



The infilling of Great Musgrave bridge

JUNE 2021



The HRE Group

Summary

Built in the early 1860s, Great Musgrave bridge is part of the Historical Railways Estate (HRE) of more than 3,100 disused structures managed by Highways England (HE) for its owner, the Department for Transport (DfT).

It was revealed in January 2021 that HE intends to infill 116 bridges and tunnels, and demolish as many as 18 bridges and abutments, over the next five years. Around one-third of these structures are proposed for reuse within new active travel routes, reopened railways and heritage line extensions, or they have the potential to play those roles in the medium term. Great Musgrave bridge is needed for a proposed link between the Eden Valley and Stainmore heritage railways in Cumbria.

HE's 2017 Detailed Examination report recorded the structure's condition as 'Fair'. The 2020 Visual Inspection report stated that the bridge presents no significant public safety risk and no action is required. It recommended the repointing of open joints in the arch - at a cost of £5K - which, according to a 1998 structural assessment, would have increased the bridge's capacity from 17 tonnes to 40 tonnes. The work was not undertaken.

In April 2020, HE's agent, Jacobs, notified Eden District Council (EDC) that Great Musgrave bridge was going to be infilled "to prevent further deterioration of the bridge from occurring and remove the associated risk of structural collapse and harm to the public". There is no evidence to suggest that HE considered any option other than infilling to address the perceived risks. EDC agreed that the work did not require planning permission and the scheme was carried out in May/June 2021 at a contracted cost of £124K.

Both HE and a government Minister have made clear that, before any infilling scheme is undertaken, stakeholders will be consulted and Highways England will work to retain access beneath any structure where a viable need to do so is identified. However, there was no dialogue with either the Eden Valley or Stainmore railways before Great Musgrave bridge was infilled and the absence of a planning application resulted in these two parties being unaware that the work was proposed. They would otherwise have objected.

HE and the DfT should commit to the submission of planning applications for all schemes - unless there is an urgent, serious and demonstrable risk to the public - to ensure no stakeholder is disenfranchised.

EDC twice asked Highways England to pause its works whilst the matter was investigated, but the company refused citing specific Permitted Development rights which only facilitate temporary works in emergency situations posing a serious threat of death or injury.

In response to subsequent media enquiries, Highways England made a number of exaggerated claims to justify the infilling, including the suggestion that the bridge was unsafe and its deck could "fall suddenly". However the available technical evidence contradicts all such statements.

In 2016, HE produced a Draft Strategic Plan for the HRE's future management which outlines the company's intention to "significantly reduce the level of liability and risk to the HE and DfT" through interventions such as infilling and demolition. It is likely that the Great Musgrave scheme was progressed in pursuit of this agenda and EDC's consent provided an opportunity to do so without public scrutiny.

Background

The Historical Railways Estate (HRE) is a collection of more than 3,100 disused bridges, viaducts and tunnels, owned by the Department for Transport (DfT) and managed on its behalf by Highways England (HE).

In the spring of 2016, a paper was prepared for Highways England's Board which reviewed the performance of the HRE over the previous six months and proposed a Draft Strategic Plan (DSP) for the Estate's future management. This Plan considered "how the current inspection based and reactive approach should be transformed to one that is more intervention based", the aim being to "significantly reduce the level of liability and risk to the HE and DfT" by demolishing 10-15% of the Estate and infilling other structures.

Using standard costings for each type of intervention, the estimated cost of delivering the DSP was put at £370-560M. It was asserted that "there is no realistic prospect of improving the overall condition of the HRE" between 2015 and 2020 as HE's budget for managing it during that period averaged £8.25M. However, in the summer of 2020, Highways England awarded framework contracts for HRE works to the value of £254M, covering the seven years to July 2027.

In a letter to Robbie Moore MP on 12 January 2021, the Minister of State for Transport, Chris Heaton-Harris MP, stated that "no decisions have yet been made as to the level of HRE funding" beyond 2021-22. It therefore remains unclear as to how Highways England felt able to award contracts to six companies involving average annual expenditure of £36.3M.



Three of the bridges earmarked for infilling: (left) a structure engineered by Isambard Kingdom Brunel near Saltash, Cornwall; (centre) a Grade-C listed structure near Montrose, Angus, which is needed for a heritage railway extension; (right) a structure at Alnwick, Northumberland, which spans the route of a proposed greenway.

In January 2021, several general media outlets and specialist railway/engineering publications reported that Highways England was intending to infill 116 disused structures and demolish up to 18 others as part of an asset management programme lasting five years. These numbers were based on a spreadsheet issued by HE in response to a Freedom of Information request.

The company's initial response was to assert that "Around 200 of the public road bridges managed by HE/HRE have failed their most recent structural assessment (BD21) but haven't had any restrictions implemented. Therefore, our planned infilling is the safest and most appropriate option and will maintain access across the structure."

Based on records sourced under the Freedom of Information Act, The HRE Group subsequently revealed that 55 of the bridges earmarked for infilling (48%) had *not* failed assessments, 24 (21%) were regarded by Highways England as being ‘fit for purpose’ and eight (7%) *did* have weight restrictions. The Group also evaluated the at-risk structures and found that around one-third were already proposed for reuse as part of new active travel routes, railway reopenings and heritage line extensions – or had the potential to play such roles in the future – and infilling could *not* therefore be regarded as the “most appropriate option” due to its wider negative impacts.

Highways England’s public position then changed, stating only that “We are acting to keep people safe from actual risks identified by experienced engineers who have had the benefit of inspecting the structures”. The company went on to say that “Infilling or demolition is only considered when structures have been assessed as unsafe”.

The HRE Group challenged these statements, arguing that the majority of the threatened structures remain in ‘Fair’ condition, show no signs of distress/overloading and cannot legitimately be regarded as “unsafe” by any reasonable definition of the word.

In May 2021, Highways England told *The Telegraph* that only 69 structures are now proposed for infilling, although the company subsequently refused requests to provide a list of them for verification purposes. This disenfranchises stakeholders who might want to make representations about a particular bridge or tunnel.

In response, The HRE Group questioned how the condition of 47 structures that Highways England had previously claimed were “unsafe” could have improved without any intervention.

Between December 2020 and February 2021, Highways England issued contracts for two demolitions and seven infilling schemes with average values of £125K for the demolitions and £191K for the infillings, although the latter figure is inflated by a single scheme of £439K in Scotland. The average otherwise is £149K.

