The DfT 19-20 Maintenance Challenge Fund

The Short Strategic Case

Norfolk County Council.

Resurfacing two strategic sites on our 'A' Road network

1. Overall bid Summary

1.1. The bid is for two 'A' road structural maintenance schemes on our resilient network. They are not 'just business as usual maintenance schemes' lifted from our programme. They strategical important schemes, the scale of which we cannot address via our current funding.

1.2. 1) A1122 Marham outside RAF base. Repair to war-time constructed bypass. 1.526km and 12,000sq.m = £1,036,800.
2) A1066 Thetford to Riddlesworth; Repair to heavily rutted road
   a) Section A, 4.133km 31,500sq.m = £1,328,400

Section B, 4.9km 40,000.m = £1,490,400

1.3. Total Cost = £3,855,600

1.4. DfT grant Requested = £3,431,484

Local Contribution NCC at 11% = £424,116

2. Senior Responsible Owner Declaration

2.1. As Senior Responsible Owner for the 2019-20 DfT Maintenance Challenge Fund bid, "Resurfacing two strategic sites on our 'A' Road network"

I hereby submit this request for approval to DfT on behalf of Norfolk County Council and confirm that I have the necessary authority to do so.

I confirm that Norfolk County Council will have all the necessary powers in place to ensure the planned timescales in the application can be realised.

2.2. Name: Grahame Bygrave

Position: Assistant Director (Highways & Waste)

Signed:

3. Contact details

3.1. If you have any queries concerning this bid, please contact

3.2. Grahame Bygrave Assistant Director (Highways & Waste)
Contact telephone number: 01603 224290
Email address: grahame.bygrave@norfolk.gov.uk

3.3. Kevin Townly Asset & Capital Programme Manager
Contact telephone number: 01603 222627
Email address: kevin.townly@norfolk.gov.uk

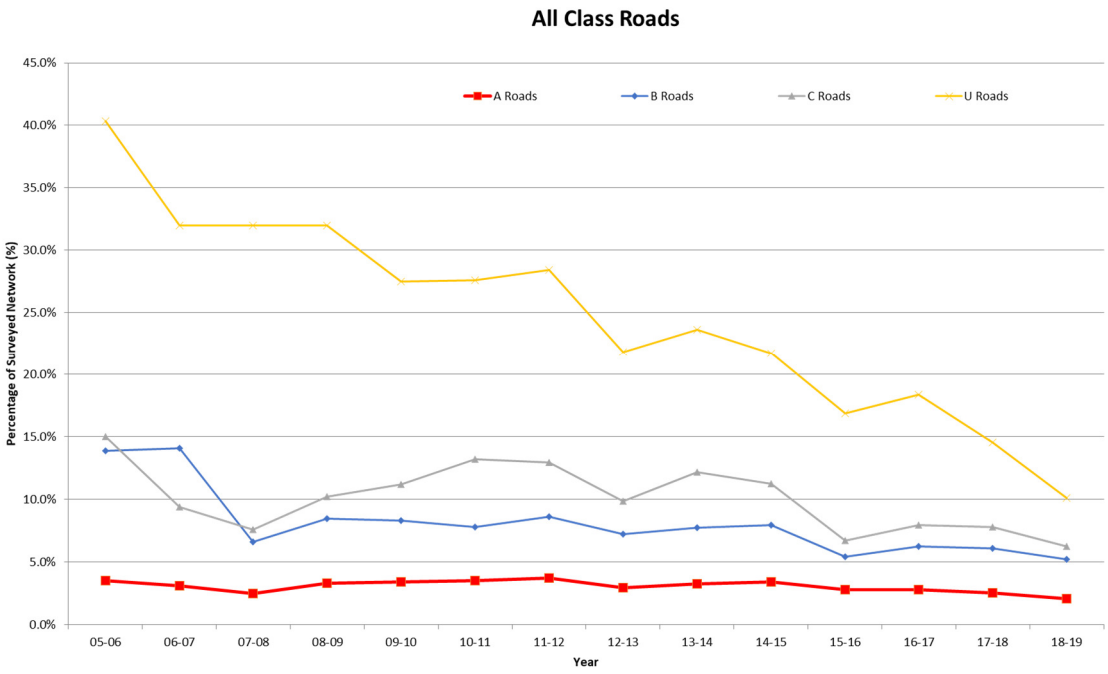
3.4. Postal address:
Community & Environmental Services Department
County Hall
Martineau Lane
Norwich
Norfolk,
NR1 2DH

4. Background

4.1. Norfolk has a successful asset management strategy based upon a high use of road surfacing intermediate treatments.

4.2. Road condition has been improved on all road classes since 2005/06. We use this as our reference year upon the adoption of SCANNER as our road condition measure for classified roads.

