate Inlay	MI	9.69
40mm Thin Inlay	TI	6.29
Micro Asphalt	MA	3.62
Surface Dressing	SD	0.90
Planned Patching	PA	0.90
Sealing	SE	0.90

Table 1-9: Emission level by treatment type

1.9 Condition Band to IRI Tables

HMAT default values have been used.

1.10 Activity Type and Maintenance Drivers

The works activities are assessed under condition analysis category “carriageway” as the works focus on improving the carriageway condition. It should be noted that any potential skid reduction benefits arising from the treatments are not included and so these potential safety benefits of the scheme will be ignored, thereby reducing the overall potential scheme benefits.

The HMAT default vales for the maintenance drivers are used, as shown in Table 1-10.

Activity Type	Safety	Accessibility	Condition	Reliability	Customer Service	Environment
Structural	15%	0%	65%	0%	10%	10%

Table 1-10: Maintenance drivers

1.11 Performance Targets

Performance targets are not used in this analysis.

1.12 Treatment Impacts

1.12.1 Closure Split and Output Rates

Closure splits and output rates are based on data provided by the Borough of Poole, based on their previous experience.

24 Hour Closure	Off Peak Closure	Night Closures
0%	45%	55%

Table 1-11: Maintenance Closure Split

Surface Dressing	Micro Asphalt	40mm Thin Inlay	100mm Moderate Inlay	Sealing	Patching
443.00	457.00	200.00	135.00	903.00	5.00

Table 1-12: Output Rates (m²/hour)

1.12.2 Carbon Cost

The default setting 'Central' is used.

1.12.3 Road Conditions Impacts

Default values have been used for road condition impacts.

1.12.4 Job Impacts

Default values have been used for job impacts.

1.13 Accident Rates

Accident benefits resulting from the scheme have not been assessed as the works focus on improving the carriageway condition. It should be noted that any potential skid reduction benefits arising from the treatments have not been included and so these potential safety benefits of the scheme have been ignored, thereby reducing the overall potential scheme benefits.

2 Appraisal Results

2.1 Quantitative Impacts

The results from the HMAT are presented in Table 2-1. To conform to WebTAG, these results exclude valuations relating to GVA uplift from jobs and embedded carbon. It should be noted that the Present Value of Costs, presented below, differs from the HMAT output as it also includes the discounted cycleway construction cost of £77,000.

	15 Year Appraisal
Present Value of Costs (£k)	1,788
Present Value of Benefits (£k)	11,703
Net Present Value (£k)	9,915
BCR	6.55

Table 2-1: Cost Benefit Analysis

The table shows that the scheme generates a BCR of **6.55** which demonstrates **very high** value for money.

2.2 Qualitative Impacts (Economic)

This section considers, where applicable, the economic impacts of the proposed scheme. This is a qualitative assessment and the impacts have not been monetised. It covers the impacts set out in **Appendix J**. This is considered a proportionate approach, in view of the scale and complexity of the scheme. The following impacts are considered:

- Business users and transport providers;
- Reliability impact on business users;
- Regeneration; and
- Wider impacts.

2.2.1 Business users and transport providers

The HMAT results indicate an £823,000 saving in value of time across all users as a result of the works. This shows that the proposed scheme will deliver significant travel time savings for business users and transport providers travelling on Poole's local highway network. The improvements to the highway infrastructure and removal of surface defects will ensure that connections between key economic centres,

regeneration sites and residential areas are resilient and efficient and will remain so in the long term. Incidents of road closures due to accidents or weather events, particularly on the A341, are also likely to reduce, improving the overall capacity of the network to maintain its strategic and important role within the local and regional economy.

At this stage, an overall assessment of **Beneficial** has been given.

2.2.2 *Reliability impact on business users*

The £823,000 value of time saving indicates that there will be a reduction in the variability of journey times throughout Poole's local highway network as a direct result of the scheme. This will improve journey time reliability for business users and commuters, and ensure that the highway network does not act as a barrier or deterrent to developments or economic growth in the future.

At this stage, an overall assessment of **Beneficial** has been given.