Three of these schemes benefit from pre-existing planning permission; the remainder are being progressed after the relevant Local Planning Authority determined that the works constitute “repair” or Permitted Development, despite significant ecological, environmental, economic and sustainable transport impacts which would not therefore be scrutinised. This suggests that the programme is being driven by opportunism, rather than risk or condition concerns.

It should be noted that most Local Planning Authorities have made clear to Highways England that infilling and demolition schemes require planning permission.

Great Musgrave bridge

Opened in 1862, the Eden Valley Railway ran from Clifton Junction near Penrith, Cumbria, via Appleby to Kirkby Stephen where it made a junction with the South Durham & Lancashire Union Railway which had opened a year earlier. Both lines were engineered by the prolific Cumbrian-born civil engineer Thomas Bouch.

Just to the north of Musgrave Station, the line passed beneath a single-span masonry bridge (structure number EDE/25) which carries the B6259. This road extends for about six miles between junctions with the A66 trans-Pennine route at Sandford and the A685 north of Kirkby Stephen.

The section of line between Warcop and Merrygill Quarry (east of Kirkby Stephen) closed in 1975, marking the end of the bridge's role as an operational railway structure.



Musgrave Station, with the B6259 overbridge in the distance. CUMBRIAN RAILWAYS ASSOCIATION

In 1995, plans were formulated to restore the line as a tourist attraction between Appleby and Kirkby Stephen East Station. This aspiration was included in the 2008 Upper Eden Community Plan. Two groups of volunteers - the Eden Valley Railway Company (EVR) based at Warcop and the Stainmore Railway Company (SRC) at Kirkby Stephen East Station - have reopened two sections totalling 3.5 miles, built relationships with local landowners and developed plans for the full route, including the reinstatement of a bridge over the River Eden which was dismantled in 1985.

On 18 October 2019, representatives from the Stainmore Railway Company met a Highways England engineer to discuss the proposed infilling of a three-span bridge (EDE/9) which crosses the line near Waitby, about one mile north-west of Kirkby Stephen East Station.

A written record of the meeting, agreed by all parties, states that:

“The HRE will require planning permission from the YDNPA [Yorkshire Dales National Park Authority] before work can commence. The best way to protect the bridge will be for it to be recognised as a heritage asset in the Eden Local Plan. There is a precedent for this with the planning application for a starter home at Waitby Crossing being refused in October, 2018. One of the reasons given was as follows: ‘The proposed development has not been supported by an assessment of the significance of the former Eden Valley Railway line. The dwelling would be an obstacle to its restoration preventing a sustainable rural tourism and leisure initiative from being fulfilled’.”

The cost of infilling EDE/9 was estimated at £200,000. As an alternative, Highways England’s engineer indicated that the Stainmore Railway Company could fund repairs to the bridge - likely to cost around £40,000 - but one complicating factor would be:

“...the crucial role played by [REDACTED] who is the Head of Estates at the DfT. [He] has the right to veto any proposal and prevent trains passing under bridge EDE/9.”

At no point was the bridge at Great Musgrave (EDE/25) discussed.



Great Musgrave bridge carries the B6259 over the trackbed of the former Eden Valley Railway between Warcop and Kirkby Stephen.

On 23 April 2020, Highways England's agent for works on the Historical Railways Estate, Jacobs, wrote to Eden District Council to inform the planning team of infilling works proposed for the bridge at Great Musgrave. The letter stated that:

"A BD21 assessment undertaken in 1998 found the structure suitable only for 17 tonne GVW."

"To prevent further deterioration of the bridge from occurring and remove the associated risk of structural collapse and harm to the public, it is proposed to infill the bridge to ensure the long-term stability of the bridge and road."

"The bridge is in poor condition with a reduced load carrying capacity, infilling the structure is considered necessary to prevent further deterioration and remove the risk of future collapse."

The works were described as involving:

"...structural fill comprising of a layer of 6C free draining material with HDPE pipes laid on top at current ground levels to aid surface water through flow. The remaining fill beneath the span will comprise 6N granular structural fill and foamed concrete. New embankments will be formed from 6N material and tied into the existing ones."

On 24 April 2020, a Planning Technician from Eden District Council wrote back to Jacobs stating that:

"I have a [sic] checked with a colleague who is of the opinion that the works described in the email attachment would constitute permitted works to maintain the highway. You may also wish to check with the Highway Authority that they have no issues with the proposal however we don't consider that we would need to see a planning application for these works."

On 10 March 2021, contractor AmcoGiffen was awarded a contract for the infilling of Great Musgrave bridge at a cost of £123,580.64. By chance, a director of the Stainmore Railway Company noticed the works underway on 24 May and infilling was completed in June.

Neither the EVR or SRC had been informed of the impending works or consulted about their impact on the railways' future operations.

Technical evidence

The BD21 structural assessment cited by Jacobs as part-justification for infilling the bridge was undertaken by Cumbria County Council - Construction Services for the British Rail Property Board in November 1998.

CUMBRIA.CC

CUMBRIA COUNTY COUNCIL - CONSTRUCTION SERVICES BD 21/97 LOAD ASSESSMENT REPORT FOR: B6259 GREAT MUSGRAVE RAILWAY BRIDGE	PAGE No. 2 OF 38 PAGES REV No. 0 DATE: No. 98
--	--

The assessment was carried out in accordance with the standards stated in the Design Basis Statement/Approval in Principle Form TA1 countersigned by the Client on10 Nov 97.....(delete if non-applicable).

1. The results of the assessment are as follows:

Great Musgrave No 25 Railway Bridge has been assessed in accordance with BA16/97 and BD21/97 using the modified MEXE method.

The arch barrel has been found to be unsatisfactory for Full Construction and Use loading. A 17 Tonne weight restriction should be applied to the structure.

The allowable axle loads are: Max single axle load = 11.5T per axle
 Max double axle load = 7.5T per axle
 Max triple axle load = 6.5T per axle

The foundations, abutments, wingwalls, spandrels and parapets have been assessed qualitatively (visual inspection) in accordance with clause 8 of BD21/97 and are considered adequate to carry the present imposed loading.

The parapets do not comply with the requirements of BD52/93 in terms of impact resistance.