4.3.

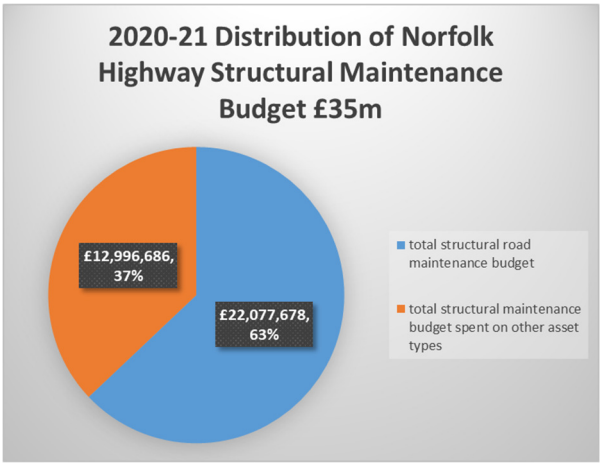


4.4. Our members have prioritised structural maintenance with our LTP, they agreed to use part of the LTP Integrated Transport (IT) spend some £2.842m on structural maintenance leaving the IT budget reduced to £1.3m in 2020/21. They are also providing an additional £2.624m through capital borrowing.

4.5. Expected 2020-21 Highway Structural Maintenance Budget

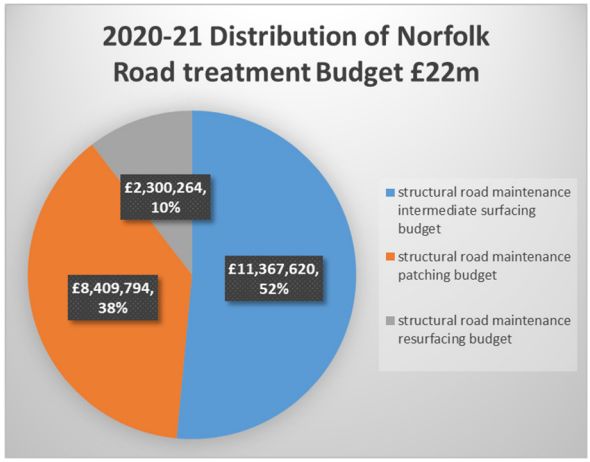
4.5.1. Our overall budget is expected to be £35,074,364, of this we plan to spend

- £22,077,678 on Carriageways = 63%
- £12,986,686 on other asset types



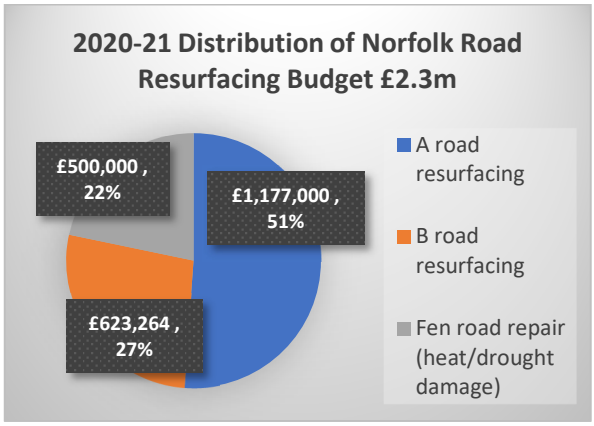
4.5.2. Of £22,077,678 on Carriageways we plan to spend

- £11,367,620 on intermediate surfacing treatment i.e. SD, Reclamite
- £8,409,794 on patching
- £2,300,264 on resurfacing



