Local Highways Maintenance Challenge Fund

Department for Transport

Application Form: bids for funding in 2019/20

The level of information provided on this form should be proportionate to the size and complexity of the works proposed. An Excel data proforma should also be completed.

Note that DfT funding is a maximum of £5 million per project for bids in 2019-20. An individual local highway authority may apply to bid for only one scheme. Funding will be provided in 2019/20, but it is recognised that construction may go into 2020/21 as well. The closing date for bids is 31 October 2019.

For schemes submitted by a Combined Authority for component authorities a separate application form should be completed for each scheme, then the CA should rank them in order of preference.

Applicant Information

Local authority name: Suffolk County Council

Bid Manager Name and position: Colin Godfrey, Structures Asset Manager
Name and position of officer with day to day responsibility for delivering the proposed scheme.

Contact telephone number: 07733 318145
Email address: colin.godfrey@suffolkhighways.org

Postal address: Suffolk Highways
Phoenix House, 1st Floor, Block 1, Desk 41
3 Goddard Road
Ipswich, Suffolk **Postcode:** IP1 5NP

Combined Authorities

If the bid is from a local highway authority within a Combined Authority, please specify the contact and ensure that the Combined Authority has submitted a Combined Authority Application Ranking Form.

Name and position of Combined Authority Bid Co-ordinator: Not applicable

Contact telephone number: Not applicable **Email address:** Not applicable

Postal address: Not applicable

When authorities submit a bid for funding to the Department, as part of the Government's commitment to greater openness in the public sector under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, the local highway authority must also publish a version excluding any commercially sensitive information on their own website within two working days of submitting the final bid to the Department.
Please specify the weblink where this bid will be published:
https://www..suffolk.gov.uk/assets/Roads-and-transport/how-we-manage-highway-maintenance/Highways-Maintenance-Challenge-Fund-Tranche-2B-Application-Form.pdf

SECTION A – Description of works

A1. Project name: Major maintence to Suffolk's critical highway structures

A2. Headline description: Works to reinstate critical structures in Suffolk

Proposed start date January 2020

Estimated Completion date March 2023

Brief description
The works will include reinstatement and replacement of several structures within Suffolk that are critical to accommodating traffic movements to and from national strategic transportation links and fundamental to connecting communities, businesses and emergency services.

A3. Geographic area:

Please provide a short description of the location referred to in the bid (in no more than 50 words)
The proposed scheme incorporates fourteen (14) structures of high national and local importance, which do not form part of a single route or geographical locations.

Structure locations include Ipswich, Sproughton, Felixstowe, Martlesham, Snape, Needham, Sicklesmere and Bures.

OS Grid Reference: See Appendices A and B for more information and map of locations.
Postcode: See Appendices A and B for more information and map of locations.

You might wish to append a map showing the location (and route) of the proposed project, existing transport infrastructure and other points of particular interest to the bid.

A4. Type of works (please tick relevant box):

DfT funding of **up to £5 million in 2019/20**

Structural maintenance, strengthening or renewal of structures, viaducts, retaining walls or other key structures, foot structure or cycle structure renewal
☒

Major maintenance, full depth reconstruction of carriageways, structural maintenance of tunnels
☐

Resurfacing of carriageways including improvements to footways or cycleways that are within the highway boundary
☐

Renewal of gullies and replacement of drainage assets
☐

SECTION B – The Business Case

B1. The Financial Case – Project Costs and Profile

Before preparing a proposal for submission, bid promoters should ensure they understand the financial implications of developing the project (including any implications for future resource spend and ongoing costs relating to maintaining and operating the asset), and the need to secure and underwrite any necessary funding outside the Department's maximum contribution.

Please complete the table below. **Figures should be entered in £000s** (i.e. £10,000 = 10).

Funding profile (Nominal terms)

£000s	***2019-20***	***2020-21***
DfT Funding Sought	*5,000*	*DfT funding not available in 2020-21*
LA Contribution	*100*	*445*
Other Third Party Funding	*0*	*0*

Notes:
1) Department for Transport funding will be granted in the 2019-20 financial year but local highway authorities may carry that funding over to following financial years if necessary.
2) There is no specific amount for a local contribution by the local authority and/or a third party but if this is proposed please state what this is expected to be.

B2. Local Contribution / Third Party Funding

Please provide information on the following points (where applicable):

a) The non-DfT contribution may include funding from the local authority or a third party. This should include evidence to show how any third party contributions are being secured, the level of commitment and when they will become available.
No third-party funding will be used to fund this scheme.
There will be a local authority contribution as set out in Section B1.

b) Please list any other funding applications you have made for this project or variants of it and the outcome of these applications, including any reasons for rejection (e.g. applications made through any similar competition).
None

B3. Strategic Case (sections (a) to (g) below)

This section should **briefly** set out the rationale for making the investment and evidence of the existing situation, set out the history of the asset and why it is needs to be repaired or renewed. It should also include how it fits into the overall asset management strategy for the authority **and why it cannot be funded through the annual Highways Maintenance Block Funding grant.**

a) What are the current problems to be addressed by the proposed works? (Describe economic, environmental, social problems or opportunities which will be addressed by the scheme).

The proposed investment incorporates fourteen structures (refer to Appendix A for detailed list and Appendix B for a map showing their locations) of high national and local importance.
Six structures, representative of the overall project, are used to produce proformas that accompany this application (following advise provided from Paul O'Hara of the Department for Transport on 17/09/2019). These structures are identified with blue logos in Appendix B.

The identified structures do not form part of a single route, nor do they have a common structural issue. They do however support critical parts of Suffolk's network that are vital in sustaining the national and local economy as well as keeping residents and visitors connected. The other common denominator these structures share is their state of disrepair and, consequentially, the requirement for significant investment to safeguard their uninterrupted use today and for future generations.

A number of these structures are at risk of being weight-restricted, whereas other structures are already in this position and are likely to have a further reduction of capacity, or even are at risk of being closed in the near future (refer to Appendix A and section C2 of Appendix C for more details).

These risks pose a number of challenges, discussed below, that can be addressed with funding secured from this bid.

Significant disruptions are foreseen locally and, in some cases, on the adjacent strategic trunk and local road networks as a result of these risks materialising. A number of the structures in Ipswich serve Abnormal Indivisible Load movements out of Ipswich port, others are on agreed A14 trunk road diversion routes and on or nearby East Anglia ONE construction access routes. A recent Abnormal Load movement out of the port to a nearby electricity sub-station required a temporary bridge to be constructed over Ostrich Creek Bridge due to its restricted load carrying capacity. Construction and removal of the temporary bridge caused significant additional disruption, and came at considerable cost, which will ultimately be borne by the public.

Ipswich has seen several incidents of major travel disruption in the past few years, caused by lengthy unexpected Orwell bridge closures (see Appendix D for extent of disruption). The Orwell bridge supports a vital section of the A14 linking the Port of Felixstowe with the rest of the country. The bridge has seen a rise in the number and length of closures in the past two years due to increased occurrences of severe weather. The effect of such closures would be severely worsened, should Stoke bridge, Ostrich Creek Bridge, or Yarmouth Road Bridge in Ipswich become non-operational or weight-restricted. In this scenario, national and local traffic would be subjected to supplementary diversions that would burden road users to a further two-hour travel time and the consequential impact on the economy, air quality and pollution.

In January 2018, Ipswich Central, the Business Improvement District company for Ipswich, said:

"The town's economy had suffered a £1million hit during one day of closure, while the bumper-to-bumper traffic and journey times of two hours for just a handful of miles are regular occurrences during bridge closures.

Furthermore, increased travel times and the re-routing of traffic will severely restrict and impact emergency services response times and ability of the public to access these.

Economic impact on surrounding businesses is primarily evaluated in terms of business revenue change. It was suggested by several research studies (such as those by Schieck and Young[1] and Wolffing et al.[2]) that a majority of cities would observe a decline of approximately 10% in business revenue during bridge construction works. Although, this is not directly related to bridge closures, it is a typical action that follows a closure. In Suffolk, this figure is likely to be higher due to the Port of Felixstowe, the busiest container port in the UK, which deals with 48% of Britain's containerised trade, and numerous businesses that depend on its seamless functioning both in Suffolk and throughout the UK.

b) Why the asset is in need of urgent funding?

The funding made available for maintenance and renewal over the last 13-year period has been used to manage an ongoing decline in condition of Suffolk's structures. This management ensures that they remain safe for use and for now, limit disruption and inconvenience associated with structural weight and traffic restrictions. This has only been possible due to the relatively good condition of the structures stock at the start of this period in 2005 (refer to section C1 of Appendix C) and relatively long design lives of many components of a structure in comparison with other highway asset types.

The ongoing and long-term underfunding of a deteriorating structures stock and delayed interventions mean that more structures now need to be re-assessed to take account of this deterioration on load carrying capacity. The outcome of these assessments has already indicated sub-standard structures and will inevitably lead to an increased number of structural assessment failures and additional interim mitigation measures such as structural weight restrictions and in the worst case, the need to close bridges. For example, significant weakness in the load-bearing elements of Sproughton bridge mean that a substantial risk remains despite the 7.5T structural weight restriction with temporary bollards installed. The structure will be a subject to a full closure in the near future if its already enhanced monitoring regime identifies further deterioration and associated risks to the public.