2. Recommendations to increase the assessed capacity are as follows:

Repoint arch barrel

It states that a 17-tonne weight restriction should be applied to the bridge and the arch barrel repointed to increase its capacity. Defects in the arch ring (local spalled elements and open joints) are classified as B2 ("Slight, not more than 5% of...area affected" and "Minor defects of a non-urgent nature").

CUMBRIA.CC

15	JACK ARCHES			
16	ARCH RING/ARMGØ	B	2	REPAIR LOCAL SPALLED ELEMENTS; REPOINT OPEN JOINTS
17	SPANDRELS	D	3	REPOINT OPEN/CRACKED JOINTS; MONITOR NORTH SPANDRELS FOR FURTHER MOVEMENT
18	TIE RODS			

The report noted that:

- ▶ “Inspection of the bridge did not reveal any undue signs of movement/settlement which would indicate any inadequacies in the foundations.”
- ▶ “Inspection of the abutments did not reveal any defects which would reduce their ability to carry the current imposed loading.”
- ▶ Spalling was identified on four stone blocks within the arch barrel, together with “leachate deposits” and “random open joints were evident to 10% of the barrel soffit in the crown area”.
- ▶ “The length of open joints varied between 150 to 300mm to an average depth of 300mm.”
- ▶ “The alignment of the south spandrel was satisfactory with no sign of any significant lateral displacement, bulging or movement.”
- ▶ “The alignment of the [north] spandrel wall was satisfactory with no significant bulging or deformation evident.”
- ▶ No significant defects were recorded to the wing walls or parapets.
- ▶ “The bitmac surfacing over the structure was found to be in a satisfactory condition, however very minor rutting was evident to the surfacing. Inspection of the surfacing did not reveal any significant settlements/ rutting, therefore the unknown barrel fill is assumed to be well compacted.”

	Cumbria County Council		Construction Services	Sheet No. 25 of 38 Sheets Rev. No. 0
	Consultancy & Design Work Sheet			
	Scheme	Scheme Ref.	Date Prepared	
Element / Item	Joblog No.	Date Checked		
Code Ref.	CALCULATIONS / WORK			Output / Remarks
	<p style="text-align: center;"><u>STRENGTHENING OPTIONS</u></p> <p><u>OPTION 1</u></p> <p style="background-color: #f0f0f0; padding: 2px;">REPOINT OPEN JOINTS</p> <p>$\therefore f_m = 1.0, f_d = 1.0$</p> <p>M.A.L = 10.355 TONNES</p> <p>\therefore SINGLE AXLE = 16 TONNES DOUBLE AXLE = 10.5 TONNES TRIPLE AXLE = 9.5 TONNES</p> <p style="background-color: #f0f0f0; padding: 2px;">\therefore SATISFACTORY FOR FULL 40 TONNE ASSESSMENT LOADING</p>			

Only one option was recommended for strengthening the bridge: repointing the open joints which would be “satisfactory for full 40 tonne assessment loading”.

The bridge at Great Musgrave has never had a weight restriction imposed. The road it carries, the B6259, is sufficiently wide for two cars to pass carefully along most of its length, but is narrower in places, incorporates several sharp bends and three humped crossings of the River Eden. It is not passable by vehicles over 12 feet 3 inches (3.73 metres) in height due to a railway bridge near Sandford, although an alternative route from Warcop to the A66 is spanned by a bridge with a higher clearance of 13 feet 4 inches (4.06 metres).

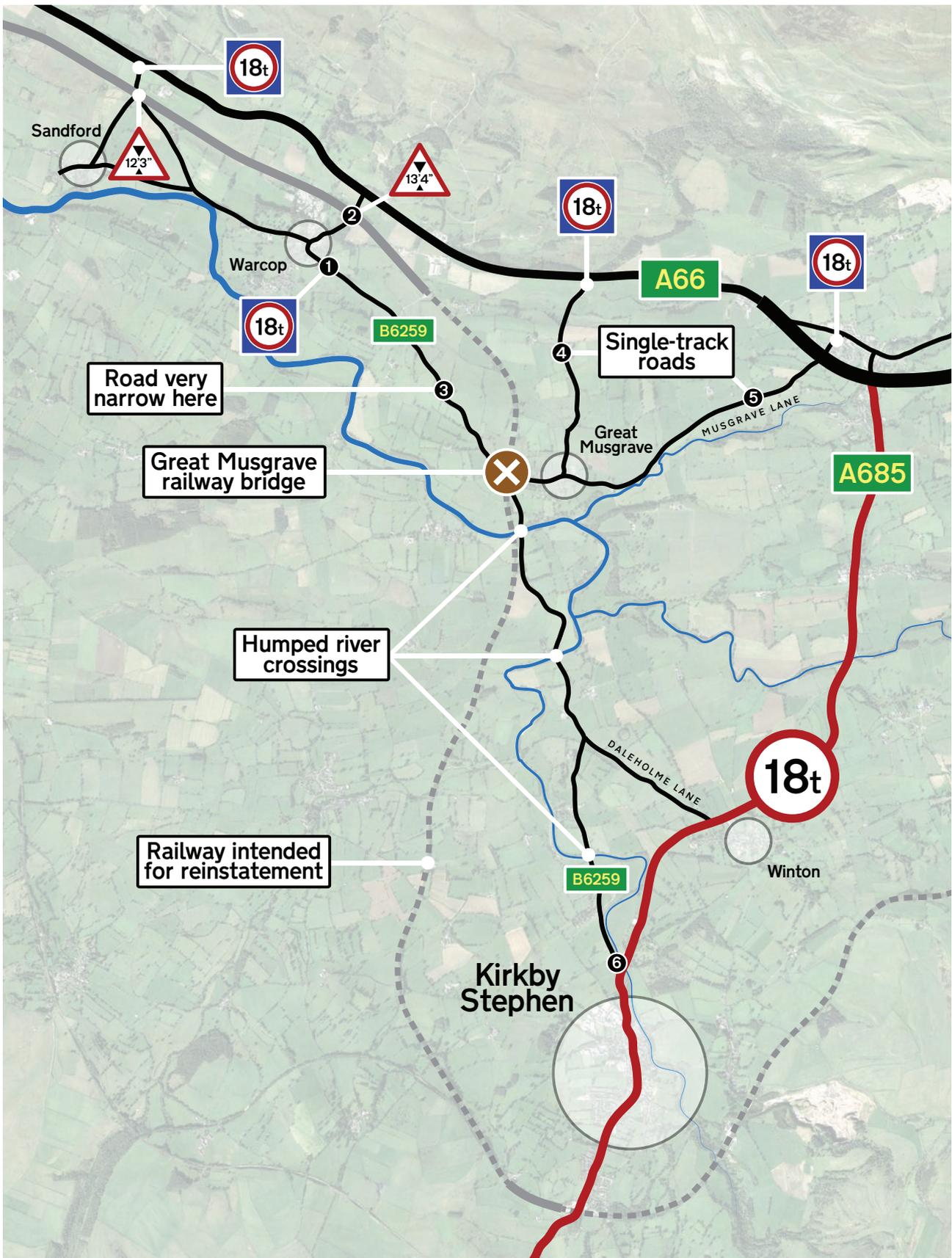
As a result of these constraints and the sparse local population, the B6259 sees very little traffic. Anecdotal evidence suggests the bridge is typically crossed by one vehicle every five minutes during the day - mostly cars, but some small vans and 4x4/SUVs used by farm workers.