4.5.3. Of the £2,300,264 on resurfacing we plan to spend

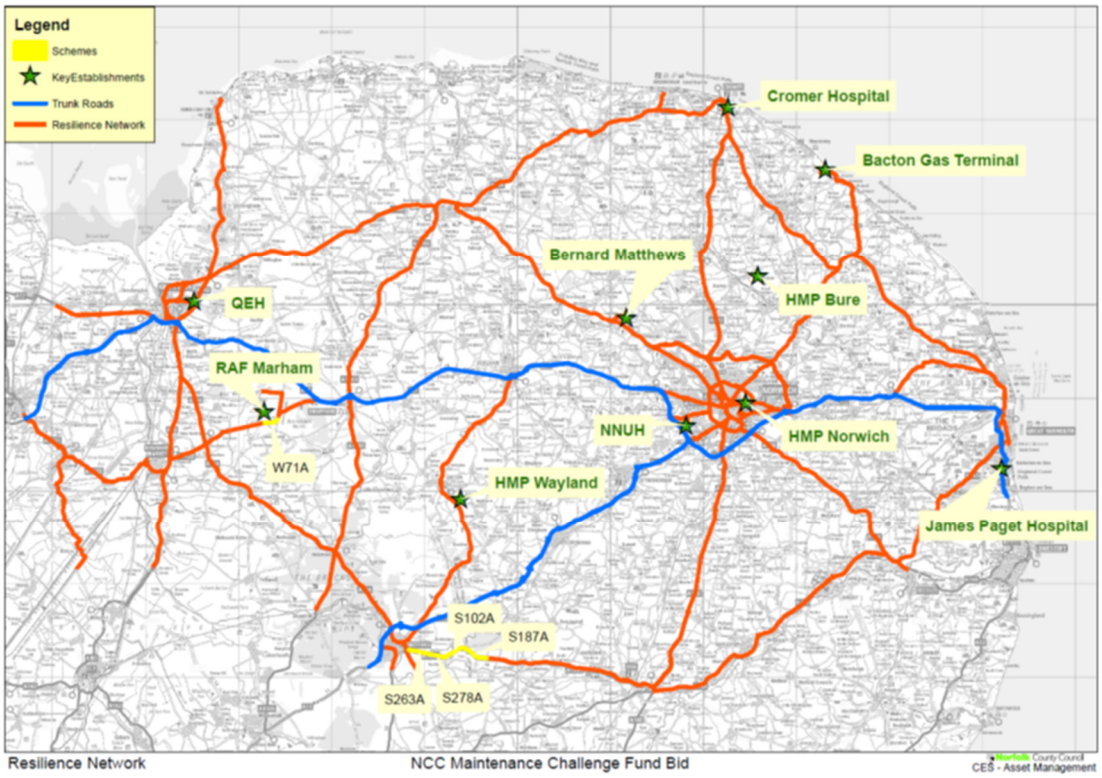
- £1,177,000 resurfacing on A roads. 51%.
- £623,264 resurfacing on B roads. 27%.
- £500,000 is for reactive repairs on fen roads. 22%. This amount has been increased in response to recent warmer drier summers in line with climate change expectations.



4.6. Our planned resurfacing programme for our 'A' roads in 2020-21 consists of 8 schemes = 3km = 1.9miles on a network of 820km.

4.7. In accordance with the 2014 Transport Resilience Review we have created our resilient network using it as weighting with our Multi Criteria Assessment (MCA) to prioritise schemes.

4.8.



4.9. Overall our 'A' road network is generally in sound condition.

Red = 2%
Amber = 26%
Green = 72%

4.10. However, there are two pressing issues which we are unable to address. Both have significant structural issues, some underlying within the pavement construction, which SCANNER as a "**Surface Condition Assessment** for the National Roads Network" does not identify or score within the RCI.

4.11. We are therefore asking the DfT to take notice of these as described in the following, in addition to the proforma supplied for the bid.

5. A1122 Marham Resurfacing

5.1. Why the asset needs urgent funding?

5.1.1. A1122 outside RAF Marham Airbase. This a Royal Air Force station and military airbase. It is home to No. 138 Expeditionary Air Wing and, as such, is one of the RAF's "Main Operating Bases".

5.1.2. The Ministry of Defence announced in March 2013 that the British fleet of Lockheed Martin F-35B Lightning aircraft, which would be operated jointly by the RAF and Royal Navy's Fleet Air Arm, would be based at RAF Marham. It is now home to two squadrons No 617 (The Dambusters) (from June 2018) and No. 207 Squadron (from 1 August 2019).

5.1.3. The A1122 was diverted in 1944 during the 2nd world war to enable to airbase to be expanded. This was required as Marham was one of only two sites built as a heavy bomber airfield with the runways substantially longer than the standard layout.

5.1.4. The diversion was constructed using the standard material of the time, concrete.

5.1.5. These concrete bays are now 75 years old. Whilst the road has been resurfaced and surface dressed, over the years the underlying bays remain in place. The joints have now broken, and this together with ground water movement have left the bays susceptible to movement.