Significant work was undertaken in the development of lifecycle plans and future capital investment scenarios has highlighted a considerable gap between available funding and that required to sustain all highway infrastructure assets in a steady-state condition. The Highways Maintenance Block Funding received by the Council has suffered a 21% reduction over the past seven years and many structural components are approaching the end of their design/service life. The consequential deterioration, in tangible terms, will increase instances of interim maintenance works disrupting availability and the resilience of Suffolk's structures to meet todays and future requirements. The existing levels of investment in highway structures are insufficient to arrest the rate of deterioration and additional funding to undertake major strengthening and, in some cases, replacement interventions is now required.

[1] Schieck S. and Young R. Highway Construction Related Business Impacts: Phase II Report, Wyoming Department of Transportation, Laramie, WY, 2005.
[2] Wolffing C., Liesman J., Young R., and Ksaibati K. Highway Construction Related Business Impacts: Phase I Report, Wyoming Department of Transportation, Laramie, WY, 2004.

c) What options have been considered and why have alternatives have been rejected?

The scenarios discussed below were considered when assessing feasible maintenance options.

Do Nothing

The consequence of this scenario would be further deterioration leading to a structure being weight-restricted and eventually closed to traffic. This could be managed in the short-term through an increased inspection regime and with an associated financial and inspection burden.

In a worst-case scenario, significant deterioration could lead to a catastrophic failure event with a potential loss of life. The recovery costs, of such an event, can only be taken from existing maintenance budgets. The net reduction of residual funding for other essential maintenance will increase the overall risk profile of the structures stock and the chance of further significant failures in the future.

This scenario is also likely to attract adverse news coverage and impact on public confidence inflicting reputational damage to both local and central governments.

This option was disregarded.

Protect and Repair

This scenario represents actions or strategies that prevent, delay, or reduce deterioration of structures and their elements, and, where required, restore their function, keep them in good condition and extend their life.

Structure asset preservation includes cyclical preventive maintenance and condition-based maintenance. Such actions typically represent regular and frequent minor interventions that slow down the rate of deterioration and are applied at an early stage of asset degradation. These frequent interventions require recurring network occupancy in order to complete necessary works impacting on unrestricted use by all road users.

This scenario was rejected as the structures forming part of this bid are at the stage where significant strengthening or replacement works are required.

Rehabilitate

This scenario incorporates major interventions required to replace or over-haul significant load-bearing elements aimed at restoring the structural integrity of the asset and completing other necessary work to correct major safety defects.

This option is recommended for some structures forming part of this bid.

Replace

This scenario is typically applied when the required window for rehabilitation work has passed and a structure has become ‘structurally deficient’. This option may also be relevant at an earlier stage, when replacement of a structure has a potential to represent a better value for money (in terms of whole life cost) in comparison with a rehabilitation option.

This option is recommended for some structures forming part of this bid.

d) What are the expected benefits / outcomes?

Structures are a critical component of a nation's infrastructure, making it possible to deliver raw materials and finished goods to factories, warehouses, suppliers, distributors, stores, and end-consumers. Being located alongside and on diversion routes for the Strategic Road Network, the structures selected for this scheme support the seamless operation of the trade traffic coming in to and from the Port of Felixstowe, which is a key economic asset for the county, the East of England, and the UK as a whole.

The Port of Felixstowe is the UK's biggest container port handling nearly a half of all UK container trade in both directions. It is also the UK's largest deep-water container port and the only port to offer berths for the largest container ships. With an increase of the traffic by nearly a third since 2012, the Port of Felixstowe's major expansion works and the vast majority of the container ships received coming from China, forecasts indicate that the throughput will continue to grow. Furthermore, whilst the outcome of Brexit is unknown, leaving the EU may in the short-term increase the UK's reliance on non-EU trade.

Combined, Suffolk's bridges support strategic roads and cross freight railways that transport the delivery of around 70% of the containers coming through the Port of Felixstowe to the 'Golden Triangle', a major hub for the country's distribution sector, strategically placed to access 98% of the UK population within 4-hour drivetime.

Nine of this scheme's bridges form part of either the Strategic Lorry Route network (Appendix E), Suffolk's Resilient Network, or both and seven of these have average diversion times ranging between 45 and 74 minutes.

Coronation Drive bridge and Felixstowe Road Rail bridge span across the Felixstowe Branch Line, used to transport freight to and from the Port of Felixstowe and is also a key route for cross-country passenger travel.

There are also bridges proposed in this scheme, such as Martlesham bridge and Yarmouth Road bridge in Ipswich, that are situated on or nearby HGV construction access routes for East Anglia offshore windfarm. This is a major renewable energy project that is already providing a significant boost to the local economy with over £70 million being committed to date to companies across the East of England and further opportunities as the project becomes operational.

Lifecycle planning, using the Structures Toolkit, demonstrates that the 'Do Nothing' scenario would result in a backlog of over £24 million in 30 years with the average and critical bridge stock condition indicators dropping to 17.7 and 7.2 respectively (see Appendix F).

The Structures Toolkit assumes that traffic restrictions and traffic delay costs are incurred for every structure for which safety or performance is at risk. The analysis demonstrates that over £4.7 million of traffic delay costs would be mitigated over the next 30 years for a similar amount of investment made in the next one to three years into the highway structures forming the basis of this bid.

Costs associated with delays are notoriously difficult to accurately determine and, for the purposes of this bid, have been based on high-level national assumptions. It is entirely possible that these savings could be considerably greater when local strategic importance factors are applied.

The Structures Toolkit suggest that an investment of £5.5 million into the structures identified in this bid would provide a saving in the region of £17 million over a 30-year period when compared to the 'Do Nothing 'scenario. In simple terms, for each £1 spent this would save over £3 to the national and local economy, supporting growth and prosperity.

f) 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)?

With many components of the identified structures approaching an end of their design life, an increase in the rate of deterioration is becoming more apparent, especially when the existing levels of investment in highway structures are not sufficient to arrest such rate of deterioration.

Should additional funding not be secured to rehabilitate or replace the identified structures, the only financially available option (with current known levels of investment) would be to follow the 'Do Nothing' scenario. This will require the installation of interim restrictive measures ranging from weight restrictions to full closures to all vehicular traffic. Such measures will require funding reducing available funding for preventative maintenance works to other structures assets across Suffolk. Additionally, should a structural failure occur this would require significant reallocation of funds, stagnating any investment in other structural assets and potentially impact on maintenance investments to other highway infrastructure assets.

g) What are the economic, environmental and social impacts of completing this project?

Bridges facilitate travel thus allowing consumers to purchase goods and services in their own communities and beyond. When a bridge closes, economic activity slows or grinds to a complete halt.

Bridges increase cash flow when they join two places that complement each other economically. It can have a powerful impact when an area that has a large money supply, such as London or the Golden Triangle, is well connected to one that can deliver goods or services (such as the Port of Felixstowe) or people who need work. With 48% of UK's food being imported, the resilience of our transportation network and reliability of the bridges supporting it are vital to ensuring disruptions of food distribution leading to cost increases and social issues are minimised.

Investment into Suffolk's structures assets will remove the cost and network occupancy required by unplanned and repetitive reactive works. Completing major refurbishment and replacement works will reduce overall disruption along strategic corridors reducing congestion and increased travel times associated with diversion routes and allowing unrestricted access to these critical routes. Managing a smaller number of closures to support substantial maintenance works allows the scheduling or phasing or works during times of the year when there is less demand, or undertaking work at night when traffic is low. Other direct benefits of planned works include:

- More efficient and effective use of resources (work, materials and equipment can be better profiled throughout the year);
- Early contractor involvement (improved buildability and reduced timescales);
- Improved safety of the public and workforce (time to plan versus reactionary works where time is more pressured); and
- Time to explore creative and innovative solutions and an increase of use of environmentally friendly materials and construction methods (delivering works with whole life cost benefits).

Substantial additional investment will support specialist supply chain partners locally through to the end of the current local highways maintenance funding period to 2020/21, where known investment levels are substantially less than previous years. This will ensure the viability and availability of these critical and specialist contractors into the future.

In summary, investment into Suffolk's critical structures infrastructure will:

- Prevent restrictive measures from being placed on critical structures assets;
- Improve unrestricted access and reliability of structures supporting international trade to and from the Port of Felixstowe, including non-EU trading partners through a possible post Brexit scenario and beyond; and
- Support national renewable energy infrastructure projects and supporting abnormal loads from Ipswich port to Suffolk and beyond.

B4. Equality Analysis

Has any Equality Analysis been undertaken in line with the Equality Duty? ☐ Yes ☒ No

The Equality Analysis will be undertaken as part of the detailed design stage, should funding be secured.

B5. The Commercial Case

This section categorises the procurement strategy that will be used to appoint a contractor and, importantly for this fund, set out the timescales involved in the procurement process to show that delivery can proceed quickly.

What is the preferred procurement route for the scheme? For example, if it is proposed to use existing framework agreements or contracts, the contract must be appropriate in terms of scale and scope.

Framework contract ☒

Direct labour ☐

Competitive tender ☐

**It is the promoting authority's responsibility to decide whether or not their scheme proposal is lawful; and the extent of any new legal powers that need to be sought. Scheme promoters should ensure that any project complies with the Public Contracts Regulations as well as European Union State Aid rules, and should be prepared to provide the Department with confirmation of this, if required. An assurance that a strategy is in place that is legally compliant and is likely to achieve the best value for money outcomes is required from your Section 151 Officer below.*

B6. Delivery of project

Are any statutory procedures, such as planning permission, required to deliver the project? If yes please provide details below;

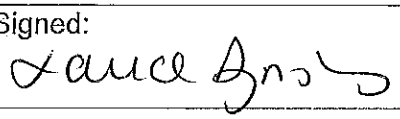
☒ Yes ☐ No

Details of statutory procedures before works can commence

Traffic Regulation Orders, railway possessions and land drainage consents will need to be obtained for some of the works during detail design and work mobilisation stages. These are typical statutory procedures that the council undertakes when maintenance and construction works are undertaken.