Great Musgrave bridge is only wide enough for a single vehicle and the main road turns at right angles at its east end.

The A685 runs in a north-south direction to the east and south of Great Musgrave and connects the A66 at Brough to the M6 at Tebay. To the north of Kirkby Stephen, the road is subject to an 18-tonne weight limit which prohibits HGVs entering the town except for access, permit holders and vehicles carrying livestock.

The B6259 forms a junction with the A685 immediately to the north of Kirkby Stephen and the very narrow Daleholme Lane diverges from the B6259 to meet the A685 at Winton. Signposts convey the weight restriction for drivers exiting the B6259/Daleholme Lane onto the A685, and advanced warning of the restriction is provided on all approaches to Great Musgrave bridge. As a result, it is not permissible for vehicles over 18 tonnes to make through journeys via the bridge, except for the categories stated above.



A map showing the local road network (black) around Great Musgrave bridge (brown circle) and the A685 weight restriction (red) which is signposted (blue squares) on all approaches to the bridge, prohibiting vehicles over 18 tonnes making through journeys to/from the A685. Traffic size is further constrained by two low railway bridges near Warcop and Sandford, three humped crossings of the River Eden, sharp bends and the narrow nature of the lanes entering Great Musgrave village from the north and east.

1



Leaving Warcop towards Great Musgrave bridge, signs alert drivers to a narrow bridge ahead (followed immediately by a sharp bend) and the 18-tonne weight restriction on the A685 around Kirkby Stephen.

2



The higher of two railway bridges which restrict the size of vehicles approaching Great Musgrave bridge from the west.

3



A narrow section of the B6259, 1300m west of Great Musgrave bridge.

4



A narrow unnamed lane connecting the A66 to Great Musgrave, unsuitable for larger vehicles. GOOGLE STREETVIEW

5



The narrow Musgrave Lane connecting Brough to Great Musgrave, unsuitable for larger vehicles. GOOGLE STREETVIEW

6



A weight restriction prohibits vehicles of more than 18 tonnes exiting the B6259 onto the A685. GOOGLE STREETVIEW

The most recent Detailed (tactile) Examination of Great Musgrave bridge was carried out by Carillion on 29 August 2017. It recorded the structure as being in ‘Fair’ condition which is the highest rating that can reasonably be expected of what was then a 155-year-old bridge.

In respect of the arch and ring face, the report records:

- ▶ “Slight deflection in stonework sagging up to 4mm at worst in places to the crown region.”
- ▶ “Slight or moderate friable erosion with loss of face to the stonework” in a number of areas.
- ▶ Some localised drumminess.
- ▶ Areas of degraded mortar joints up to 15mm wide and 40mm deep (average 25mm deep) at worst.
- ▶ Evidence of water ingress below the verge areas, with discolouration, water staining and calcite/leachate deposits to the stonework, possibly indicating a failure of the waterproofing.
- ▶ “Fissure-type fractured stonework up to 1mm at worst in very isolated places.”

In respect of the south spandrel, the report records:

- ▶ “Bulging/oversailing to the stonework up to 8mm at worst in places causing fractured mortar joints up to 2mm in very isolated locations.”
- ▶ “Slight erosion to the stonework in places with some loss of face in various locations.”

Similar but minor defects are recorded to the abutments and wing walls.

To the north parapet, one area of vehicle impact scrape marks were recorded (up to 15mm deep at worst) and a second area of impact damage, with the stonework displaced by up to 100mm.

To the south parapet, one area of vehicle impact scrape marks were recorded (up to 6mm deep at worst) and two areas of possible impact damage, with the stonework displaced by 20mm at worst.

The examining engineer recommended investigation of the bridge’s waterproofing/drainage, the removal of adjacent trees (£2K - Priority 1: Action within the next 12 months or sooner) and general stonework repairs (£3K - Priority 2: Action within the next 5 years). It is not known whether any of these recommendations were subsequently implemented.

PUBLIC SECTOR INFORMATION
 LICENSED UNDER THE OPEN
 GOVERNMENT LICENCE V3.0

Historical Railways Estate

scoring matrix

Structure Reference EDE/25

Public Risk

Severity	No significant risk	0
Likelihood	Low	1

Highways England’s engineer recorded Great Musgrave bridge as presenting ‘No significant [public] risk’ and a low likelihood of any event occurring. No action was required.

The most recent Visual Inspection of Great Musgrave bridge was carried out by Balfour Beatty Rail on 8 February 2020.

PUBLIC SECTOR INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE V3.0



Bridge and Structures Examinations
Northern Area Bridge Examinations
Visual Examination Report



ELR: EDE	Structure No: 25	Mileage:	Examination date: 08/02/20
Route: Eden Valley Jn - Kirkby Stephen (Warcop Branch)		OS ref: NY 765 136	
Name: Great Musgrave		Type: Over bridge	

General view of structure: North Elevation	Examiner comments
	NEW DEFECTS
	New impact damage is noted at the east quoin of the south parapet since the previous detailed and visual examinations.
	LONG-STANDING DEFECTS
	Unless noted, all accessible long-standing defects show no evidence of change since the previous detailed examination dated 29/08/17 and the visual examination dated 31/07/18.
	Any changes within the structure have been highlighted with Red text.
	See page 2 for details.

A **Visual Examination** of this structure has been carried out and any deterioration in condition or development of defects or other factors, which might place at risk the public at large, is recorded in the Examiner's Comments section of this document.