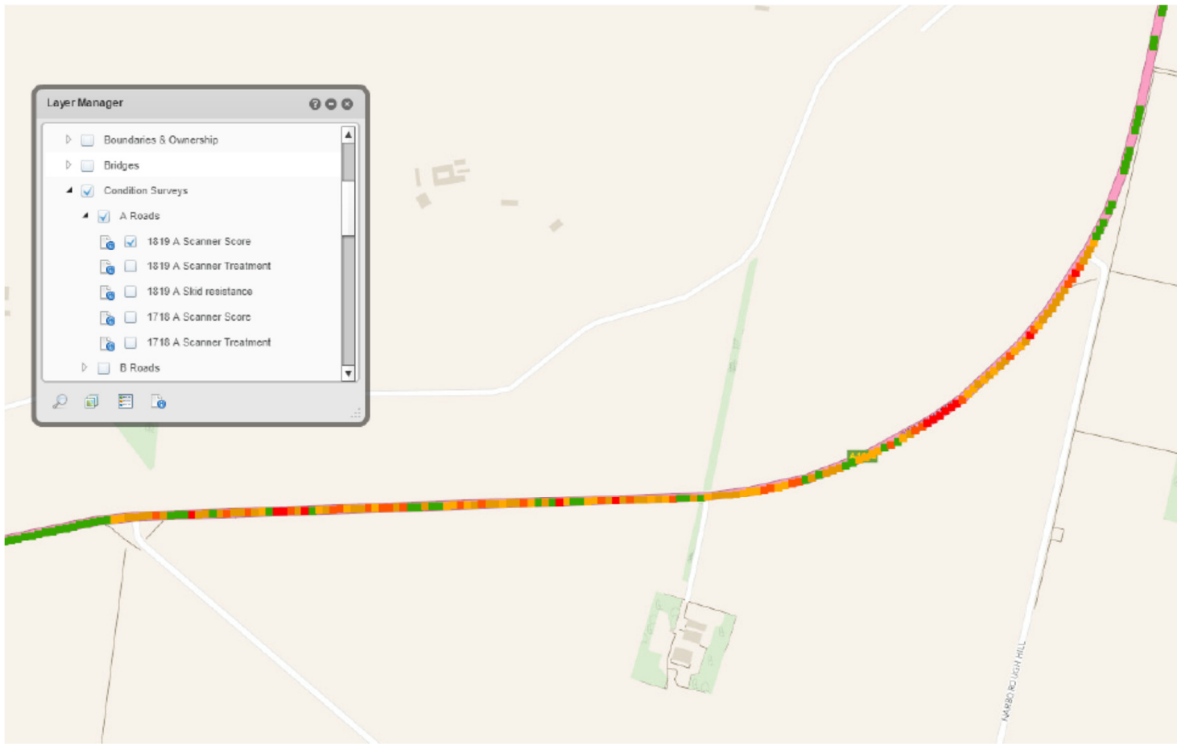
5.1.6. The road is rural single carriageway road with 60mph speed limit. It is typically 7.2m wide, with a centre ladder line marking. The lateral concrete joints can be seen in the following photograph showing the general arrangement of the road.

5.1.7.

5.1.8. Urgent maintenance is now required to repair the carriageway to secure reliable access on our resilient network to this nationally important piece of defence infrastructure. The limits of this are indicated in red in the following aerial image and the following Road Condition Index on Norfolk's mapping system

5.1.9.

5.1.10.



5.1.11. The maintenance challenge fund proforma for 2019-20 has been completed. We collect our road condition in the autumn. Unfortunately, the collection for season is still on going, as a result the data submitted is from 2018. Condition has deteriorated since. Hopefully this will be weighted in the assessment of the bid.

5.1.12. We would stress that when SCANNER assesses the defects shown in the following photographs, they are recording then as cracking. It is not possible for our knowledge of the underlying reasons for the cracking i.e. the aged defective concrete bays. Again, hopefully this will be weighted in the assessment of the bid.

5.1.13. Photographs of showing underlying lateral concrete joints

5.1.14. Photographs of showing underlying longitudinal concrete joint

5.1.15. Paul O'Hara of the DfT has e-mailed us to confirm that if we were successful, the DfT would expect to pay grant around Feb/March 2020.

"Yes, you can carry over grant into 2020-21 as we expect we would pay grant to successful authorities around Feb/March 2020. In practical terms not, much can be done on the ground until later in the spring, so a realistic timetable would be start of works around spring/summer 2020."

5.1.16. This fits well with the seasonal (Sept-Mar) demand on this route for Sugar Beet haulage to the British Sugar Plant at Wissington. (The largest sugar processing plant in Europe).

