



Strategic Approach to Investment in the Highway Asset

September 2013

A report by the Highways Executive Task and Finish Group

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Foreword

Over the last few years West Sussex has experienced some of the worst weather conditions in living memory, from record levels of rainfall, flooding, freezing conditions and snow. This has had an extreme impact on the condition of our roads, manifesting itself in a proliferation of potholes and other defects, along with damage to the substructure and surface of the roads.

Our Highways Department have been engaged in exploring various long term strategic options on how best to maintain our highway network in the light of the damage our network has suffered recently.

The Cabinet Member for Highways and Transport commissioned the cross-party Highways Executive Task and Finish Group (TFG) to examine, challenge and report on these strategic options. More specifically to:

- Consider a strategic approach to how the County Council manages the highway asset to deliver an acceptable standard and value for money.
- Identify areas where further work, beyond the scope of the TFG, which may be required, such as the customer experience of delivery (Appendix A).

During the course of the work of the TFG, my colleagues and I were acutely aware that the analysis undertaken was done on the basis of a number of key assumptions.

All the figures shown in the various options are modelled and are therefore representative of the current and predicted condition of the highway. Further adverse weather conditions and any damage caused, cannot be predicted. However, the report highlights that better roads are more resilient and reduce the level of risk.

The report is written in the context of current economic and financial conditions. Neither the impact of inflation nor the cost of financing up-front investment have been considered in the figures presented to the TFG. These would have to be taken into account when looking at options for funding a strategic approach and will have an impact on the total cost of each option.

This report presents the findings for the consideration of the Cabinet Member for Highways and Transport.



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Deputy Cabinet Member for Highways and Transport

Membership:

Members of the County Council:

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Morwen Millson (LibDem)	Member for Horsham Riverside
John O'Brien (Chairman, Cons)	Member for East Grinstead South and Ashurst Wood
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Timescale:

The work of the TFG took place during the course of a series of meetings from 19th June to 31st July. The key activities of the TFG were as follows:

19 th June	-	Outline of the purpose and scope of the group
3 rd July	-	Understanding the asset management process
10 th July	-	Understanding the customer journey (1) – visit to Contact Centre
17 th July	-	Understanding the customer journey (2) – visit to Horsham Operational Management Centre and Broadbridge Heath Highway Depot
24 th July	-	Understanding the customer journey (3) – visit to works site with Balfour Beatty
31 st July	-	Consideration of strategic options for investment in the highways asset

Context: Damage to the highway

Following several years of adverse winters, extreme rainfall during the summer of 2012, the heaviest rainfall to hit West Sussex in over a century, caused widespread flooding, particularly in coastal parts of West Sussex.

On the roads, water passed through weaknesses and fine cracking in the road surface, into the foundations and caused significant threat to the condition of the structural layers of the road. Lying water also acted as a lubricant, which accelerated the process. The result was a surge in potholes, edge erosion and, in some cases, structural failure.

At the time, West Sussex County Council responded quickly to help the communities worst affected by the flooding, by launching Operation Watershed. The Council committed £8.25 million to the Operation, with works including fixing flooding hotspots, improving the water drainage system and putting surface water management plans in place. However, the extent of the damage was widespread and weaknesses in the structure remained.

The winter of 2012/13 brought further flooding and prolonged freezing conditions, which compounded the problems caused previously and accelerated the process of deterioration on the roads. The condition of the Principal and Non-Principal Network was kept to target levels but the Unclassified Network fell from 12% deterioration in 2009/10 to 20% at the start of 2012/13 and now stands at 22%. The condition of the Unclassified Network remains significantly above the 15% target level and, in places, there is a risk that the surface could break-up at any time.

Whilst exact figures are impossible to calculate and the condition of the network is updated on a daily basis, the estimated cost of the damage caused by the combined summer flooding and winter freeze is £8.3 million. Operation Watershed provided £3 million of funding directly to repairing the unclassified road network but approximately £5.3 million worth of damage remains. This has not been included in the modelling for Options 1 - 4.

Context: Local

West Sussex: Our Vision for the County

West Sussex County Council's strategic priorities are set out in [West Sussex: Our Vision for the County](#), which was agreed by the County Council on 19th July 2013.

The Vision emphasises the importance of reliable transport links, so that residents and businesses are supported and economic growth is sustained. It sets out priorities for transport links that connect people to jobs and businesses their customers and suppliers.