Examiner: [Redacted]	Signed: [Redacted]
Date: 11/02/2020	

Access Hazards:

Moderately steep embankment down to the structure may result in potential slip, trip and fall hazards. The examiner was approached by the local landowner (his residential property is located to the southwest of the structure) who gave verbal permission allowing access at time of future examinations without the need to contact him. Kirkby Stephen West Junction with DNT has been denoted as the low mileage end (South).

Recommendations:

- Rebuild SE parapet quoin within six months- P1 £2.5k.
- Rpoint very deep open joints to soffit - P1 £5k.

In respect of the arch, the report records:

- ▶ Longstanding downward alignment defects along the transverse joint lines of individual stones at the crown and the east upper haunch. The downward alignment along the stonework was noted at up to 15mm where accessible, compared with up to 4mm at time of the Detailed Examination.
- ▶ A number of joints showed mortar loss up to 170mm, compared with up to a maximum of 40mm at time of the Detailed Examination.

All other longstanding defects showed no evidence of change since the 2017 Detailed Examination and previous Visual Inspection on 31 July 2018.

Impact damage was recorded to the south parapet over a length of 2.4m, with inward displacement along the second course of up to 12mm over a length of 1.36m; the copings were displaced by up to 22mm. A local person informed the inspector that the parapet had been struck by a farm vehicle in the spring of 2019.

The inspector recommended repair of the parapet damage within six months (£2.5K) and repointing of the deep open joints to the arch soffit (£5K - Priority 1: Action within the next 12 months or sooner). These recommendations were not implemented.

PUBLIC SECTOR INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE V3.0

Historical Railways Estate		scoring matrix
Structure Reference	EDE/25	
Public Risk		
Severity	No significant risk	0
Likelihood	Low	1
Action/Notes		Total
No action required.		1

Again, Highways England’s engineer recorded Great Musgrave bridge as presenting ‘No significant [public] risk’ and a low likelihood of any event occurring. No action was required.

Council response

Highways England authorised nine projects on Historical Railways Estate structures between December 2020 and February 2021. Three of the schemes had longstanding planning permission; the remaining six were consented to by the relevant Local Planning Authority without the need for planning permission. One of these was the infilling of Great Musgrave bridge.

When stakeholders discovered that infilling work was underway, there was immediate dialogue with high-level officers within Eden District Council who issued a briefing note to Members on 3 June 2021. It stated that:

“The initial assessment undertaken by the Planning Service considered that the stated works fell within the scope of the Permitted Development Rights. Therefore, such works did not require the prior grant of planning permission, which was confirmed to Highways England by the Planning Service on the 24 April 2020.

“Following recent notification from various Council Members and members of the public that Highways England have begun undertaking the works to infill the bridge at Great Musgrave, this position is currently being re-assessed by the Planning Service. Subsequently contact has been made with Highways England directly. The purpose of this contact is to open dialogue to ascertain the full extent, nature and reasoning for the works at Great Musgrave Bridge. This is presently an ongoing matter and as such discussions have not yet concluded.

“However, in recent correspondence Highways England have provided the following comments:

“The bridge failed a structural assessment in 1998 and the local highway authority refuses to apply a weight restriction. The works that we have planned remove the risk of failure of this bridge and are reversible. We consider the works to be permitted development as they will prevent a future collapse and preserve public safety (under class Q).”

“Class Q” refers to Schedule 2 Part 19 Class Q of The Town and Country Planning (General Permitted Development) (England) Order 2015. These powers are intended to facilitate works for the purposes of:

- ▶ preventing an emergency
- ▶ reducing, controlling or mitigating the effects of an emergency, or
- ▶ taking other action in connection with an emergency.

An emergency is defined as an event or situation which threatens serious damage to:

- ▶ human welfare in a place in the United Kingdom,
- ▶ the environment of a place in the United Kingdom, or
- ▶ the security of the United Kingdom.

Under these powers, the developer must, “as soon as practicable after commencing development, notify the local planning authority of that development”, but Highways England did not do so as it had not previously invoked Permitted Development rights for this scheme.

Furthermore, “on or before the expiry of the period of 6 months beginning with the date on which the development began...the [bridge] [must be] restored to its condition before the development took place, or to such other state as may be agreed in writing between the local planning authority and the developer.”

In other words, Class Q is intended to facilitate *temporary* works in an emergency situation, whereas infilling is intended to be permanent. Highways England provided no evidence to suggest an emergency was developing.

In April and September 2020, Highways England’s agent, Jacobs, wrote to 19 Local Planning Authorities (LPA) to inform them that 34 bridges in their area would be infilled under Permitted Development (Class Q). Two LPAs consented, three were non-committal, six did not respond to the letters, one pointed out that the infill would have to be removed within six months, whilst seven stated that PD was inappropriate and planning permission must be obtained.

Eden District Council’s briefing note concluded by stating:

“The Planning Services is presently verifying the responses provided by Highways England. Once sufficient information has been obtained from Highways England and verified, the Planning Service will be able to form a judgement and re-assess whether or not these works do constitute Permitted Development or require the prior grant of planning permission. This decision will dictate what, if any, action can be taken in relation to these works.”

During a conversation with The HRE Group, a member of the Council’s planning team stated that Highways England had twice been asked to stop the infilling works whilst investigations took place, but refused.

The infilling of two bridges in Dumfries & Galloway are currently being prepared, with contractors having met with landowners at both sites to agree arrangements. Dumfries & Galloway Council consented to these schemes without the need for planning permission.

Rather than structures being chosen on the basis of risk level or condition, the evidence suggests that Highways England’s programme is being driven by opportunism, targeting those structures that can be infilled without stakeholder engagement or exposure to public scrutiny through normal planning processes.

It is reasonable to believe that if Eden District Council had told Highways England that planning permission was needed, Great Musgrave bridge would not now be infilled.

Highways England statements

In the days after infilling started, the press and social media highlighted the activities of Highways England at Great Musgrave bridge. Anger was expressed at the negative ecological, environmental, economic, heritage and transport impacts of the work.

The company responded by issuing a number of public statements, some of which are set out and analysed below. It is recognised that these statements will most likely have been prepared by managers and/or press officers, and might therefore not fully reflect the views of the engineers involved. It is however clear that condition reports have been reviewed and some of the comments suggest a level of engineering input.