5.2. **What options have been considered and why have alternatives have been rejected?**

5.2.1. A1122 Marham Treatment Summary

Length of site 1526 m

Av width of site 7.2 m

Area of site 10,987 m2

Budget Estimate allow for 12,000 m2 to include junctions

5.2.2. Two types of treatment considered for this site

A. Injection to underside of concrete slab, with joint repairs and full resurfacing

B. Rubbilisation of concrete slab and treat as Type 1 subbase, with full reconstruction and resurfacing

5.3. **Option A; Injection to underside of concrete slab, with joint repairs and full resurfacing**

5.3.1. 1. Inject underside of concrete slab at 200 lin.m. per shift = 16 shifts. Estimate from specialist contractor at £20,000 per shift but subject to actual quantities of material used. Large voids beneath slab could result in significant additional costs. Works to be carried out using temporary traffic signals with minimal impact on network

2. Install full road closure on completion of injection phase. Plane existing carriageway to full depth approx. 800 T per shift = 5 shifts. Commence joint repairs one day after planning commences and continue for 10 shifts.

3. Commence carriageway surfacing four days after joint repairs commence. 25mm SAMI layer = 2 shifts, 60mm HRA PMB binder course layer = 4 shifts, 40mm SMA PMB surface course layer = 3 shifts

4. Estimated cost of treatment £980,000

Design Fees & supervision at 8% = 78,400

Total cost £1,058,400

5.4. **Option B; Rubbilisation of concrete slab and treat as Type 1 sub-base, with full reconstruction and resurfacing**

5.4.1. 1. Install full road closure on day 1 of scheme. Plane existing asphalt layers and remove. Plane concrete and leave in-situ. NRP have suggested using 2 no 2 metre planers giving a 5-day programme at £20,000 per day

2. Grade and compact concrete arisings to required levels, to commence on day 3 of programme

3. Commence carriageway surfacing on day 6 of programme. 120mm HRA PMB road base layer = 7 shifts, 60mm HRA PMB binder course layer = 4 shifts, 40mm SMA PMB surface course layer = 3 shifts

4. Estimated cost of treatment £960,000

NB. Estimates for Options A & B include the same allowance for the disposal of possible contaminated arisings at £122,000

Design Fees & supervision at 8% = 76,800

Total cost £1,036,800

5.5. **Preferred solution**

5.5.1. Our preferred solution is Option B. The scale of cost for both options is similar but we consider Option B to be a more complete, reliable solution. £1,036,800.

5.6. **What are the expected benefits / outcomes?**

5.6.1. Mitigation of a developing risk on our on our resilient network enhancing its reliability and security of access to this national important piece of defence infrastructure.

5.7. **The geographical areas that will benefit from your scheme. You should indicate those areas that will directly benefit, areas that will indirectly benefit and those areas that will be impacted adversely.**

5.7.1. This section of road is part of our resilient network and hence the proposed resurfacing will improve reliability and benefit the whole of the County, but West Norfolk in particular.

5.8. **What will happen if funding for this scheme is not secured - would an alternative (lower cost) solution be implemented (if yes, please describe this alternative and how it differs from the proposed scheme)?**

5.8.1. Other than the maintenance challenge fund bid this is unaffordable and represents 88% of our planned A road resurfacing budget for 2020-21.

5.8.2. Ad-hoc replacement of individual concrete bays when they reach failure. This is likely to lead to a series of unplanned reactive works with road closures. This would affect the reliability of our resilient causing 42km diversion and associated 39-minute additional journey.

5.8.3. Access to the RAF base would be hindered. Local businesses would be affected particularly the agri-food sector notably the British Sugar Plant at Wissington.

6. A1066 Thetford to Riddlesworth

6.1. Why the asset needs urgent funding?

6.1.1. The last two hot summers has led to an extraordinary increase in the rate of rutting deformation. Our asset team have been made aware of the rapid deterioration from some 3rd party photographs which have been verified using our defect gauges. This has verified rutting in the region of 30mm to 80mm for much of the length.

6.1.2. The road is rural single carriageway road with the national speed limit apply. It is typically 7.8m wide. The longitudinal rutting, particularly in the near side wheel-track can be seen in the following photograph showing the general arrangement of the road. Warning signs “uneven road” are now being erected to inform users of the hazard.

6.1.3.

6.1.4. See following a series of photographs taken since the summer, from our inspection team.

6.1.5.

6.1.6.

6.1.7.