The Vision commits to doing the things that are best delivered collectively, to ensure that the best outcomes for residents are realised whilst resources are managed efficiently and effectively. It sets out how the County Council will plan ahead so that it can be there for residents at times of crisis and, at the same time, minimise the burden of local taxation.

West Sussex Transport Plan

The strategic approach set out in 'West Sussex: Our Vision for the County' is reflected in the [West Sussex Transport Plan 2011-16](#). The Transport Plan sets out the county's transport objectives in the wider context of their contribution to economic, environmental and social concerns. The key objectives are promoting economic growth; tackling climate change; enabling people to access services, employment and housing; and to improve safety, security and health.

The Integrated Works Programme

The County Council's current strategic approach to management of the highways asset is based around the Highways Integrated Works Programme (IWP). The IWP is a rolling two-year programme setting out capital investment.

The short timescale of the IWP means that, whilst local priorities can be expressed through County Local Committees' Local Infrastructure Plans, longer term strategic planning to manage the unclassified network is not possible.

The Cabinet Member for Highways and Transport has asked the TFG to consider a 20 year strategic approach to maintaining the unclassified highways network.

Context: National

Nationally, there are a number of strategic documents that set out evidence of the benefits of longer term strategic approaches to managing highways assets. The TFG gave careful consideration to these and key points are highlighted below:

Prevention and a Better Cure

The TFG considered the findings of an independent industry-led report, commissioned by the Department for Transport, aimed at maximising returns from investment in highways maintenance. Prevention and a Better Cure sets out three key messages:

- Intervention at the right time will reduce the number of potholes forming and prevent bigger problems later;
- Making the right interventions fixes problems and avoids continuous costs; and
- Communication with the public, about what is being done and how it is being done, is crucial.

Annual Local Authority Road Maintenance Survey 2013

The survey, commissioned by the Asphalt Industry Alliance (AIA), provides a national snapshot of the general condition of the local road network based on information provided by those responsible for maintaining it. The Chairman of the AIA suggests that local authorities risk allowing an asset worth £300 billion to further deteriorate by not making a significant one-time investment in repairing the damage.

Whilst being mindful of the authorship of the report, members of the TFG recognised that the risks highlighted by the Chairman applied to West Sussex, where the total value of the highway asset is £4.54 billion.

Economic, Environmental and Social Impact of Changes in Maintenance Spend on Roads in Scotland Summary Report

Research from Transport Scotland suggests that for every £1 reduction in spending on maintenance, there is a £1.50 cost to the economy.

Whilst the research was undertaken in Scotland, the TFG considered that many of the same issues and conditions were likely to apply to West Sussex.

Action for Roads – A Network for the 21st Century

The report by the Department for Transport sets out the Government's position with regard to strategic investment in the highways asset. Whilst the report picks up issues nationally, the TFG recognised the parallel with issues in West Sussex.

The report sets out the importance of maintaining the road to minimise roads closures, keep surfaces safe and prevent damage to vehicles. It highlights the benefits of long term planning to allow contractors to plan their works strategically for their most efficient delivery. It also points out that roads are built to higher safety standards now and that investment in the network will improve its safety for longer.

Assumptions

Our highway network

The table below sets out the size of the road network in West Sussex as of July 2012.

Classification	Total (km)	% of Network
Priority (A)	474.60	12%
Non Priority (B)	327.40	8%
Non Priority (C)	1006.10	25%
Unclassified	2,179.40	55%
Total	3.987.50	

The majority of our road network is made up of unclassified roads.

Current targets

West Sussex County Council's current performance targets for each type of road are:

- Principal roads - no more than 5% requiring structural maintenance
- Non-principal roads - no more than 10% requiring structural maintenance
- Unclassified roads - no more than 15% requiring structural maintenance

These are West Sussex County Council targets and therefore open to alteration. If the target for the unclassified network were to be amended, there would need to be careful consideration of how that would be communicated publically.

Current Condition

The table below sets out the percentage of our network that is currently in need of structural maintenance.

2012/13	% of the Highway requiring structural maintenance
Principal Roads	3
Non-Principal	8
Unclassified Roads	22%

The Principal and Non-Principal road network is being maintained at standard or above but the unclassified network continues to deteriorate on an annual basis.