“Infills, some of which are only partial and retain pedestrian routes, aren’t permanent and are built in a way that allows for them to be reversed should organisations become interested in the structures’ future use.”

(Rail Engineer, 7 June 2021)

The infilling of Great Musgrave bridge is *intended* to be permanent. The works are *not* designed to facilitate removal and Highways England did not action a belated request from the Eden Valley Railway’s Civil Engineering Director to fit plastic sheeting to the arch which would have prevented damage to the bridge’s stonework arising from the foamed concrete infill bonding with it. Such sheeting would have been part of the initial design if the scheme had been developed with removal in mind.

Excavating the infilling would be a costly and challenging task, weakening the business case of any repurposing proposal. In this context, infilling is clearly undesirable. It also creates hidden critical elements within the bridge which can no longer be inspected or maintained. Deterioration or failure of these elements after infilling would increase the risks associated with removal.

“We can confirm that any work carried out by the Historical Railways Estate in the future will not thwart any potential active travel schemes, or any rail reopenings, including the extension of preserved railways. We have paused infilling and demolition works where local authorities have raised queries about the works.”

(David Wheatley, Highways England’s head of scheme delivery for the HRE: Rail Engineer, 7 June 2021)

This statement demonstrably conflicts with the prevailing circumstances at Great Musgrave. Highways England has physically thwarted the extension of the Eden Valley and Stainmore railways, and could have made it financially unsustainable.

Eden District Council twice asked Highways England to pause its works at Great Musgrave whilst uncertainties over their planning status were resolved. HE refused to do so.

“We have complied with any planning requirements and have consulted widely – including with Eden Valley District Council, Sustrans and the Eden Valley Railway Company – on our plans to strengthen the bridge with an infilling scheme which we aim to complete this financial year.”

(David Wheatley, Highways England’s head of scheme delivery for the HRE: Highways, 9 June 2021)

This statement is untrue. No officers from either the Eden Valley or Stainmore railways were consulted about the infilling of the bridge. This represents a serious and damaging oversight as EVR/SRC are the only stakeholders with a known and longstanding interest in the future of Great Musgrave bridge.

“For safety reasons there is an urgent need to strengthen this bridge. The bridge parapets have been struck and scraped many times by vehicles unsuitable to use it. There’s currently no suitable weight restriction in place for the bridge, meaning drivers of large or heavy vehicles could use the bridge without knowledge of its weakness.

“We will always work with local groups to ensure our work does not impact on future planned projects. Infilling this structure means that it can be reopened if plans for a rail line develop further, and by carrying out this work the route can remain safe for the drivers who need to use this bridge.”

(Richard Marshall, Highways England’s director of the HRE: Highways, 9 June 2021)

The definition of a ‘substandard structure’ set out in Highways England Standard CS454 *Assessment of highway bridges and structures* specifically notes that the term “does not apply to structures with sub-standard non-primary load carrying elements that are not directly affected by carriageway loading (such as sub-standard parapets, and bridge supports at risk from collision).”

The existing damage to the bridge’s south parapet is reported to have occurred in spring 2019 and was attributed to a local farmer; however there is no evidence that the vehicle involved was “unsuitable to use it”. A typical tractor weighs three tonnes - 14 tonnes below the assessed capacity of the bridge. But the damage could equally have been caused by a novice or careless car/van driver, or a vehicle towing a caravan.

Highways England has only asserted that the bridge is *under strength* and requires a weight restriction; it has not suggested any need for a width or height restriction.

Impact damage to parapets is a familiar issue to the owner of any road bridge and is routinely managed. It is indicative only of humanity’s propensity for errors of judgement and lapses in concentration; it does not provide meaningful evidence regarding vehicle size or weight.

Infilling will have no effect on the occurrence of damage to the parapets of Great Musgrave bridge.

Highways England did *not* work with any ‘local groups’ to prevent impact on the future reconnection of the EVR/SRC which has been actively in planning for more than 20 years. The infilling of Great Musgrave bridge means that plans to develop the railway are less likely to come to fruition due to the cost and engineering difficulties associated with removal of the infill.

The implication that infilling is a positive act in relation to the railways’ plans is risible given the availability of much cheaper alternatives that would have retained access beneath the bridge.

“Infilling or demolition is only considered when structures have been assessed as unsafe. We don’t demolish or infill a structure without first determining if there’s a viable interest, from a local authority or another organisation.”

(Bullet points issued to BBC Radio Cumbria: Highways, 22 June 2021)

In December 2020, *The Times* and *New Civil Engineer* magazine reported that around 4,000 of the 9,000 bridges on the UK’s strategic road network - which is managed by Highways England - have “sections which are in a ‘poor’ or ‘very poor’ condition”. In response, Highways England Chief Highways Engineer, Mike Wilson, said: “All our structures are safe and regularly inspected. A rating of ‘poor’ or ‘very poor’ does not mean that a structure is unsafe.”

Mr Wilson’s statement is equally applicable to structures within the Historical Railways Estate. Whilst the bridge had an assessed capacity of only 17 tonnes, there is no evidence to suggest it was “unsafe” based on its recorded condition and the type/volume of traffic using it.

Highways England failed to determine that the Eden Valley and Stainmore railways had a viable and longstanding interest in Great Musgrave bridge which should have been self-evident if basic research had been undertaken. As a consequence, their intention of reuniting to create an attraction that would draw tourists into the area has been severely compromised.

“The condition of the bridge has deteriorated over time. We last repointed the arch in 2012, however, in 2020 we identified mortar loss up to 170mm in the bridge arch (previous assessments showed a loss of 40mm) and increasing downward movement of the masonry forming the arch. The support provided by infilling the arch will mean a weight limit is no longer required and the bridge will remain safe for everyone who wishes to use it.”

(Bullet points issued to BBC Radio Cumbria: Highways, 22 June 2021)

By definition, the condition of every bridge deteriorates over time, hence the requirement for an effective inspection and maintenance regime.

The 1998 assessment recorded some mortar loss of full arch barrel depth (i.e. 450 mm at the crown) and average depth of 300mm. Despite this, no concerns were raised about the condition of the structure and the only recommendation was to repoint it, restoring full 40-tonne capacity.

Downward deflection of individual masonry blocks is partly a function of the open joints. The 2020 inspection recorded localised deflection of 15mm against 4mm at the time of the 2017 examination. This would be regarded as modest and of no particular concern, but 11mm deflection in three years is indicative of the need to programme the repointing, as recommended by the inspector.