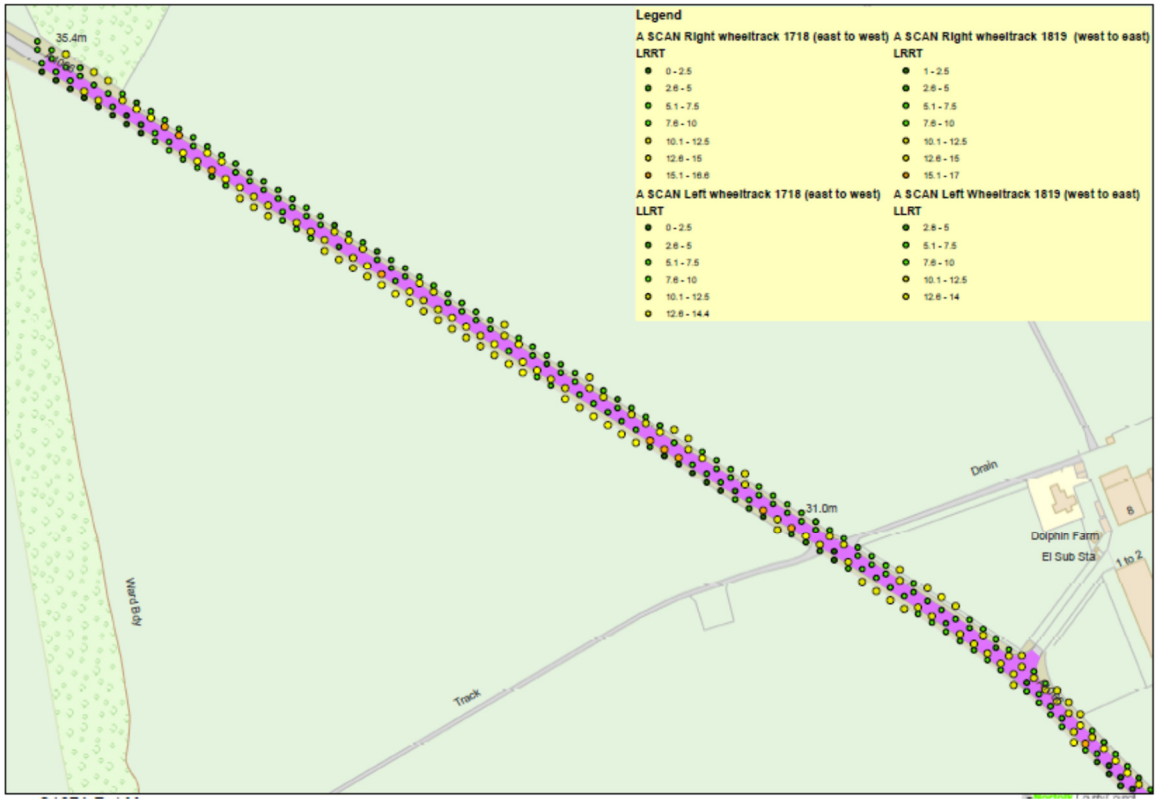
6.1.8.

6.1.9.

6.1.10.

6.1.11. We had been monitoring this site and the carriageway had been exhibiting shallow rutting but generally below 10mm with some between 10mm to 15mm. See following rut map using 2018-19 data (Sept 2018).

6.1.12.



6.1.13. From the “SCANNER Surveys for Local Roads” User Guide and Specification Voume 3 2011 Figure 3.1, you can see rutting of 10mm and below was considered green, 10mm to 20mm Amber and above 20mm Red