SECTION C: Declarations

C1. Senior Responsible Owner Declaration	
As Senior Responsible Owner for Major maintence to Suffolk's critical highway structures I hereby submit this request for approval to DfT on behalf of Suffolk County Council and confirm that I have the necessary authority to do so. I confirm that Suffolk County Council will have all the necessary powers in place to ensure the planned timescales in the application can be realised.	
Name: John Clements	Signed: 
Position: Head of Infrastructure Management	

C2. Section 151 Officer Declaration	
As Section 151 Officer for Suffolk County Council I declare that the scheme cost estimates quoted in this bid are accurate to the best of my knowledge and that Suffolk County Council - has allocated sufficient budget to deliver this scheme on the basis of its proposed funding contribution - will allocate sufficient staff and other necessary resources to deliver this scheme on time and on budget - accepts responsibility for meeting any costs over and above the DfT contribution requested, including potential cost overruns and the underwriting of any funding contributions expected from third parties - accepts responsibility for meeting any ongoing revenue requirements in relation to the scheme - accepts that no further increase in DfT funding will be considered beyond the maximum contribution requested - has the necessary governance / assurance arrangements in place - has identified a procurement strategy that is legally compliant and is likely to achieve the best value for money outcome - will ensure that a robust and effective stakeholder and communications plan is put in place	
Name: Louise Aynsley	Signed: 

Submission of bids:

The deadline for bid submission is 5pm on **31 October 2019**
Successful bids for Challenge Fund Tranche 2B are to be funded in 2019/20.
An electronic copy only of the bid including any supporting material should be submitted to:

roadmaintenance@dft.gov.uk copying in Paul.O'Hara@dft.gov.uk

Appendix A – Detailed list of the structures proposed for this scheme

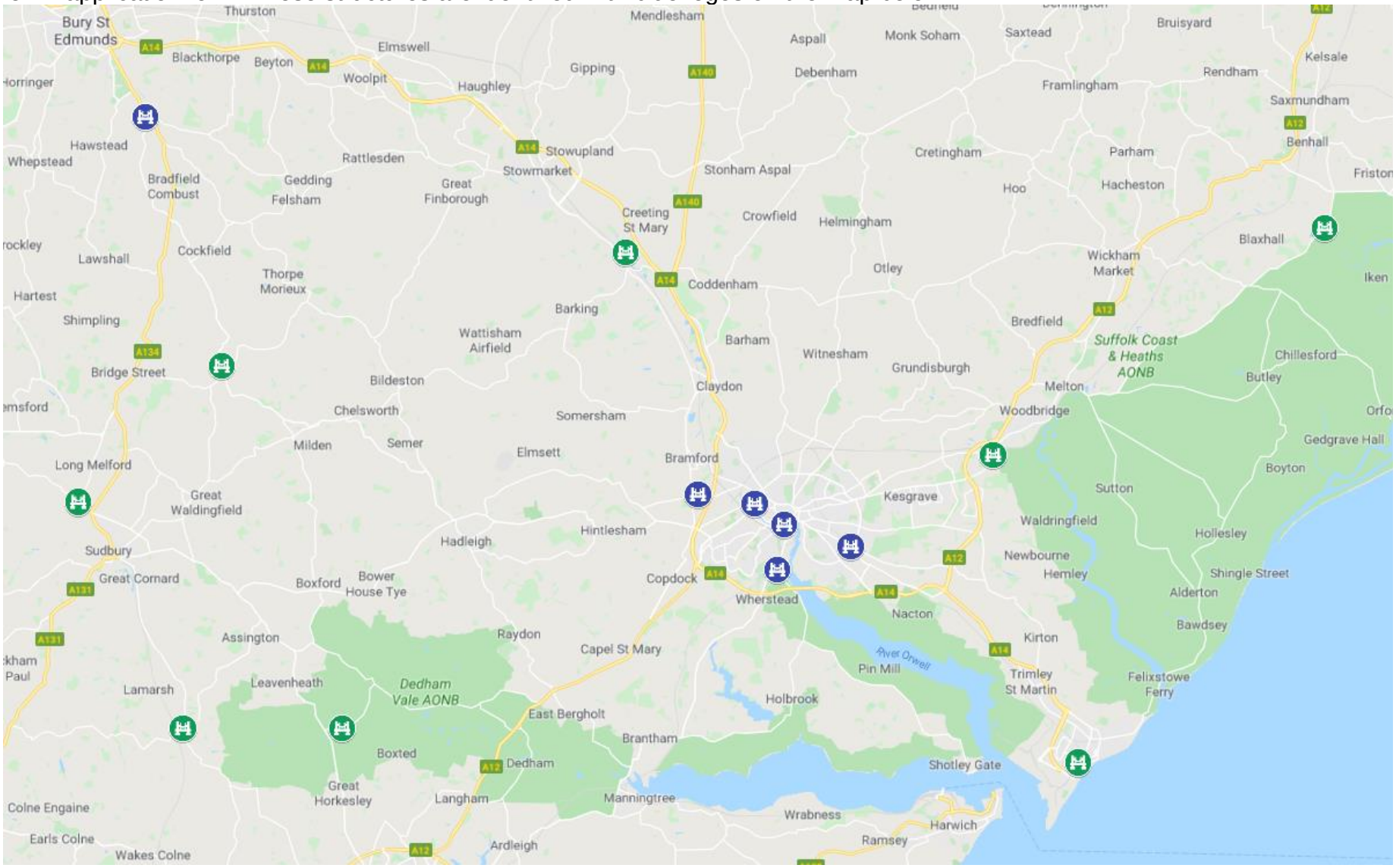
Structure Ref	Name / Location	Road carried	Route information	OS Grid Reference	Strategic Lorry Route	Part of Suffolk's Resilient Network?	Traffic data, AADT	Mean Average Speed on Route, kmh	Diversion Length, km	Average Delay Time, min	Under BD79 regime?	Proposed scenario	Cost Estimate	What are the current problems to be addressed by the proposed works? (Describe economic, environmental, social problems or opportunities which will be addressed by the scheme). Why the asset is in need of urgent funding?	Explain why the proposed works have not been undertaken previously and include evidence about how current problems are to be addressed	What options have been considered and why have alternatives have been rejected?	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)?	What are the expected benefits / outcomes? What are the economic, environmental and social impacts of completing this project?
54/37	**Sicklesmere Old Victoria Culvert**	A134	On a critical route. Important route linking Bury St Edmunds and Sudbury. Very long diversion route.	TL8788760368	Yes	Yes	10848	55	71.5	74	Monitoring Interim Measures	Rehabilitate	**£175,000**	The 44m-long, 1.75m-span masonry culvert with concrete pipe extension is believed to have been constructed circa 1960. A partial collapse of one section took place in 2005, requiring emergency repairs. The culvert is a confined space and is therefore difficult to inspect and maintain. The condition continues to deteriorate. The Principal Inspection undertaken in 2017 recommended further investigation, strengthening or replacement. There is a significant but unquantifiable risk of sudden collapse if strengthening works are not undertaken.	Further investigation, survey and preliminary design have been ongoing since 2017, including de-silting and a further Special Inspection in 2019. Outline design of a structural lining solution has been prepared which is currently progressing through the consent process. As an interim measure the culvert is subject to monitoring inspections at 3 month intervals, pending strengthening.	The cost of the works is significant in comparison to the normal levels of funding that are available for bridge maintenance. Strengthening and replacement options have been considered - strengthening with a structural liner offers the most cost effective solution and minimises traffic disruption during the works.	The bridge is currently being monitored at 3 month intervals to manage a significant but unquantifiable risk of sudden collapse and monitor the ongoing deterioration. In the likely event to of road closure, the diversion route and disruption will be significant. Any blockage of the culvert as a result of partial collapse is likely to result in flooding to properties. If funding is not secured to undertake the strengthening required the condition will deteriorate, which will result in a structural weight restriction having to be implemented within the next few years. Due to the extent of the defects, the length of the culvert, and the access difficulties, repairs are difficult and installation of a structural liner has been found to be the best strengthening option. A proactive approach needs to be taken to ensure that the bridge continues to be capable of sustaining unrestricted highway loading.	The bridge carries the A134, which is part of the Strategic Lorry Route in Suffolk. In the event of closure/weight restriction the alternative route is approximately 45 miles long.
75/16	**Yarmouth Rd, Ipswich**	A1214	Major crossing of River Gipping located in the middle of the town. On one of the diversion routes for A14 Orwell Bridge closures.	TM1501244789	N/A - Main HGV route within town centre	Yes	14097	37	2.1	45	No	Rehabilitate	**£400,000**	The 17.5m-long bridge over the river Gipping bridge was constructed in 1994. A Principal Inspection undertaken in 2017 identified that the bearings were in poor condition. A Special Inspection of the bearings was undertaken later in the same year to consider the condition of the bearings in greater detail . The Special Inspection indicated that 50% of the bearings had a remaining service life of between 5 - 7.5 years due to significant corrosion. There are 38 bearings in total that need replacing, together with joint replacement and re-waterproofing.	Some maintenance works were undertaken to the joints and bearings in 2018 to help control the rate of deterioration. Design of the works required to replace the bearings has been ongoing since 2017 - The design work is now 95% complete.	The cost of the works is significant in comparison to the normal levels of funding that are available for bridge maintenance. There is no certainty that the works will be affordable in future years due to other demands for bridge maintenance and strengthening. The bearings are reaching the end of their service life - replacement is the only option.	As the bearings have reached the end of the service life, their functionality is becoming substantially reduced, preventing the articulation and movement that was intended in the design. If the bearings are not replaced, the articulation, movements and loads induced by temperature changes and live loading will not be able to be accommodated. This is likely to result in damage to the substructure, which will require significantly more extensive, costly and disruptive works to rectify. Should significant defects result in a failure of the bearings, a structural weight restriction or closure may be required.	The bridge carries the A1214 over the River Gipping in the Town Centre. The A1214 is a vital part of the road network within the town centre - any weight restriction or closure would cause significant and widespread traffic disruption throughout the town centre.
82/25	**Ostrich Creek Bridge, Ipswich**	A137	Major route from A14 into town and docks that is also used for AIL movements out of Ipswich docks. Special Order route. On one of the diversion routes for A14 Orwell Bridge closures.	TM1612241969	N/A - Main HGV route within town centre	Yes	16828	41	12.4	50	No	Rehabilitate	**£175,000**	The 25m-span prestressed beam bridge was constructed in 1983. Testing has indicated very high chloride levels in the abutments and a high risk of corrosion to the reinforcement.	Some feasibility design into issues and options was undertaken in 2014, however undertaking protective measures to safeguard the condition and capacity of the bridge are currently unaffordable. As an interim measure the capacity of the bridge to carry AIL loading has been reduced to manage the risks.	Chloride induced corrosion of reinforcement is not readily visible. Further testing/investigation is required to develop the most appropriate maintenance strategy. It's likely that installation of preventative measures such as cathodic protection, protective coatings together with maintenance of the waterproofing and joints is likely to be the best means of ensuring that the load carrying capacity of the bridge is sustained.	High chloride levels are likely to lead to corrosion of the reinforcement in time that is often not visible. It would be beneficial to undertake some proactive preventative works to reduce the rate of deterioration. If funding is not secured and no action is taken within the next few years, the bridge will continue to degrade and the rate of deterioration is expected to accelerate significantly. A proactive approach needs to be taken to ensure that the bridge continues to be capable of sustaining unrestricted highway loading and is able to carry significant AILs to and from the nearby port.	The bridge carries the A137, which is a key route between the A14 and the town/docks and is often used for very large AIL movements. The capacity has currently been restricted to 30 Units of HB, which has meant that over-bridging has been required to accommodate some SO vehicle movements. This has lead to significant disruption.
89/05/F	**Coronation Drive, Felixstowe**	Footway/cycleway	Crosses a strategically important freight rail line. Busy route between seafront/amenities and residential area.	TM2950434179	No	No	N/A	N/A	1.6	20	Monitoring Interim Measures	Rehabilitate	**£250,000**	The riveted plate girder/jack-arch bridge is believed to have been constructed circa 1880. The Principal inspection undertaken in 2014 indicated that the structure was in 'a poor condition with a number of defects which require attention. It was also advised that measures should be taken to prevent vehicular access to the bridge. Many of the wrought iron elements have significant corrosion and section loss and there are numerous defects in the masonry abutments and wingwalls that need repair. The paint system has completely failed in numerous locations leading to corrosion and significant section loss of the steel members. The condition is rapidly deteriorating. Major maintenance is required to stabilise the existing structure and extend its service life.	As an interim measure bollards have been installed to prevent vehicles from accessing the bridge, and the bridge is subject to monitoring inspections at 6 month intervals. A structural assessment was undertaken in 2018 to verify the capacity of the deck taking account of the section loss that has taken place to the primary structural elements. It was found that the bridge is still capable of taking pedestrian loading provided no further deterioration takes place. The refurbishment works have been designed and were planned to be completed in stages throughout 2019/20 - The works have had to be postponed due to insufficient funding in 19/20. Some of the works will require railway possessions. The Basic Asset Protection Agreement (BAPA) is already in place for the works.	The cost of the works is significant in comparison to the normal levels of funding that are available for bridge maintenance. The works have been designed, and were programmed to be undertaken in 2019/20/21 - The funding for 2019/20 is not sufficient and therefore the site works have had to be postponed - There is no certainty that the works will be affordable in future years. Repairs/refurbishment is considered to be the most cost effective solution, however it needs to be undertaken now to prevent any further deterioration.	The bridge has been monitored at 6 month intervals for the past 12 years pending major refurbishment. Failure to undertake refurbishment work to prevent the long-standing and ongoing deterioration of the structure will run the risk of masonry or steel elements falling onto the Felixstowe branch rail line below, which is of national importance since it connects the Port of Felixstowe to the wider rail network and is the start of the Felixstowe to West Midlands and North freight route (the F2N corridor). If refurbishment works are undertaken now the bridge will still be able to carry pedestrian loading without significant strengthening, however if left for much longer, more significant strengthening works will be required.	The bridge carries a cycleway/footway over the railway forming a busy link between a large residential area and the sea-front area and amenities. If the bridge were to be closed it would involve a mile-long diversion (for pedestrians/cyclists) on less suitable routes.
75/28	**Stoke Bridge, Ipswich**	A137	Major crossing over River Orwell located in the centre of Ipswich. Suspension of the Upper Orwell Crossing project in Ipswich means that the route will continue to be an important zone distributor with a likely increase of the traffic flow.	TM1633843946	N/A - Main HGV route within town centre	Yes	21876	21	12.4	50	No	Rehabilitate	**£800,000**	The bridge was constructed in 1924, with the last major maintenance undertaken in 2007. The Principal Inspection undertaken in 2015 indicated that there is extensive and widespread cracking and spalling of the reinforced concrete elements, and recommended that a programme of concrete repairs needs to be undertaken together with consideration of other preventative measures to slow down the rate of deterioration.	Further testing and inspection is required to confirm the scope of the repairs required and to determine what the best long-term strategy is for the bridge. This testing/inspection is planned to be undertaken in 2019/20.	The costs associated with undertaking the repairs required and probable installation of preventative measures to slow the rate of deterioration such as replacing the waterproofing and movement joints, the installation of cathodic protection measures, and the application of protective coatings will be significant. It will be difficult to fund this work within the constraints of normal capital funding budgets. (Whilst a whole life cost analysis is required to identify the best maintenance strategy, reconstruction costs would be unaffordable, and the disruption caused by such works would be significant.)	The rate of deterioration is expected to accelerate significantly if no action is taken within the next few years. A proactive approach needs to be taken to ensure that the bridge continues to be capable of sustaining unrestricted highway loading. Weight restriction will be required if condition continues to deteriorate without major refurbishment being undertaken. The bridge carries a key-route into the town centre, hence any weight restriction or closure would cause significant and widespread disruption to traffic flows in the town.	The bridge carries the A137 over the River Orwell in the Town Centre. The A137 is a vital part of the road network within the town centre and forms part of Suffolk's Resilient Network. Any weight restriction or closure would cause significant and widespread traffic disruption throughout the town centre and wider afield.
60/13	**North of Snape Bridge**	B1069	Local importance. The B1069 is an important part of the highway network in east Suffolk. The bridge is located a short distance to the north of Snape Maltings, which is a major tourist attraction. The alternative diversion route is more than 15 miles in length.	TM3922757734	Yes	No	4928	54	22.4	25	Monitoring interim measures	Rehabilitate	**£100,000**	Recent assessment of the masonry arch bridge has indicated an assessed rating of 3T.	A BD79 review has been undertaken which has indicated that the structure needs to be strengthened. Monitoring inspections are to be undertaken pending strengthening and all AIL movements over the bridge have been stopped.	It might be possible to strengthen the arch by lining or haunching with concrete, alternatively reconstruction will be required.	Interim measures will need to remain in place until the bridge has been strengthened or reconstructed. A structural weight restriction will need to be implemented if strengthening is not undertaken within the near future.	The B1069 is an important part of the highway network in east Suffolk. The bridge is located a short distance to the north of Snape Maltings, which is a major tourist attraction. The alternative diversion route is more than 15 miles in length.
64/23	**Lavenham Rail Bridge**	A1141	The A1141 is an important part of the highway network in Central Suffolk. The bridge is situated on the outskirts of Lavenham, which is a major tourist attraction. The alternative diversion route is more than 50 miles in length.	TL9164649745	Yes	No	2417	48	54.7	56	Under monitoring. Scheduled for BD79 review	Rehabilitate	**£100,000**	8m span masonry arch over a disused railway line, believed to have been constructed over 150 years ago. Assessment failure =33T. The Principal Inspection undertaken in 2018 indicated that the masonry on the intrados of the arch is deteriorating with significant areas of delaminated masonry. The structure is monitored every 12 months and is in the list for BD79 review.	Interim measures will be considered as part of the BD79 review.	It is considered likely that it will be possible to strengthen the arch.	Interim measures will need to remain in place until the bridge has been strengthened.	The A1141 is an important part of the highway network in Central Suffolk. The bridge is situated on the outskirts of Lavenham, which is a major tourist attraction. The alternative diversion route is more than 50 miles in length.