“The need to start work on the bridge was urgent. The structure was weak, potentially causing the bridge deck to fall suddenly.”

(Bullet points issued to BBC Radio Cumbria: Highways, 22 June 2021)

This statement suggests questionable competence or a willful attempt to mislead and scaremonger.

Arches have large reserves of strength, as has been demonstrated through laboratory and field testing. There would have been warning signs prior to any catastrophic failure, such as lateral movement of the spandrel walls. No such signs were recorded during the February 2020 inspection and no concerns were raised about the condition of the structure, hence Highways England’s engineer recorded it as presenting “No significant [public] risk” and with a low likelihood of any event occurring.

For context, this pair of photographs shows destructive testing of a bridge to determine the extent to which a masonry arch can be overloaded before it completely fails. In the left-hand image, it is capable of carrying around 100 tonnes whilst, in the right-hand image, it could still carry road traffic.



The photograph below shows an arch with two masonry blocks deflected by around 70mm and visibly moving. This bridge was still carrying 1,400x 22.5-tonne axles on a daily basis.



“If the land ownership and river crossing issues get resolved to move forward with re-opening the line, then we would be delighted to work with any rail groups and the local authority to remove the infill at no cost to them and at a fraction of the cost of providing a new river crossing.”

(Bullet points issued to BBC Radio Cumbria: Highways, 22 June 2021)

This statement commits the taxpayer to further significant expenditure on Great Musgrave bridge - amounting to tens of thousands of pounds - in the event of the railways' reconnection plan progressing. However it is not clear how the Eden Valley and Stainmore railways would invoke and, if necessary, enforce this commitment at the appropriate time when the managers who made it could have moved on to other roles.

The suggestion that removal of the infill would cost a fraction of reinstating the nearby missing bridge over the River Eden reflects the prevailing culture in a statutory body with a multi-billion pound budget, where there is no incentive to seek pragmatic, value-for-money solutions. The determination and ambition that characterises the volunteers who drive the heritage railway sector have helped to overcome many such barriers, including the excavation of Imberhorne cutting on the Bluebell Railway in West Sussex and the ongoing work to unify the two legs of the Leicestershire's Great Central Railway at Loughborough.

There is no evidence to suggest that Highways England has any meaningful insight into the cost of reinstating the river bridge if undertaken by motivated people with a can-do mindset using spans salvaged from elsewhere.

“When work to make the bridge safe was substantially complete, the local authority contacted us asking for it to be paused for them to conduct more thorough analysis on whether the work should be progressed under permitted development.”

(Bullet points issued to BBC Radio Cumbria: Highways, 22 June 2021)

This is untrue. When Eden District Council first asked for the work to be paused, placement of the granular fill had only just started.

“Strengthening leaves an ongoing maintenance liability which then further increases cost to the public purse. We last repointed the arch in 2012. Infilling is maintenance free...”

(Bullet points issued to BBC Radio Cumbria: Highways, 22 June 2021)

The contracted cost of infilling was £123,580.64. According to Highways England's 2016 Draft Strategic Span, a typical bridge incurs £25K of inspection, maintenance and assessment costs every ten years. It would therefore take 49 years for the public purse to benefit from the Great Musgrave infill scheme.

However, this does not take into account the lost tax revenue from the economic boost brought by tourists who would have visited the Eden Valley to ride on the extended heritage line if it had not been obstructed.

“Railway Paths Limited own most of the closed branch line and informed us that the Eden Valley Railway Company and Stainmore Railway Company Ltd did not wish to acquire the land due to there being no river crossing in place.”

(Bullet points issued to BBC Radio Cumbria: Highways, 22 June 2021)

This is untrue. Railway Paths Ltd only owns the trackbed between Appleby and Warcop - ending more than a mile north of Great Musgrave bridge - and a short section north of the missing river crossing. The Eden Valley Railway Company sought the transfer of this latter section into its ownership, but the Department for Transport would not allow it due to the inclusion of two underbridges.

The Stainmore Railway Company has never been approached by Railway Paths with a view to acquiring any part of the railway trackbed.

“As you would expect, prior to any work taking place Highways England spoke to stakeholders including Sustrans, Railway Paths Limited and the Railway Heritage Trust. We received no objections.”

(Bullet points issued to BBC Radio Cumbria: Highways, 22 June 2021)

In a letter sent to the House of Commons Transport Committee on 16 April 2021, Transport Minister Baroness Vere stated that “where there is an interest to retain access [under a bridge], HE will work to retain this access. Its engagement with local authorities and other stakeholders is part of uncovering that interest where it exists.”

The only two parties with a known and longstanding interest in access under Great Musgrave bridge were the Eden Valley and Stainmore railways. Neither Sustrans nor the Railway Heritage Trust have relevant interests.

On 3 June, Highways England claimed to have “consulted widely - including with...the Eden Valley Railway Company - on our plans to strengthen the bridge with an infilling scheme”. This was untrue. There has been no dialogue with either the Eden Valley or Stainmore railway about the scheme. If there had been, both railways would have vigorously objected to it as it is demonstrably against their interests.

Conclusion

The 2020 visual inspection of Great Musgrave bridge identified no issues of concern or signs of distress, with only minor defects that had mostly remained unchanged since the time of the 2017 detailed examination. Highways England's engineer had recorded the structure as presenting 'No significant risk' to public safety and a 'Low' likelihood of any event occurring, with 'No action required'.

The inspector recommended repointing the open joints in the arch barrel at an estimated cost of £5K, a conclusion supported by an 11mm deflection of individual masonry blocks over three years and the depth of mortar loss.

These defects are typical of those affecting structures of this type and age, and can be routinely managed. Great Musgrave bridge was in good condition compared with many similar highway structures.

The bridge was classified as being of 'Priority 2' - "Action [required] within the next 5 years". However Highways England has attempted to portray Great Musgrave bridge as presenting a serious and immediate threat to public safety, stating that its weakness could have resulted in the deck suddenly falling. This conflicts absolutely with the available technical evidence and is indicative of either a deliberate attempt to mislead and scaremonger in the face of criticism, or questionable competence.

The 1998 structural assessment, cited by Highways England as demonstrating the weakness of Great Musgrave bridge, specifically states that repointing would increase its capacity to 40 tonnes. There was no reassessment following repointing work in 2012.