2.2.3 *Regeneration*

One of the primary aims of the proposed scheme is to improve accessibility to important regeneration sites within Poole, as stipulated by local planning policy (see **Appendix D**). The scheme will provide accessibility improvements to the Port of Poole, Poole Regeneration Area (located between the Back Water Channel and Poole Bridge) and North Poole Employment Land. In particular, it is forecast that development at the Port of Poole could generate 2,100 jobs up to 2021. The Poole Regeneration Area is also a major regeneration scheme on the south coast and is forecast to deliver up to 4,600 jobs up to 2021.

Accessibility will be improved to these regeneration sites, providing a high quality local highway network which also supports connections to the A31 on the Strategic Road Network. By alleviating current pressures on this highway network, due to its generally poorly maintained condition, the scheme has the potential to support future economic growth.

At this stage, an overall assessment of **Slight Beneficial** has been given.

2.2.4 *Wider impacts*

By improving a number of key routes on the local highway network, the scheme will have wider, positive impacts for the Port of Poole. The Port is a regionally significant feeder port, capable of handling tourist cruise ships and international freight. Therefore, there are significant movements of people and freight between the Strategic Road Network (A31) and Port area. An improved local road network, particularly on the B3068 Blandford Road, will support the Port's continued operation

as a significant element of the regional economy. These improvements will also assist to attract businesses to the Poole Regeneration Area. Furthermore, improvements to the A341, A3040 Alder Road and B3068 Ringwood Road, all of which extend into Bournemouth, will provide better quality and more attractive routes for those residents and businesses located on the border between the two towns.

At this stage, an overall assessment of **Slight Beneficial** has been given.

2.3 Qualitative Impacts (Environmental)

This section considers, where applicable, the environmental impacts of the proposed schemes. This is a qualitative assessment and generally covers the impacts set out in *TAG Unit A3: Environmental Impact Appraisal* and **Appendix J**. The impacts have not been monetised. This is considered to be a proportional appraisal approach in view of the scale and complexity of the scheme. It considers the following impacts:

- Noise;
- Air Quality;
- Greenhouse gases;
- Landscape;
- Townscape;
- Historic Environment;
- Biodiversity; and
- Water Environment.

2.3.1 Noise

In general, there will be minimal to no exceedance to current levels of noise during the construction phase of the scheme as appropriate mitigation measures will be enforced. Post-construction, the scheme will allow for smoother and more reliable flows of traffic with reductions in incidences of braking, accelerating and engine noise, as vehicles are not forced to manoeuvre potholes or damaged highways.

It is anticipated that dwellings in the vicinity of the highways to be maintained will benefit from reduced noise pollution as surface defects are removed, which will also reduce incidences of vibrations.

At this stage, an overall assessment of **Slight Beneficial** has been given.

2.3.2 Air Quality

The HMAT results indicate an £64,000 saving in carbon (from fuel) values as a result of the works. In addition, there are no Air Quality Management Areas designated within or near to the scheme area. However, the Borough of Poole currently monitors and manages a number of nitrogen dioxide (NO₂) diffusion tubes in Poole, one of which is located on the B3068 Blandford Road (approximately 200m south-east of the railway bridges), a key component of the bid. Table 2-2 shows that the annual average NO₂ concentration level on Blandford Road is comfortably below the national acceptability threshold of 40µg/m³.

Tube Location	Concentration of Nitrogen Dioxide (µg/m ³)					
	2010	2011	2012	2013	2014	2015
Blandford Road	23.4	21.7	19.2	26.7	23.6	26.7

Table 2-2: B3068 Blandford Road NO₂ diffusion tube analysis

The improvements to journey reliability and comfort due to the scheme are also expected to produce benefits to air quality.

However, at this stage, an overall assessment of **Slight Beneficial** has been given, which is considered to be conservative.

2.3.3 Greenhouse Gases

It is anticipated that the proposed scheme will reduce the emission of greenhouse gases by delivering improved highways throughout Poole's local highway network, as well as increasing cycle provision on the A341. The provision of this cycleway will encourage the use of this travel mode as a preferred option for short trips and would bring about reductions in emissions.

At this stage, an overall assessment of **Neutral** has been given, which is considered to be conservative.

2.3.4 Landscape

Natural England consider works within a 2 km boundary of any designated site to have the potential to affect interest features for which the site was designated for. Whilst highway maintenance to the B3068 Blandford Road and A341 Queen Anne Drive / Magna Road falls within this 2 km boundary, there will be no direct impacts to any designated sites. Appropriate mitigation measures, put in place prior to any works, will ensure that no negative impacts are realised. Therefore, despite the proximity to sites designated with environmental importance, no negative impacts are expected because of the overall scheme.