Structure Ref	Name / Location	Road carried	Route information	OS Grid Reference	Strategic Lorry Route	Part of Suffolk's Resilient Network?	Traffic data, AADT	Mean Average Speed on Route, kmh	Diversion Length, km	Average Delay Time, min	Under BD79 regime?	Proposed scenario	Cost Estimate	What are the current problems to be addressed by the proposed works? (Describe economic, environmental, social problems or opportunities which will be addressed by the scheme). Why the asset is in need of urgent funding?	Explain why the proposed works have not been undertaken previously and include evidence about how current problems are to be addressed	What options have been considered and why have alternatives have been rejected?	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)?	What are the expected benefits / outcomes? What are the economic, environmental and social impacts of completing this project?
85/01	**Bures**	B1081	Important crossing of River Stour in the centre of the village. Very long diversion route. High local importance.	TL9062934038	Yes	No	2395	36	44.9	55	Under monitoring. Scheduled for BD79 review	Rehabilitate	**£300,000**	The 20.7m span cast iron bridge was constructed circa 1881, with major strengthening works undertaken in 1991 including the addition of steel plates to the lower flanges of the cast iron girders. These plates are now deteriorating. The Principal Inspection undertaken in 2018 indicated it is in poor condition and requires major refurbishment. The protective paint protection system to the cast iron and steel elements has failed in places allowing corrosion to start. It recommended that the beams are re-painted and that the deck waterproofing system is replaced. Extensive temporary scaffolding will be required to undertake the painting works. The structure is qualitatively monitored every 6 months and is in the list for BD79 review.	The works are programmed to be undertaken in two stages, during the school summer holiday periods to minimise disruption. First, re-waterproofing of the deck, and then repainting the cast iron and steel elements. Whilst the bridge is currently considered to be safe for use without weight restriction, it is essential that maintenance is undertaken promptly. The painting works will require extensive temporary works to gain access and manage the environmental issues. The waterproofing works were designed and programmed to be undertaken in Summer 2019, with painting works programmed for summer 2020/21 - The works had to be postponed due to insufficient funding in 2019/20. EA consent will be required for the temporary works.	The cost of the works is significant in comparison to the normal levels of funding that are available for bridge maintenance. The works have been designed, and were programmed to be started in Summer 2019 The funding for 2019/20 is not sufficient and therefore the site works have had to be postponed - There is no certainty that the works will be affordable in future years. Major refurbishment is considered to be the most cost effective solution, however it needs to be undertaken now to prevent any further deterioration.	The primary elements are cast iron, which are prone to brittle failure, and therefore a conservative and proactive approach needs to be taken in relation to the management of this structure. The condition has reached a stage where there is increasing concern over the integrity of the connections between the beams and the plate bonding. If funding is not secured to undertake the repairs required within the next 2 years, the condition will deteriorate rapidly such that a reassessment will be required, which is likely to result in interim measures (weight restriction, or closure) instigated.	The bridge carries the B1081 over the River Stour in the centre of Bures on the County Boundary between Suffolk & Essex. In the event of closure/weight restriction the alternative route is approximately 30 miles long, via Colchester. There are very few crossings of the River Stour that are suitable for HGV traffic in this part of the County.
75/26	**Felixstowe Road Rail Bridge**	A1156 over Ipswich to Felixstowe rail line.	Crosses a strategically important freight rail line.	TM1924843099	N/A - Main HGV route within town centre	Yes	15071	29	7.7	50	Under monitoring. Scheduled for BD79 review	Rehabilitate	**£450,000**	The 13.4m span reinforced concrete portal structure was built in 1929 and crosses the Ipswich-Felixstowe railway line. Extensive concrete repairs were undertaken in 1987. The Assessed capacity under Accidental Wheel loading on the footways is 7.5T. The footways are readily accessible by vehicles. The Principal Inspection undertaken in 2017 indicated that the condition has deteriorated since the assessment was undertaken and that the condition factor has fallen from 1.0 to 0.9. The bridge needs to be strengthened or measures taken to prevent vehicles accessing the footways.	There is currently insufficient funding available to strengthen the bridge or implement measures to prevent Accidental Wheel loading on the footways. A BD79 review is about to be undertaken to determine how to manage this sub-standard structure.	It's unlikely that it will be feasible to prevent Accidental vehicle loading on the footways without restricting the number of lanes of traffic, which would lead to significant disruption/delays. Strengthening is likely to be required.	A failure to mitigate the cause of assessment failure might lead to a failure, which is likely to affect the movements on the Felixstowe branch rail line below the bridge. Felixstowe branch line is of national importance since it connects the Port of Felixstowe to the wider rail network and is the start of the Felixstowe to West Midlands and North freight route (the F2N corridor)	The bridge carries the A1156 over the Ipswich-Felixstowe railway line on the outskirts of the town. The road is a key distributer road into the Town, closure or weight restriction would result in significant disruption/delays.
56/17	**St Marys bridge Needham Market**	C490	Local importance. The bridge is the only means of access to a number of properties that does not involve using a very low height bridge (8') on the road to the south.	TM0894555405	No	No	6947	37	3.9	7	Under monitoring. Scheduled for BD79 review	Replace	**£1,030,000**	The 3-span reinforced concrete structure built in 1922 has had repairs undertaken in 2005, 2008, and 2011 to extend its service life. The bridge is reaching the end of its service life and is in need of replacement. The bridge has substandard concrete parapets and assessed capacity of 18T. The structure is monitored every 12 months and is in the list for BD79 review.	Some feasibility design in to strengthening and replacement options has been undertaken.	The cost of the strengthening works required are significant in comparison to the normal levels of funding that are available for bridge maintenance. The interim measures (monitoring) that have been undertaken are not a long-term solution.	The bridge is being monitored at 3-month intervals, as an interim measure, pending reconstruction. Weight restriction will be required, if funding is not secured and major strengthening or reconstruction is not undertaken.	Works are required to manage the risks associated with the weak elements of the bridge in the longer-term.
76/22	**Martlesham**	C376	On HGV construction access route for East Anglia 1 offshore windfarm. Busy C road	TM2525047300	No	No	6938	48	5.1	6	Under monitoring. Scheduled for BD79 review	Rehabilitate	**£175,000**	7.5m span reinforced concrete portal frame bridge, constructed in 1928. The bridge has an assessed capacity of 3T below the footways under Accidental Wheel loading. The footways are readily accessible to vehicles. The structure is monitored every 12 months and is in the list for BD79 review.	Interim measures will be considered as part of the BD79 review.	The bridge will either need to be strengthened, measures taken to prevent Accidental Wheel loading on the footways, or reconstructed.	Interim measures will need to remain in place until the bridge has been strengthened.	Works are required to manage the risks associated with the weak elements of the bridge in the longer-term.
75/06	**Sproughton bridge**	C442	Significant crossing of the River Gipping on the outskirts of Ipswich forming an important route into town.	TM1254045070	No	No	6144	46	8.2	10	Load Mitigating Interim Measures: 7.5t weight restriction	Rehabilitate	**£370,000**	The 3-span reinforced concrete structure over the River Gipping was constructed in 1927. The assessed capacity is dead and superimposed dead load only under the south footway, 18T under the north edge beam and 26T for the internal beams under the carriageway. The bridge also has sub-standard timber parapets.	The bridge is currently subject to a 7.5T structural weight restriction and bollards have been erected as an interim measure to reduce the risk of vehicles accessing the weak south footway. Some feasibility design in to strengthening and replacement options has been undertaken.	The cost of the strengthening works required are significant in comparison to the normal levels of funding that are available for bridge maintenance. The interim measures that have been undertaken are not a long-term solution.	The sub-standard timber parapets present a significant risk, as do the weak members below the south footway. The structure is currently subject to a 7.5T structural weight restriction with temporary bollards installed as an interim measure to reduce the risk of vehicles accessing the weak south footway. Currently monitored every 6 months. Due to the very weak members below the footway, a significant risk remains despite the interim measures that have been implemented. It is considered that strengthening together with the installation of a vehicle restraint system offers the most cost effective solution.	Works are required to manage the risks associated with the weak elements of the bridge in the longer-term.
72/07	**Rod bridge Long Melford**	C676	Significant crossing of River Stour between Essex and Suffolk.	TL8567743621	No	No	260	34	18.5	17	Scheduled for BD79 review	Replace	**£920,000**	The 3-span reinforced concrete structure built in 1913 has a temporary panel (bailey type) bridge installed in 1998 over the top of the existing bridge supported on the existing bridge piers and abutments. The panel bridge is only a temporary solution and has a priority system in place with a single lane of traffic-flow. Full reconstruction of the bridge is required. A risk to the public is imposed by the absence of the vehicle impact protection parapets that are optional for this type of temporary bailey bridge construction form. The structure is in the list for BD79 review.	Some feasibility design into reconstruction options has been undertaken.	The cost of the works required are significant in comparison to the normal levels of funding that are available for bridge maintenance. The interim measures that have been undertaken are not a long-term solution.	The structure is currently monitored at 12-month intervals due to concerns over its condition and capacity. Panel bridge requires frequent maintenance and the main structure members have no protection from vehicular impact. If funding is not secured to replace the panel bridge or construct a new bridge, the road will need to be closed in foreseeable future.	The bridges provides a crossing over the River Stour on the County boundary between Suffolk and Essex. In the event of closure the alternative diversion route is 12 miles in length.
86/12	**Mill Street, Nayland**	C756	Located in the centre of the village forming an important route for residents, schools and businesses.	TL9751734324	No	No	2403	22	1.8	3	Load Mitigating Interim Measures: Access Restriction with Bollards	Rehabilitate	**£300,000**	The 9m-span cast iron bridge carries a road over a mill race directly in front of the mill building. A structural assessment has indicated that a section of the deck has no capacity to take live loading. Bollards have been erected as an interim measure to deter vehicles from loading the weak elements of the bridge. It is a confined space requiring a dive-team for access, making inspection/maintenance difficult. The Principal Inspection undertaken in 2017 indicated that the cast iron elements were in poor condition with significant corrosion/section loss, significant defect were also found in the masonry abutments. Scour was also found to be present.	As any interim measure, bollards have been erected to prevent vehicular access to the weak area of the deck. Further investigation and survey work have been undertaken since the 2017 Principal Inspection and design of reconstruction works is currently underway.	The cost of the works is significant in comparison to the normal levels of funding that are available for bridge maintenance. The works were programmed to be undertaken in Autumn 2019 - The funding for 2019/20 is not sufficient and therefore the site works have had to be postponed - There is no certainty that the works will be affordable in future years. The cast iron elements are beyond repair and reconstruction is considered to be the most cost effective long-term solution, however it needs to be undertaken now to ensure that the bridge remains safe for use.	The primary and secondary elements of the deck are cast iron, which are prone to brittle failure, and therefore a conservative and proactive approach needs to be taken in relation to the management of this structure. The underside of the bridge is a confined space requiring a dive-team to undertake any inspection/monitoring. If funding is not secured to enable the weak section of the deck to be reconstructed, a weight restriction or closure will be required to manage the risks. The closure would prevent access to the Mill property, which is currently used by a business.	The bridge is located in the centre of the village of Nayland and forms an important link for residents, businesses and the nearby school. The bridge is also located directly In front of the Mill building and forms the main access into the front of the building.