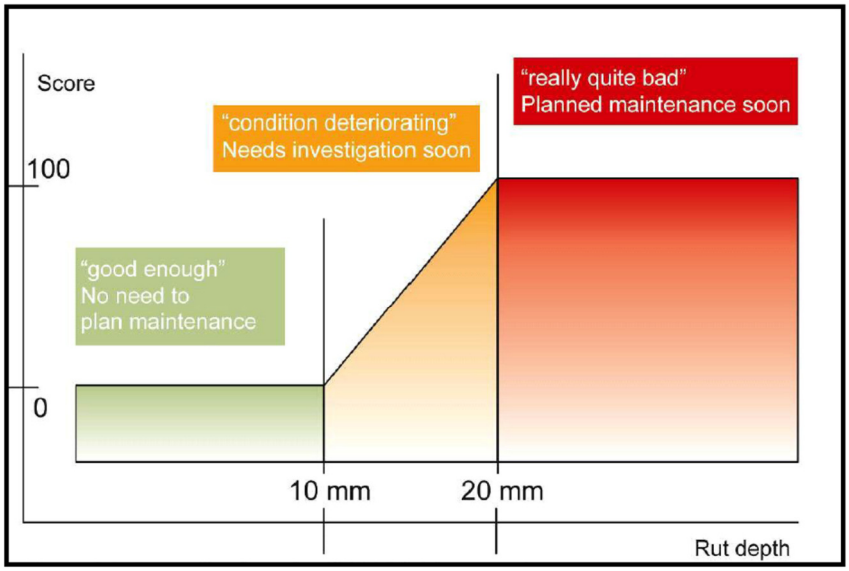
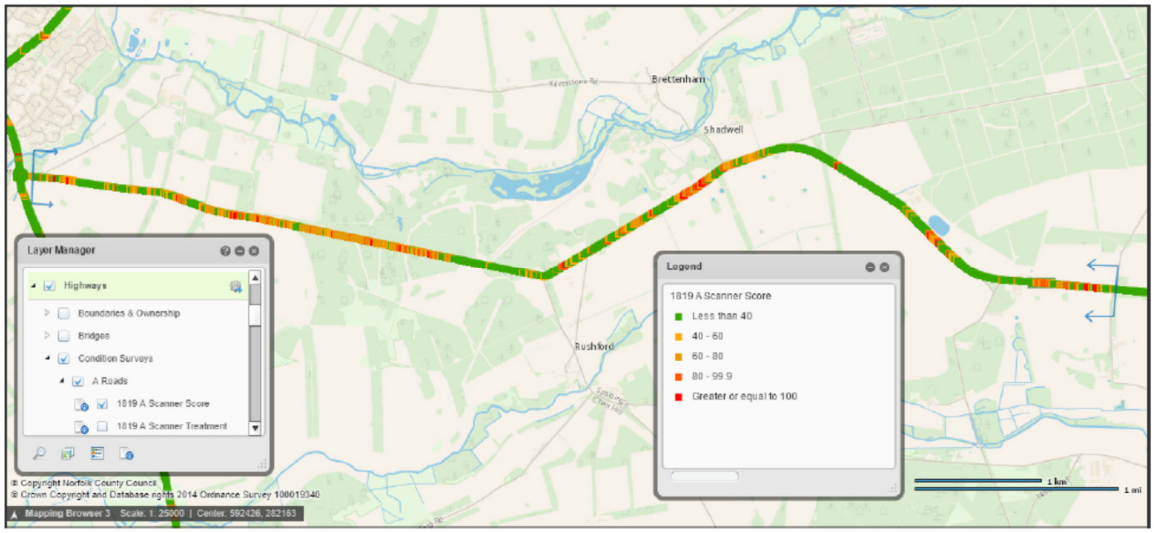


Figure 3.1 Example of scoring a SCANNER parameter – average rut depth

6.1.14. However, as in the autumn of 2018 large amounts of the rutting was less than 10mm the Road Condition Index in 2018 is far better condition than the current.

6.1.15.



6.1.16. The extremely rapid deterioration from 10-15mm to the current very, poor condition seen post summer 2019, is the result of recent hot summers, one of the outcomes of predicted climate change.

6.1.17. We collect our road condition in the autumn. Unfortunately, our collection for season is still on going, and we do not yet hold our data for 2019-20. As a result, the data submitted is from 2018-19. Our photographic evidence shows that Condition has clearly deteriorated since.

6.1.18. The maintenance challenge fund proforma for 2019-20 has been completed based on the latest condition data we hold which is 2018-19. It is hoped that this will be weighted in the assessment of the bid. The photographic evidence supplied needs to be given some consideration as the 2018-19 data does not demonstrate the real need.

6.1.19. Urgent maintenance is now required to repair the carriageway to secure reliable access on our resilient network to this nationally important piece of defence infrastructure. Warning signs "Uneven road" are being erected.

6.2. **What options have been considered and why have alternatives have been rejected?**

6.2.1. **Section 1; A1066 Brettenham Treatment Summary (Section from A1088 Thetford to C147 Rushford Junction**

Length of site 4133 m
Av width of site 7.3 m
Area of site 31,313 m2 Budget Estimate allow for 31,500 m2 to include junctions

Three types of treatment considered for this site

A. Asphalt patching and full resurfacing
B. Recycled haunch and full resurfacing
C. Recycling of site with full resurfacing

6.2.1.1. **Option A**

1. 100mm & 200mm asphalt patching to North & South channels. Full carriageway resurfacing at 100mm. Patching works to be carried out using temporary traffic signals with minimal impact on network. Estimated duration 9 nights.
2. Commence carriageway surfacing on day 10 of programme. 60mm HRA PMB binder course layer = 12 shifts, 40mm SMA PMB surface course layer = 8 shifts. Full road closure overnight for 20 nights

3. Estimated cost of treatment £1,230,000. Includes allowance for disposal of contaminated arisings at £108,000

3.1.1.1. **Option B**

1. 250mm recycled haunch at 2.0m wide to North & South channels. Haunching works to be carried out using temporary traffic signals with minimal impact on network. Estimated duration 20 days.