At this stage, an overall assessment of **Neutral** has been given.

2.3.5 *Townscape*

All scheme works will be carried out within public highway boundaries, which are currently managed and maintained by the Borough of Poole. Therefore, no negative impact is anticipated on the townscape as a result of the overall scheme. Further to this, the provision of a cycleway on the A341, as well as appropriate vegetation where necessary, is considered to enhance the general townscape of that area.

At this stage, an overall assessment of **Slight Beneficial** has been given.

2.3.6 *Historic Environment*

All scheme works will be carried out within public highway boundaries, which are currently managed and maintained by the Borough of Poole. Therefore, no negative impact is anticipated on the historic environment as a result of the overall scheme.

At this stage, an overall assessment of **Neutral** has been given.

2.3.7 *Biodiversity and Water Environment*

There will be no negative impact to biodiversity as a result of the overall scheme. The main impact to the water environment is related to the level of flood risk on the A341. A small section of the highway is in an area designated as flood zone 3, in which there is a 1% (1 in 100) or greater chance of a flooding event occurring each year. In fact, the highway has flooded, on average, three times in the past five years and has been forced to close for a period of time as a result. The scheme will implement drainage improvements on the A341 in order to help remove surface runoff at a quicker rate than in the current situation. Whilst there is no impact on the water environment because of this, there will be an expected benefit to users of the A341, as incidences of closure due to flooding are reduced in the future.

At this stage, an overall assessment of **Neutral** has been given, which is considered to be conservative.

2.4 **Qualitative Impacts (Social)**

This section considers, where applicable, the social impacts of the proposed scheme. This is a qualitative assessment, although it generally covers the impacts set out in *TAG Unit A4-1: Social Impact Appraisal* and **Appendix J**. The Borough of Poole considers this bespoke approach to be proportionate in view of the scale of the scheme. It considers the following impacts:

- Physical activity impacts;
- Journey quality impacts;
- Accident impacts;

- Security impacts;
- Accessibility impacts;
- Severance impacts;
- Personal affordability impacts; and
- Option values and non-use values impacts.

2.4.1 *Physical activity*

The proposed scheme implements the provision of a new cycleway on the A341, which will deliver a safer, direct and more attractive level of transport infrastructure for this travel mode compared to the current situation. Considering a conservative growth rate of 20%, as stated in the Bournemouth, Poole and Dorset LTP3 (2011-2026), the number of cycle trips on this section of the network is anticipated to grow from 129 trips per day to 155 trips as a result of the scheme. Therefore, levels of physical activity associated with this growth are anticipated to increase.

At this stage, an overall assessment of **Slight Beneficial** has been given.

2.4.2 *Journey quality*

The proposed scheme will enhance journey quality for road users as significant sections of Poole's local highway network are improved. The removal of surface defects, such as potholes and patches, will improve the comfort experienced by users of all transport modes, as well as users' perception of safety, reducing the risk of accident associated with poorly maintained highways. It is anticipated that the improvements to drainage on the A341 will reduce the incidences of road closure due to flooding, improving the reliability of journey times, and therefore, overall journey quality to all users.

At this stage, an overall assessment of **Slight Beneficial** has been given, which is considered to be conservative.

2.4.3 *Accidents*

It is anticipated that the proposed scheme will provide significant accident savings on Poole's local highway network, however, these have not been quantified as part of the overall business case. The improvements to the highway infrastructure on key strategic routes in Poole, which carry high volumes of vehicles on a daily basis, will reduce the number of accidents that occur on an annual basis.

At this stage, an overall assessment of **Slight Beneficial** has been given, which is considered to be conservative.

2.4.4 *Security*

By improving the reliability of journey times and reducing frequencies of stopping, the proposed scheme will reduce the risk of crime associated with road users on the highway.

At this stage, an overall assessment of **Slight Beneficial** has been given.

2.4.5 *Accessibility*

The proposed scheme will provide accessibility improvements throughout Poole, but particularly towards the Port of Poole, Poole Regeneration Area and North Poole Employment Land. This will be delivered through the provision of better quality transport infrastructure on the key routes towards these areas, improving journey time reliability and quality. This will enable development opportunities to be brought forward, which in the longer term, will assist local economic growth.

At this stage, an overall assessment of **Slight Beneficial** has been given.