The cost of improving the condition of the highway

Whilst it is impossible to make precise calculation regarding how much impact investment will make on the condition of the highway asset, a broad indicative assumption has been made in the modelling. This is based on a calculation of the cost of 1% improvement on the unclassified network:

Treatment to Produce 1% improvement	Cost
185,813 sqm of surface treatment on amber condition roads to prevent surface failure	£311,098
231,721 sqm of replacement surfacing on red condition roads	£5,793,040

As a rule of thumb, a 1% improvement in the unclassified network is considered to cost approximately £6 million.

Benefits of longer term strategies

Longer-term strategic planning of investment in the highways asset allows for better planning in order to build more resilience into roads. This will prevent damage, is more cost-effective and enables flexibility to manage unexpected events, such as further weather damage in the future. It also provides for better opportunities to engage with customers and manage expectations about what they can expect the condition of the roads to be.

Authorities with a long-term investment position also tend to find themselves in a better position when tendering contracts. A long term contract with secure funding is more attractive to potential bidders, which tends to make tenders more competitive.

Weather related damage

The current level of deterioration of the unclassified network is the result of severe weather conditions over the last couple of years. In particular, heavy rainfall in the summer of 2012, followed by freezing conditions in the winter of 2012/13 caused significant damage to roads across the county. In 2009/10, 12% of the unclassified network needed structural maintenance, by 2012/13 this had risen to 22%.

However the highways asset is managed, there remains a risk that further damage will be caused by severe weather conditions. However, better maintained roads are more resilient against extreme conditions and more preventative strategic approaches will offer reduced levels of risk.

Since 2009/10, the County Council has allocated additional funding, as well as the base budget, towards repairing damage caused by adverse weather conditions. As this funding is allocated as and when needed, and is not all specifically for road repairs, it should be considered as an additional cost consideration in maintaining the condition of the unclassified network.

Available funding

It is impossible to ignore that the TFG is reporting its findings at a particularly difficult time in local government finances. The County Council made £79 million of savings over the last three years, but will need to find more in the next few years.

In considering the options that are assessed in the report, the TFG was mindful of the financial difficulties facing the County Council, within the wider context of the national economy.

2012/13 winter damage

Adverse weather conditions during the winter of 2012/13 led to additional damage to the unclassified network, which has not been included in the modelling in options 1-4 below. This equates to an additional 1% deterioration from 21% to 22% requiring structural maintenance. It is estimated that the cost of repair would be £5.3 million.

Strategic Option 1: Maintain current spending

The option is for continued current funding levels for the unclassified network.

Category	£	Output
Planned Maintenance - preventative (Surface Treatment)	£4.2M	143.0 km of surface dressing 1,000,000 sq.m.
	£1.5M	30.0 km of micro surfacing/slurry 166,000 sq.m.
Planned Maintenance – Corrective (Resurfacing, patching and edge repairs)	£1.6M	11.0 km of resurfacing 64,000 sq.m.
	£1.9M	55,000 sq.m of patching repairs
	£0.2M	Emergency edge repairs only Other

The base budget would remain at **£9.4 million** per year, with a total spend of **£188 million over 20 years**. **4.6%** of the carriageway network would be treated per year and the modelling shows that towards the end of the 20 year period approximately 50-60% of the unclassified network will have failed.

With current levels of investment, there would be -

- Continued deterioration of the road network, leading to an increase in the number of potholes and other minor defects in the road;
- An increase in the costs for reactive repairs required each year;
- Continued deterioration in the unclassified network each year; and
- An increase in 3rd party legal claims (pothole damage claims rose fivefold between 2012 and 2013).

Other factors that would need to be taken account of are -

- In order to maintain safety on the unclassified network, decisions will need to be considered about roads that become dangerous to drive on. This may mean an increase in the reactive repair (revenue) budget, or putting in place warnings about hazardous conditions on the highway. These might include coning off areas and/or introducing signalling.
- Winter damage would remain a significant threat. Large parts of the unclassified network would become increasingly vulnerable to extensive damage from further winter conditions. This would make it more difficult to plan ahead, as we would be subject to unpredictable reactive spend every year.
- There would be an impact on journey reliability and the ride quality of journeys, particularly in rural areas. This may have an impact on businesses in the county, potentially decreasing the attractiveness of West Sussex as a place to visit or locate to.
- The County Council has a good record of defending claims, but there are hidden costs in the staff time employed in processing them. This includes Legal

Services staff but also Highways officers, reducing the capacity of the Operational Management Centre (OMC) to effectively manage the condition of the network.