CHALLENGE FUND BID INF Indicative E **£5,545,000**

Appendix B – Location of the structures proposed for this scheme

A representative sample of structures were used to produce proformas that accompany the Local Highways Maintenance Challenge Fund Tranche 2B application form. These structures are identified with blue logos on the map below.



Appendix C - Condition and load-bearing capacity of highway structures

C1. Condition and load-bearing capacity of highway structures

C1.1. Introduction

The County Surveyors' Society (CSS) Guidance Document for Performance Measurement of Highway Structures provides a standardised framework for identifying and recording the condition of all elements of a highway structure. This guidance is commonly used by highway authorities and has been adopted by Suffolk County Council (SCC).

The reporting system proposed in the guidance breaks down structures into a standardised set of elements and uses a common method of reporting the condition of each element by means of defect severity and extent reported during the latest inspection. The system also considers importance of an element in terms of load carrying capacity, durability and public safety. This and other information collated during inspections are then used to produce two different Condition Performance Indicator (Condition PI), formerly known as Bridge Condition Indicators (BCI), for both individual structures and stock of structures:

- The Average Condition PI (Condition PI_{Av}) for an individual structure, which considers all elements, and provides an overview of the average structure condition; and
- The Critical Condition PI (Condition PI_{Crit}), which is based on the condition of only those elements that have a Very High importance classification.

The Condition PI_{Av} alone may not give a complete picture of the health of a structure. For example, a structure may have a high Condition PI_{Av} score implying it is in a very good condition, however, the structure may be close to collapse if, for instance, one of the critical elements is in very poor condition, hence the need for the Condition PI_{Crit}. On the other hand, Condition PI_{Crit} although giving an indication of the criticality of the structure, does not provide an indication of how widespread the deterioration is over the whole structure. Therefore, both of these indicators should be used to obtain a more complete picture of the health of a structure.

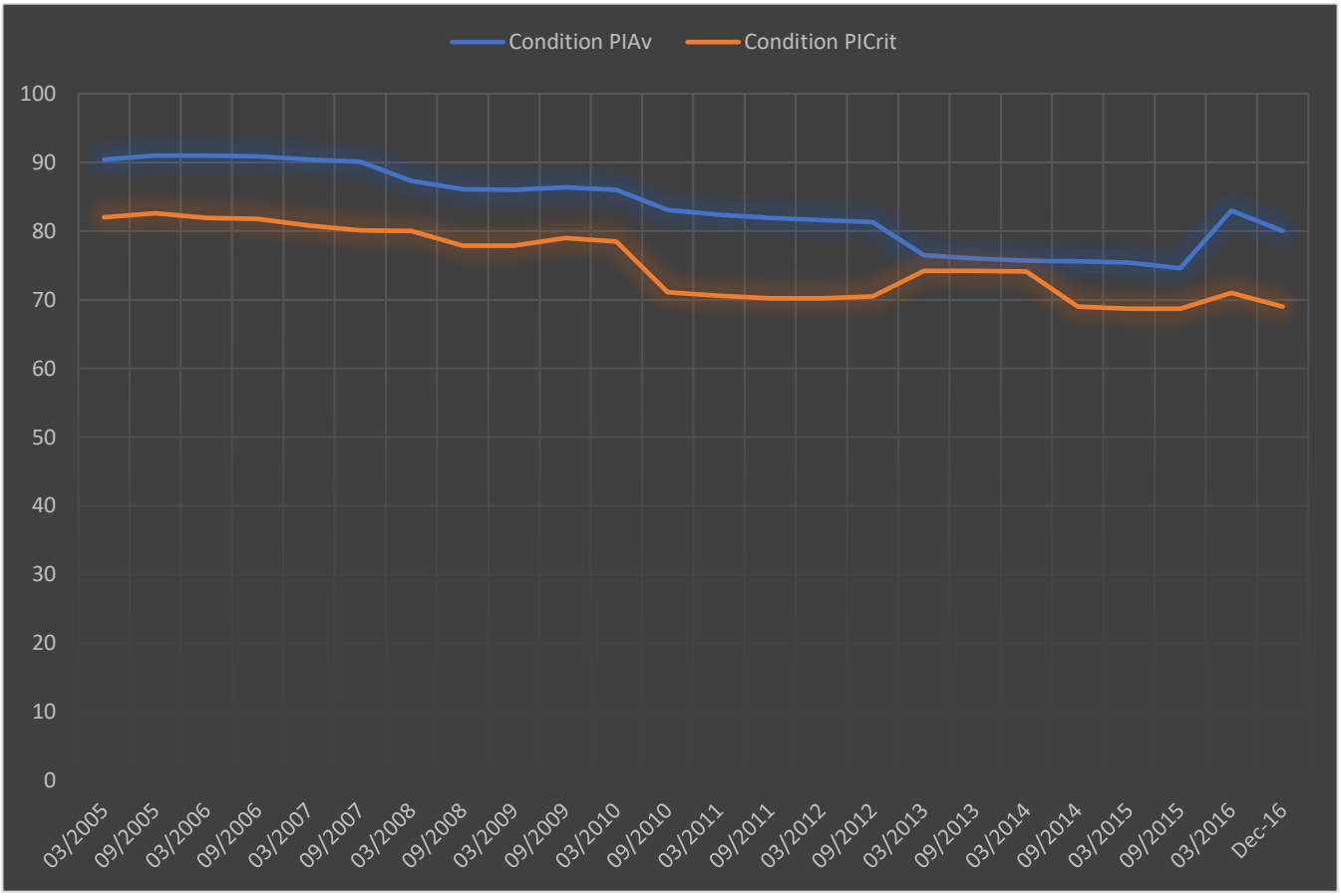
The interpretation of the Average and Critical Structure Stock Condition PI values in terms of the general condition of the stock is given in the table below. These interpretations are based on experience to date with the CSS Bridge Condition Indicator and are only provided as broad guidelines. The characteristics of individual stocks mean they may not adhere to the descriptions provided and it is down to the experience and knowledge of the local engineer(s) to interpret the Condition PI and the significance of changes and trends.

Score	Average Stock Condition	Critical Stock Condition	Addition Comments
Very Good **90 ≤ x ≤ 100**	The structure stock is in a very good condition. Very few structures may be in a moderate to severe condition.	A few critical load bearing elements may be in a moderate to severe condition. Represents very low risk to public safety.	If it is a relatively new stock of structures then an appropriate maintenance funding level needs to be identified through Asset Management. If it is a mature stock then continuing with the same level of funding is likely to sustain a high condition score and an effective preventative maintenance regime. If not already in place, appropriate asset management practices should be implemented to identify the optimum condition for the stock and the associated level of funding.
Good **80 ≤ x < 90**	Structure stock is in a good condition. Some structures may be in a severe condition.	Some critical load bearing elements may be in a severe condition. Some structures may represent a moderate risk to public safety unless mitigation measures are in place.	As a minimum the current level of funding should be continued, however it may be unclear if this is the appropriate level of funding. If not already in place, appropriate asset management practices should be implemented to identify the optimum condition for the stock and the associated level of funding. There is the potential for rapid decrease in condition if sufficient maintenance funding is not provided. Minor to Moderate backlog of maintenance work.
Fair **65 ≤ x < 80**	Structure stock is in a fair condition. A number of structures may be in a severe condition.	A number of critical load bearing elements may be in a severe condition. Some structures may represent a significant risk to public safety unless mitigation measures are in place.	Historical maintenance work under funded and structures not managed in accordance with Asset Management. It is essential to implement Asset Management practices to ensure work is adequately funded and prioritised and risks assessed and managed. Moderate to large backlog of maintenance work, essential work dominates spending.
Poor **40 ≤ x < 65**	Structure stock is in a poor condition. Many structures may be in a severe condition.	Many critical load bearing elements may be unserviceable or close to it and are in a dangerous condition. Some structures may represent a high risk to public safety unless mitigation measures are in place.	Historical maintenance work significantly under funded and a large to very large maintenance backlog. An Asset Management approach must be implemented. Re-active approach to maintenance that has been unable to contain deterioration. A significant number of structures likely to be closed, have temporary measures in place or other risk mitigation measures. Essential work dominates spending.
Very Poor **0 ≤ x < 40**	Structure stock is in a very poor condition. Many structures may be unserviceable or close to it.	Majority of critical load bearing elements unserviceable or close to it and are in a dangerous condition. Some structures may represent a very high risk to public safety unless mitigation measures are in place.	Historical maintenance work grossly under funded and a very large maintenance backlog. Re-active approach to maintenance that has been unable to prevent deterioration, only essential maintenance work performed. An Asset Management approach must be implemented. Many structures likely to be closed, have temporary measures in place or other risk mitigation measures. All spend likely to be on essential maintenance.