2.4.6 *Personal affordability*

The scheme will not materially affect the affordability of transport for different groups in society.

At this stage, an overall assessment of **Neutral** has been given.

2.4.7 *Severance*

Whilst the proposed scheme will not materially affect severance within Poole, it should be noted that the provision of the cycleway on the A341 will deliver a safe and direct route for this mode of transport and will 'tie-in' with the cycleway enhancements recently provided on the A349 Gravel Hill through Local Growth Funding.

However, at this stage, an overall assessment of **Neutral** has been given, which is considered to be conservative.

2.4.8 *Option values and non-use values*

The scheme will not substantially change the availability of public transport services within the scheme area.

At this stage, an overall assessment of **Neutral** has been given.

3 Sensitivity Tests

Several sensitivity tests have been carried out to provide a more detailed assessment of the benefits for the scheme. The tests carried out are listed below:

1. Sensitivity test 1 – Assumption of 0% risk;
2. Sensitivity test 2 – Assumption of 15% optimism bias;
3. Sensitivity test 3 – 30 year and 60 year appraisal period;
4. Sensitivity test 4 – Assumption of zero traffic growth over the appraisal period; and
5. Sensitivity test 5 – Use original HMAT values of time.

3.1 Test 1 – 0% Risk

This test assumes that the estimated cost and outturn costs are the same, therefore the extra 5% included for risk will not be necessary.

3.2 Test 2 – 15% Optimism Bias

This test allows us to understand how robust the scheme is by testing with costs at a higher level.

3.3 Test 3 – 30 year and 60 year analysis period

Looking at the longer term analysis, we can relate to being able to maintain the network in a better condition than would be possible without the funding. It should be noted that in the Do Something scenario, after assuming an annual maintenance budget of 10% of the annual Do Minimum maintenance budget for the initial 15 years of the appraisal, the full annual Do Minimum maintenance budget of £131,000 is assumed for the remainder of the appraisal period.

3.4 Test 4 – Assume zero traffic growth

This test assumes that traffic remains at 2016 levels. This will mean that fewer vehicles will benefit from improvements to the network in terms of reduced journey times and vehicle operating costs. It also means that there are fewer vehicles inflicting 'wear and tear' on the network which will prolong the benefits of the scheme.

3.5 Test 5 – Use previous values of time

The Department for Transport recently released (March 2017) updated values of time. A sensitivity test was conducted to assess the impacts of these changes by

using the old values of time (January 2014) contained within the original version of the HMAT.

3.6 Results

Table 3-1 presents the results of the sensitivity tests outlined above.

	Base Assessment	Test 1	Test 2	Test 3		Test 4	Test 5
				30 Years	60 Years		
Present Value of Costs (£k)	1,788	1,652	2,200	1,723	1,729	1,788	1,788
Present Value of Benefits (£k)	11,703	11,599	11,989	15,649	17,864	11,694	11,857
Net Present Value (£k)	9,915	9,947	9,789	13,926	16,135	9,906	10,069
BCR	6.55	7.02	5.45	9.08	10.33	6.54	6.63

Table 3-1: Sensitivity test results

The table shows that in all five sensitivity tests the BCR remains in the very high category.

As expected, a decrease in the level of risk is accompanied by an increase in the BCR and an increase in optimism bias is accompanied by a decrease in the BCR of a similar magnitude.

Due to the low growth forecasts in the base model, the effect of reducing growth to zero is negligible. Similarly, the effect of using the old values of time from the original version of the HMAT also has a negligible effect.

Increasing the appraisal period, however, yields a significant increase in BCR, which suggests that the scheme will bring longer term benefits by improving the quality of the network.

4 Summary

This document presents results from the HMAT analysis undertaken for the Poole Challenge Fund bid. The tool calculates the economic impacts of the proposed highways maintenance scheme.

The BCR calculated for the 15 year appraisal period shows that the investment offers very high value for money, with a BCR of 6.55.

In line with WebTAG guidance, these results exclude valuations relating to the GVA uplift from jobs and embedded carbon.

Sensitivity tests have been conducted to assess the impacts of changes to optimism bias, risk, traffic growth and the appraisal period. All five sensitivity tests show BCR's all still representing a **very high** value for money.

To conclude, the HMAT modelling has shown that investing in the scheme will represent a **very high** level of value for money.