- The increasing deterioration of the highway would mean a need for careful management of the public's expectations of the highway. Communities would need to be prepared for roads to be in worse condition, particularly in rural areas.
- How the contract was managed would need to be reconsidered. Resources allocated toward discretionary works may need to be reprioritised and deployed towards repairs.

Assessment: Option 1

This option would involve no additional funding in the short term but would see a significant deterioration in the condition of the unclassified network. It would lead to increasing levels of customer dissatisfaction and complaints. This itself would have significant cost implications for reactive maintenance and organisationally, in managing the decline of our network.

Strategic Option 2: Maintain current condition of the asset

This option is to maintain the current condition of the unclassified network at a steady state – currently at 21% deterioration.

Category	£	Output
Planned Maintenance – preventative (Surface Treatment)	£2.9 million	118.0 km of surface dressing 828,000 sq.m.
	£2.6 million	72.0 km of micro surfacing/slurry 433,333 sq.m.
Planned Maintenance – Corrective (Resurfacing, patching and edge repairs)	£3.0 million	17.0 km of resurfacing 120,000 sq.m.
	£2.2 million	Patching & Edge Repairs

The base budget would be increased to **£10.7 million**, increasing the total 20 year spend to **£214 million**. This would enable treatment to **5.1%** of the unclassified network per year. The increased base budget would be directed towards corrective maintenance, repairing those roads in the worst condition, rather than a preventative approach.

The option would -

- Maintain a level of deterioration in the condition of the unclassified network that the public are currently unhappy with;
- Cost an additional £26 million over 20 years ; and
- Take 10 years before the unclassified Highways Network was stabilised at the current level of deterioration.

Other factors that would need to be taken account of are –

- 3rd party legal claims against the County Council, journey reliability and ride quality would all be expected to remain at current levels;
- Winter damage would remain a significant threat;
- Large parts of the unclassified network would become increasingly vulnerable to extensive damage from further winter conditions. This would make it more difficult to plan ahead, as we would be subject to unpredictable reactive spend every year; and
- Further severe weather damage would lead to additional investment requirements to maintain 22% deterioration.

Assessment: Option 2

This option would involve significant additional investment for no immediate improvement in the unclassified network. It is likely that increasing levels of investment would be required year-on-year to maintain a road condition that the public is currently unhappy with.

Strategic Option 3: Improve the condition of the unclassified asset requiring structural maintenance to 15% over 10 years

This option is to make a significant improvement to the condition of unclassified network to decrease the level of deterioration.

Category	£	Output
Planned Maintenance – preventative	£2.4 million	98.0 km of surface dressing 686,000 sq.m.
	£3.6 million	100.0 km of micro surfacing/slurry 600,000 sq.m.
Planned Maintenance – Corrective (Resurfacing, patching and edge repairs)	£4.0 million	23.0 km of resurfacing 161,000 sq.m.
	£2.2 million	Patching & Edge Repairs

The base budget would be increased to **£12.2 million** per year, resulting in a total spend of **£244 million** over 20 years. Treatment would be made to **5.5%** of the unclassified network each year. The budget would remain largely focused on corrective maintenance, rather than preventative, and achievement of 15% deterioration would not be reached until year 10.

The option would -

- Significantly improve the condition of the unclassified road network;
- Cost an additional £56 million over 20 years ; and
- Take 10 years before the unclassified Highways Network was stabilised at the current level of deterioration.

Other issues to be considered are -

- There should be fewer potholes and other minor defects on the unclassified network;
- There should be a progressive improvement in customer satisfaction;
- 3rd party legal claims against the County Council would be likely to reduce;
- Journey reliability and ride quality would be expected to increase, which may have a positive impact on businesses in the county, potentially increasing the attractiveness of West Sussex as a place to visit or locate to; and
- The risk of further severe weather related damage would be reduced by year 10, due to increased resilience in the unclassified network.

Assessment: Option 3

This option requires a significant increase in base budget but no up-front investment. It would result in better a condition on the unclassified network and the associated benefits, but only after 10 years of investment. During that time, conditions would improve but the network would remain vulnerable to damage caused by further severe weather.