The company is correct in stating that the recommended weight restriction had not been imposed, but the nature of the local road network and an 18-tonne limit at Kirkby Stephen severely restricts the size of vehicles able to use the bridge. The road crossing it is very lightly used and Highways England has provided no evidence of misuse by oversized/overweight vehicles. The structure shows no signs of overloading.

Highways England has implied that infilling was the only viable option for Great Musgrave bridge. Network Rail's inventory of Victorian railway structures will include many in a worse condition, but it cannot close the railway and infill its bridges. Demonstrably, there are proportionate and cost-effective alternatives that can be implemented instead.

There is no evidence to indicate that any of the provisions set out in Highways England Standard CS470 *Management of Sub-Standard Highway Structures* were applied. Infilling was always the direction of travel.

Highways England asserts that strengthening the bridge would have burdened the taxpayer with ongoing inspection and maintenance obligations, but its own figures indicate that no financial benefit from infilling will be accrued until 2070 and this disregards the loss of tourism revenue resulting from the obstruction of the planned heritage line. By stating that it would remove the infill if reconnection of the two railways went ahead, Highways England has committed the taxpayer to a further significant financial burden.

Any objective appraisal of the evidence can only lead to one conclusion: the infilling of Great Musgrave bridge was unjustified on engineering, public safety or financial grounds. There is no evidence to suggest that alternative strengthening/repair options were considered; there was also no appraisal of the heritage loss or wider environmental impact, although it is understood that an ecological study was carried out by Highways England's own agent, Jacobs.



Although Highways England consulted its partners in Sustrans, Railway Paths and the Railway Heritage Trust, there was no dialogue with the only two stakeholders with a known and longstanding interest in access beneath the bridge, contradicting the assurances given by Baroness Vere, Parliamentary Under Secretary of State at the Department for Transport, in her letter of 16 April 2021 to the House of Commons Transport Committee.

In the same letter, Baroness Vere stated that “Most work completed to date has been granted full planning permission.” This is no longer true and Highways England should commit to the position expressed by the Transport Committee in its letter of 23 March 2021, that Permitted Development should only be used “when these historic structures pose an urgent, serious and demonstrable risk to the public”. The consequence otherwise is the disenfranchising of those who have a vested interest in a particular structure. This is compounded by Highways England's unwillingness to publish an updated list of structures currently intended for infilling or demolition.

In 2020, Jacobs sent template letters about 125 proposed infilling and demolition schemes to more than 60 Local Planning Authorities. Great Musgrave bridge was almost certainly targeted because Eden District Council was amongst the minority to authorise schemes without the need for planning permission.

The work was undertaken in pursuit of the objective set out in the 2016 Draft Strategic Plan “to significantly reduce the level of liability and risk to the HE and DfT”. It was effectively a policy decision, taking advantage of the opportunity afforded by Eden District Council.



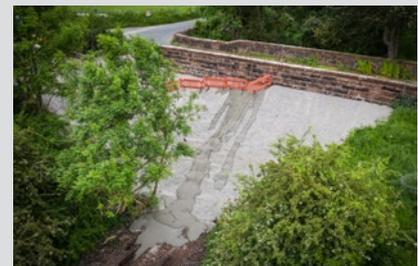
“Many of the bridges to be assessed by this Standard are of considerable age and represent important features of our cultural heritage. Their survival to this day owes a great deal to the care of past generations. Where remedial or strengthening works are found to be necessary, the proposals should reflect the duty to retain the character of these structures for the benefit of future generations. Early remedial measures, which restore the carrying capacity and extend the life of these structures, are preferable to urgent reconstruction, as the former not only prove generally to be more cost-effective, but also retain the existing character of these structures.”

This extract from legacy Standard BD21/01 highlights the then Highways Agency’s ethos behind the management of its ageing bridge stock.

Commentary



Highways England told a number of media outlets that “Through our work we have preserved the structure” in response to criticism over the infilling of Great Musgrave bridge. This suggests a culture that is completely disconnected from reality. How could anyone see ‘preservation’ when they look at these pictures?



This structure was part of our rich industrial heritage, gifted to us by engineers and navvies exhibiting courage, ambition and determination in abundance. Highways England had an obligation to manage it carefully under the terms of Historic England’s mandatory *Protocol for the Care of the Government Historic Estate* which sets out “a consistent, coordinated approach to protecting all heritage assets” and maintaining them “in good repair as part of a sustainable approach to the environment”. Its compliance with this Protocol was last rated at 50%.

Encouraged by the Department for Transport, Highways England has been left to pursue a destructive agenda by Ministers unwilling to ask searching questions. Public money is wasted and assets lost without thought as to the wider impacts.

What happened at Great Musgrave was driven by a mindset which still regards heritage as a liability, reinforced by the outdated HE/DfT Protocol Agreement which determines how the Historical Railways Estate is managed. Despite the climate emergency and the obligations it imposes upon us, there remains within HE/DfT a refusal to accept that the world has changed around them, resulting in community groups being consequently trampled over when they seek to tap into the Estate's potential to help deliver a more sustainable future.



Many Historical Railways Estate structures have been transformed to fulfil roles on active travel routes across the country thanks to agreements with or transfers from British Railways Board (Residuary), who looked after them before the role was passed to the Highways Agency (now Highways England). These photographs show (Left) Hewenden Viaduct in West Yorkshire, (centre) Devonshire Tunnel in Bath and (right) Torksey Viaduct spanning the Nottinghamshire/Lincolnshire border.

For several years now, Highways England has been sporadically infilling and demolishing structures without anybody noticing. That changed with Great Musgrave. But instead of openly admitting that infilling was simply the chosen method of asset management, an alternative reality was constructed whereby the threat posed by the bridge was so great that infilling was inevitable. The conflicting truth was, of course, revealed by every scrap of technical evidence and HE's media statements served only to make it look dishonest or inept.

But they got away with it thanks to the planning failures of Eden District Council.

Highways England was never an appropriate custodian for the Historical Railways Estate. Ministers should immediately pause its infilling and demolition programme whilst an independent review is conducted. The task should then begin of transferring these valuable public assets to a body with the culture and skills to secure the greatest possible social and economic benefit from them.



The HRE Group

The infilling of Great Musgrave bridge (June 2021)

 thehregroup@forgottenrelics.org

 facebook.com/theHREgroup

 twitter.com/theHREgroup

 www.change.org/theHREgroup (ePetition)