C1.2. The current state of structure stock's condition

The figure below demonstrates the Average and Critical Structure Stock Condition PI values for structures carrying roads, footways, and cycleways in Suffolk dating back to 2005. As part of the development of SCC's Highways Infrastructure Asset Management Plan in early 2016, the definition of the 'Structures Asset Group' was amended, which affected the number of structures considered and, consequentially, resulted in an apparent rise of the indicators.

Due to the reduced functionality of Suffolk's current Bridge Management System, migration of the data held in it to a new asset information management system and labour-intensive manual calculations involved in determining of the condition indicators, the condition data presented below is based on the latest (December 2016) information that is readily available, however, the 'general picture' has not changed since then and a steady decline in the condition of the bridge stock is being observed.



The graph shows a fairly consistent rate of deterioration in condition of highway structures over an extended period, with both of the stock indicators now within the 'fair' banding, and the critical stock indicator value expected to drop into the 'poor' banding within the next few years.

The stock indicator values only provide an overview of the general condition of the bridge stock and the overall rate of deterioration. It is necessary to look at individual Condition PI values for each structure to get a better understanding of the condition of the structures. The table below provides a more detailed breakdown of the Condition PI values.

Condition Band	Condition PI_{Av}		Condition PI_{Crit}	
	No. of structures	%	No. of structures	%
Very good (90 - 100)	268	15.7	366	21.5
Good (80 - 89)	621	36.5	304	17.9
Fair (65 - 79)	673	39.6	462	27.2
Poor (40 - 64)	133	7.8	375	22.0
Very poor (0 - 39)	6	0.4	194	11.4

The Critical Structure Stock Condition PI demonstrates that over a third of the very important elements are in 'Poor' and 'Very poor' condition bands.

C2. Highway structures with sub-standard load carrying capacity

C2.1. Introduction

The 'Authorised Weight Regulations' enables vehicles up to a gross vehicle weight of 44T, and with maximum axle loads of 11.5T to use the highway network. Suffolk's newer structures have been designed to take this loading, and its older structures have been assessed to determine if they can sustain the loads from these vehicles.

There is a structural review process in place, whereby changes in use, loading, or condition are reviewed to determine whether the assessed or design capacity of a structure is still valid, or re-assessment is required. Change in use and loading are uncommon, however any significant deterioration in condition of the primary load-carrying elements of a structure is likely to reduce its load carrying capacity.

Similarly, there is a review process in place for managing structures that are found to be sub-standard following assessment. This process adopts a risk-based approach to identifying a management strategy for sub-standard and provisionally substandard structures with an appropriate interim measure (where required) to ensure the safety of the public. The management strategies for such structures include the following:

- If the risk to the public is acceptably low, this is substantiated and recorded in the risk assessment, which is then subject to periodic review;
- If the risks are unacceptable, a structural weight restriction is placed on the bridge, or other interim measures are implemented such as propping, traffic management, or monitoring pending strengthening works. Ultimately, the road may have to be closed.

In some cases, implementing a permanent structural weight restriction might be acceptable in the longer term (e.g. when the cost of strengthening or reconstruction are disproportionately high and the need to carry full highway loading is deemed to be low, or when there are suitable alternative routes for larger vehicles). In other cases, structural weight restrictions are used as an interim measure.

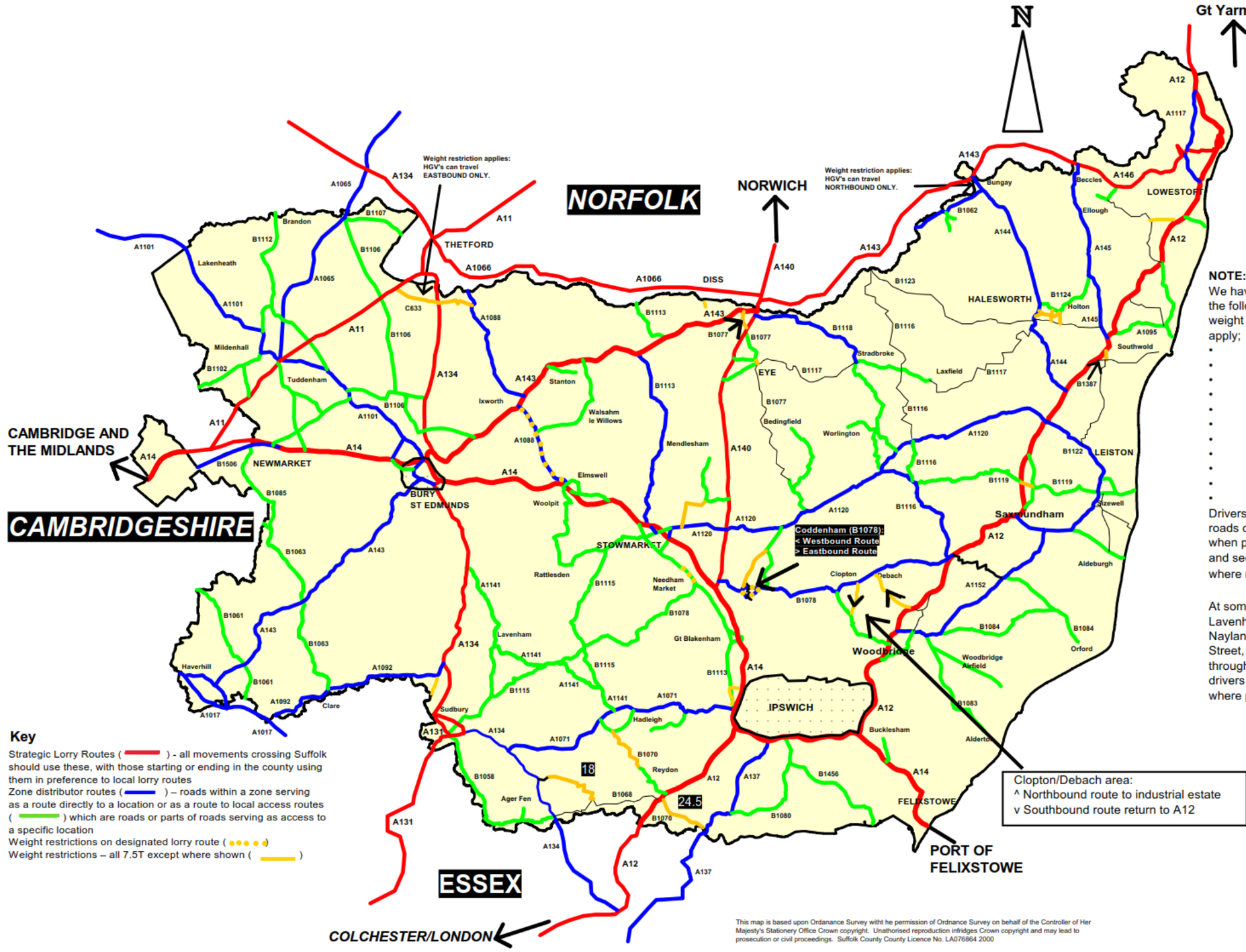
C2.1. The current position

There has been a 15% increase in the past 1.5 - 2 years in the number of sub-standard and provisionally sub-standard structures, where interim measures are already in place. As of October 2019, there are currently 133 such structures, of which 16 have structural weight restriction implemented.

Appendix D - Extents of a severe congestion caused by Orwell bridge closure

Traffic is beginning to build up around Ipswich due to the Orwell Bridge's closure by Storm Gareth winds. Pictures: GOOGLE MAPS

Appendix E – Suffolk's Strategic Lorry Route network



NOTE:
We have Lorry Watch scheme's in the following areas where 7.5T weight restriction traffic orders apply;

- Beccles
- Bungay
- Claydon
- Coddenham
- Eye
- Gt Waldringfield
- Hadleigh
- Holton
- Leiston
- Palgrave
- Sproughton

Drivers should ensure that the roads concerned are only used when permitted under the Order and seek an alternative route where necessary.

At some locations such as Clare, Lavenham, Coddenham, Stoke by Nayland, Nayland and Benton Street, Hadleigh routes pass through historic villages where drivers should take extra care and where possible avoid

Key

Strategic Lorry Routes ( ) - all movements crossing Suffolk should use these, with those starting or ending in the county using them in preference to local lorry routes
Zone distributor routes ( ) – roads within a zone serving as a route directly to a location or as a route to local access routes ( ) which are roads or parts of roads serving as access to a specific location
Weight restrictions on designated lorry route ( )
Weight restrictions – all 7.5T except where shown ( )

Appendix F – The results of lifecycle planning analysis undertaken for the proposed structures

The most recent Principal and General Inspection information was used for the lifecycle planning analysis undertaken for the proposed structures using the Structures Toolkit. The toolkit allows the consideration of the future condition of structures, over a 30-year period, based on different investment scenarios. This provides practitioners with an essential evidence base to support the right investment decisions at the right time.