2. Commence carriageway surfacing on day 10 of programme. 60mm HRA PMB binder course layer = 12 shifts, 40mm SMA PMB surface course layer = 8 shifts. Full road closure overnight for 20 nights

3. Estimated cost of treatment £1,180,000

3.1.1.2. **Option C**

1. Install full road closure on day 1 of scheme. Pulverise and stabilise full length of scheme. Outputs assumed at 2000 m2 per day

2. Commence carriageway surfacing on day 6 of programme. 60mm HRA PMB binder course layer = 12 shifts, 40mm SMA PMB surface course layer = 8 shifts. Total duration estimated at 25 days

3. Estimated cost of treatment £1,380,000

3.1.1.3. **Preferred Option**

Option A. £1,230,00 x 8% design and construction = £1,328,400

The scale of cost for both options is similar but we consider Option B to be a more complete, reliable solution. It also gives a greater uniformity of plant and materials to deliver the adjoining section 2, generating efficiencies.

3.1.2. **Section 2 A1066 Shadwell & Riddlesworth (Section from C147 Rushford Junction to 33153 Lodge Lane**

Length of site 4900 m
Av width of site 7.8 m
Area of site 38220 m2 Budget Estimate allow for 40000 m2 to include junctions

Suggested treatment 100mm plane & inlay
Treatment to be 60mm HRA PMB binder course, 40mm SMA 40/60 pen surface course
Duration 40 days 7.30 to 17.00 working using temporary signals with convoy system

Estimated cost £1,380,000 works + 8% design and supervision = £1490,400

3.1.3. **Cost of Total Scheme (both sections)**

1. **Section 1 = £1,328,400**
2. **Section 2 = £1,490,400**

Total length of combined scheme 9033m, 71,500sq.m

Total = £2,818,800

3.2. **What are the expected benefits / outcomes?**

3.2.1. Mitigation of a developing risk weakness on our on our resilient network enhancing its reliability and security of access for the economic and well-being of the County.

3.3. **The geographical areas that will benefit from your scheme. You should indicate those areas that will directly benefit, areas that will indirectly benefit and those areas that will be impacted adversely.**

3.3.1. This section of road is part of our resilient network and hence the proposed resurfacing will improve reliability and benefit the whole of the County but Breckland and South Norfolk in particular.

3.3.2. The A1066 runs down the Waveney valley border of Norfolk and Suffolk. As a result, it also provides benefit for the County of Suffolk, West Suffolk and is an access route to the 'Broads National Park."

3.4. **What will happen if funding for this scheme is not secured - would an alternative (lower cost) solution be implemented (if yes, please describe this alternative and how it differs from the proposed scheme)?**

3.4.1. Without treatment the deformation will worsen leading to safety concerns, particularly in the wet, consideration will have to be given to potential reduction in speed limit, and additional "uneven road" warning signs.

3.4.2. Other than the maintenance challenge fund bid this is unaffordable and represents 239% of our planned A road resurfacing budget for 2020-21.

3.4.3. We would not be able to fund the entire length of the scheme and would undertake smaller localised scheme over a series of years. These would not generate the same economies of scale. This is likely to lead to a series of unplanned reactive works with road closures. This would affect the reliability of our resilient causing 73 km diversion and associated increased journey time due to diversion of 61 minutes.

4. **Proven Ability to Deliver**

4.1. Norfolk has established delivery mechanisms which can be demonstrated in the delivery of other DfT 'bid-based' projects; -

- Maintenance Challenge Fund Tranche 1 £10.5. Norwich Surface Water Drainage 2015-18
- November 2018 budget additional £12.7m of which we used £6,000,000 on resurfacing enabling the completion of an additional 37 surfacing schemes totalling 16.4 miles (26.4km) in 3 months with our contractor Tarmac.
- National Productivity Investment Fund (NPIF) 2018-19-20 A140 Hempnall Roundabout due to open November 2019

4.2. If successful we will deliver this proposed package of work to time and budget.