Strategic Option 4: Improve the condition of the unclassified asset requiring structural maintenance to 15% over 2 years

This option is to make a significant improvement on our unclassified network to bring it to 15% and restore resilience to this part of the asset within two years.

Category	£	Output
Planned Maintenance – preventative	Year 1 & 2	150.0 km of surface dressing 1 million sq.m.
	£3.5m	
	£11.1M	224 km of micro surfacing/slurry 1.2 million sq.m
	Years 2 to 20	98.0 km of surface dressing 686,000 sq.m.
Planned Maintenance – Corrective (Resurfacing, patching and edge repairs)	£3.5M	
	£3.1M	100.0 km of micro surfacing/slurry 1.2 million sq.m.
	Year 1 & 2	23.0 km of resurfacing 168,000 sq.m.
	£4.2M	
	£4.4M	Patching & Edge Repairs
	Years 2 to 20	7.0 km of resurfacing 40,000 sqm and patching & edge Repairs
	£1.6m	

This option is to make a significant improvement on our unclassified network to bring it to 15% within 2 years period by investing £30.0m.

36.4% of the unclassified network would be treated in the first two years. For years 2-20, **5.1%** of the total network will be treated annually. This represents a shift in the balance of funding allocation from corrective maintenance in the first 2 years, to planned preventative works from years 3 to 20.

This will require a base budget investment of **£8.2M/year** (a decrease on previous options), for future years (year 3 onwards) to maintain the steady state, resulting in a total spend over 20 years of **£194 million**. Achievement of 15% will be reached within the two year investment period reducing significantly the risk, that after severe weather conditions, additional funding will be required to cover winter damage.

The option should:

- Significantly reduce the potential pothole claims in the two year investment period;

- Improve customer satisfaction in the carriageway condition as urban residential areas are targeted for additional funding;
- Reduce the reactive budget requirements as the asset would be more resilient to future extreme weather conditions;
- Reduced levels of minor defects (such as pot holes);
- Potentially lead to a decrease in 3rd party claims;
- Improve local economic activity as the unclassified network services most of the local business community e.g. business parks, local shops etc.

Summary table of Options 1-4

Options	Base budget cost £million	Increase or decrease from current annual base budget £million	Initial investment cost	Total cost over 20 years £million	Deterioration condition of Unclassified Network after 20 years
1	9.4	0		188	50 - 60 %+
2	10.7	+1.3		214	21-22%
3	12.2	+2.8		244	15% (10yrs)
4	8.2	-1.2	30	194	15% (2yrs)

Findings and conclusion

When considering the options of a long term strategy for Highway Maintenance, the TFG considered that preventative approaches were better than reactive maintenance and give better results. Prevention is better than cure. It quickly became apparent to the TFG that Options 1-3 were not the most effective approaches:

- Option 1 would lead to a continual and rapid decline of the unclassified network;
- Option 2 would stabilise the condition unclassified network but is one of the most expensive options over the 20 year period and does not improve its current condition;
- Option 3 would restore and stabilise the condition of the unclassified network to the target level with no initial investment required. It would take 10 years to achieve, increasing the risk of additional severe weather damage during that time, and would require an increase in the base budget more expensive than options 1 and 2 over the 20 year period.

The TFG considered the preventive strategic approach set out in Option 4 to be more effective. Up-front investment would need to be made, depending on the cost of that investment, this option could:

- Give the best result to the condition of the unclassified network in the shortest time;
- Reduce the base budget by a substantial amount;
- Offer better value for money over the longer term;
- Improve customer satisfaction; and
- Reduce the risks of substantial additional weather damage

The TFG commissioned variations on the strategic principle of Option 4, to explore the impact of different levels of up-front investment. The modelling indicated that reducing the level of up-front investment also reduces the benefits and could cost more in the long term. There is a level of investment at which the condition of the unclassified network can be stabilised. Additional funding, beyond that required to halt continuing deterioration, would improve the condition and reduce the risk of further damage caused by adverse weather conditions.

Prevention is better than cure. In the long term, better roads are less expensive to maintain. By investing to restore the condition of unclassified roads, the resilience of the network will be improved. This will enable a shift in emphasis towards a preventative programme which will, in turn, reduce the need for reactive maintenance.



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