By running various maintenance and budget scenarios, the Toolkit enables the development of multiple lifecycle plans. These scenarios determine the level of investment required to maintain a certain level of performance, or conversely, illustrate the effects of budget constraints on performance.

The scenarios analysed using the Toolkit are listed in the table below. The analysis, for the purposes of this submission, sought to quantify possible saving that could be achieved by investing into the assets rather than to develop lifecycle plans for these structures.

Scenario	**Maintenance Strategy selected in the Structures Toolkit**	**Capital budget available to undertake works prioritised by the Toolkit**	**Capital budget allocated to undertake reinstatement works proposed by this scheme**
Do Nothing	Planned Do Minimum	£0 (years 1 to 30)	£0 (years 1 to 30)
Do Something	Planned Do Minimum	£0 (years 1 to 30)	£5,545,000 (year 1) £0 (years 2 to 30)

The table below summarises the key findings of the scenarios analysed by the Toolkit. It is followed by another two tables overleaf that provide more detailed summary of the outcomes of each scenario analysis.

	Do Nothing	**Do Something**
Total Shortfall in year 30	£26,178,595	£8,742,144
Total Investment made in 30 years	£-	£5,545,000
Accumulated Traffic Delay Cost	£5,281,584	£562,902
Total Cost to the Public	£31,460,179	£14,850,046

A saving of £16.6 million is likely to be achieved by investment into the 'Do Something' scenario. This figure is evaluated as the difference in the Total Cost to the Public of ‘Do Nothing’ and ‘Do Something’ scenarios.

Scenario		Do Nothing											
Year	Budget	Expenditure	Number of Structures in the…					$SSCI_{av}$	$SSCI_{crit}$	Shortfall	No. of Structures at Risk	Traffic Delay Cost	Upgrades, Improvements & Lifecycle Plans (Capital)
			'Very Good' condition band	'Good' condition band	'Fair' condition band	'Poor' condition band	'Very Poor' condition band						
0			0	1	6	7	0	68.3	44.5	£-	0.0	£-	
1	£-	£-	0	1	6	6	1	67.3	42.9	£2,203,816	7.0	£50,458	£-
2	£-	£-	0	1	5	7	1	65.6	39.7	£2,762,996	8.0	£68,619	£-
3	£-	£-	0	1	5	7	1	63.8	36.9	£3,362,109	8.0	£124,183	£-
4	£-	£-	0	1	2	10	1	62.3	34.3	£5,260,138	8.0	£135,080	£-
5	£-	£-	0	1	2	10	1	60.1	33.9	£6,561,528	8.0	£135,080	£-
6	£-	£-	0	0	3	8	3	57.9	33.9	£6,970,839	8.0	£135,080	£-
7	£-	£-	0	0	3	8	3	55.6	32.2	£8,439,133	9.0	£145,977	£-
8	£-	£-	0	0	2	9	3	53.7	32.2	£11,150,754	9.0	£145,977	£-
9	£-	£-	0	0	2	8	4	51.6	30.5	£11,626,623	9.0	£145,977	£-
10	£-	£-	0	0	2	8	4	48.9	27.1	£12,385,119	11.0	£156,874	£-
11	£-	£-	0	0	2	8	4	47.5	25.5	£13,113,920	11.0	£156,874	£-
12	£-	£-	0	0	2	8	4	46.0	23.9	£14,048,558	11.0	£167,771	£-
13	£-	£-	0	0	2	7	5	45.0	23.4	£15,515,926	11.0	£167,771	£-
14	£-	£-	0	0	1	8	5	42.7	22.6	£15,550,320	11.0	£167,771	£-
15	£-	£-	0	0	1	7	6	40.4	20.1	£16,056,616	11.0	£167,771	£-
16	£-	£-	0	0	1	6	7	38.5	18.8	£16,493,861	11.0	£200,461	£-
17	£-	£-	0	0	1	5	8	37.4	18.8	£17,108,470	11.0	£200,461	£-
18	£-	£-	0	0	1	3	10	35.8	16.8	£18,255,790	11.0	£200,461	£-
19	£-	£-	0	0	1	2	11	33.3	16.8	£18,309,900	11.0	£200,461	£-
20	£-	£-	0	0	1	2	11	30.4	14.0	£19,751,444	11.0	£214,990	£-
21	£-	£-	0	0	1	2	11	28.9	14.0	£19,802,748	11.0	£214,990	£-
22	£-	£-	0	0	1	2	11	27.8	13.4	£20,724,521	11.0	£214,990	£-
23	£-	£-	0	0	1	1	12	26.0	13.4	£20,799,456	11.0	£214,990	£-
24	£-	£-	0	0	1	0	13	24.1	12.3	£20,999,216	11.0	£214,990	£-
25	£-	£-	0	0	0	1	13	22.3	12.3	£21,986,976	11.0	£214,990	£-
26	£-	£-	0	0	0	1	13	20.1	9.7	£23,080,768	11.0	£214,990	£-
27	£-	£-	0	0	0	1	13	19.6	7.8	£24,515,834	12.0	£225,887	£-
28	£-	£-	0	0	0	1	13	19.1	7.8	£24,950,811	12.0	£225,887	£-
29	£-	£-	0	0	0	1	13	18.4	7.8	£25,008,111	12.0	£225,887	£-
30	£-	£-	0	0	0	1	13	17.7	7.2	£26,178,595	12.0	£225,887	£-

Scenario		Do Something											
Year	Budget	Expenditure	Number of Structures in the…					$SSCI_{av}$	$SSCI_{crit}$	Shortfall	No. of Structures at Risk	Traffic Delay Cost	Upgrades, Improvements & Lifecycle Plans (Capital)
			'Very Good' condition band	'Good' condition band	'Fair' condition band	'Poor' condition band	'Very Poor' condition band						
0			0	1	6	7	0	68.3	44.5	£-	0.0	£-	
1	£-	£5,545,000	7	7	0	0	0	90.5	81.0	£-	0.0	£-	£5,545,000
2	£-	£-	7	7	0	0	0	90.3	81.0	£-	0.0	£-	£-
3	£-	£-	6	8	0	0	0	90.1	81.0	£-	0.0	£-	£-
4	£-	£-	6	8	0	0	0	89.8	81.0	£-	0.0	£-	£-
5	£-	£-	5	8	1	0	0	89.1	80.5	£-	0.0	£-	£-
6	£-	£-	3	9	2	0	0	88.0	80.5	£66,787	0.0	£-	£-
7	£-	£-	3	9	2	0	0	87.0	79.6	£66,787	0.0	£-	£-
8	£-	£-	2	9	3	0	0	84.8	79.5	£66,787	0.0	£-	£-
9	£-	£-	2	8	4	0	0	83.2	79.1	£223,559	0.0	£-	£-
10	£-	£-	2	6	6	0	0	81.9	78.0	£347,630	0.0	£-	£-
11	£-	£-	2	6	5	1	0	80.8	77.9	£347,630	0.0	£-	£-
12	£-	£-	2	5	6	1	0	79.3	76.7	£347,630	0.0	£-	£-
13	£-	£-	1	5	6	2	0	77.9	76.5	£347,630	0.0	£-	£-
14	£-	£-	1	5	5	3	0	75.3	75.1	£490,934	0.0	£-	£-
15	£-	£-	0	6	4	4	0	73.1	71.1	£785,339	1.0	£10,897	£-
16	£-	£-	0	5	5	4	0	71.7	71.0	£1,399,711	1.0	£10,897	£-
17	£-	£-	0	3	7	4	0	69.2	67.0	£1,399,711	1.0	£10,897	£-
18	£-	£-	0	3	6	5	0	67.4	63.4	£1,686,284	1.0	£10,897	£-
19	£-	£-	0	3	6	4	1	65.5	62.4	£2,994,822	1.0	£10,897	£-
20	£-	£-	0	3	4	5	2	63.4	57.5	£3,755,522	1.0	£10,897	£-
21	£-	£-	0	2	5	5	2	61.2	55.5	£3,759,450	2.0	£25,426	£-
22	£-	£-	0	2	5	4	3	59.9	54.2	£3,905,974	2.0	£25,426	£-
23	£-	£-	0	2	5	4	3	57.2	51.8	£4,008,137	3.0	£30,138	£-
24	£-	£-	0	2	4	4	4	54.9	48.2	£4,234,309	4.0	£33,770	£-
25	£-	£-	0	2	4	4	4	53.1	47.5	£4,444,799	4.0	£33,770	£-
26	£-	£-	0	0	3	7	4	49.1	43.3	£5,236,823	4.0	£33,770	£-
27	£-	£-	0	0	2	8	4	48.1	39.5	£5,617,151	5.0	£62,828	£-
28	£-	£-	0	0	2	7	5	45.8	36.3	£6,570,562	6.0	£70,093	£-
29	£-	£-	0	0	2	5	7	43.5	34.2	£6,948,871	7.0	£82,069	£-
30	£-	£-	0	0	2	5	7	41.3	33.3	£8,742,144	7.0	£100,231	£-