
MAINTENANCE OF BRIDGES IN THE SCOTTISH BORDERS

Report by Service Director Assets & Infrastructure

SCRUTINY COMMITTEE

27 October 2016

1 PURPOSE AND SUMMARY

- 1.1 **This report provides information to Members on the Council's bridge assets, including a list of all bridges in the Scottish Borders, current processes for inspection and maintenance, planned investment, key issues around bridge condition and plans for improvement.**
- 1.2 Scottish Borders Council (SBC), under the requirements of the Roads (Scotland) Act 1984, is responsible for maintaining over 1100 bridges and 155 culverts across the region, many of which are ageing and in need of repair, but are of critical importance to the Scottish Borders, both economically and socially.
- 1.3 The current SBC Roads Asset Management Plan helps the Council deliver the road services and details what is required to manage the road network assets, including bridges. However, ensuring that all bridges are inspected regularly to assess condition and then undertaking necessary works is increasingly difficult in the current financial climate.
- 1.4 The current planned investment in bridges and the process around identifying planned maintenance works is presented along with future planned actions around performance reporting.

2 RECOMMENDATIONS

- 2.1 **I recommend that the Scrutiny Committee :-**
 - a) **Notes the size of the bridges asset and the challenges this presents;**
 - b) **Notes the current process for carrying out inspections, for assessing the current condition of the bridges asset and the process used in identifying planned maintenance works;**
 - c) **Notes the improvements being considered to improve data on the overall condition of the bridges asset and subsequent prioritisation.**

3 BACKGROUND

- 3.1 Under the Roads (Scotland) Act 1984, SBC has a duty to maintain roads, bridges and street lighting that are on the list of public roads in the Scottish Borders. This includes over 1100 bridges and 155 culverts spread across a large geographic area. The table below shows the large variety of structures and the number of each:

Type of Structure	Construction Type	Single Span	Multi Span
		No.	No.
Bridges	Masonry Arch	562	63
	Brickwork Arch	50	5
	Concrete Beam / Slab	25	14
	Steel Composite	66	21
	Concrete Box / Pipes	67	19
	Corrugated Pipes	29	
	Others	164	21
	Total	963	143
Culverts (1.0 - 1.5m diameter)	Masonry Arch	73	
	Concrete Pipe	49	
	Corrugated Pipes	10	
	Others	23	
	Total	155	

Note: 57 of these bridges are 'shared' with Network Rail - both parties carry out inspections with SBC responsible for maintenance of any footway and carriageway surfaces. Network Rail are responsible for the structure. Several bridges are also shared with Northumberland County Council, for example Union Chain Bridge and the liability for these falls equally on both Authorities.

- 3.2 Bridges have, like other SBC infrastructure assets such as roads, a limited life and their repair and renewal become necessary due to wear and tear, damage, inclement weather and so on. Additionally, the older bridges were not designed to deal with current volume and weights of traffic, which may lead to more expensive repair requirements.
- 3.3 In order to manage the roads asset (including bridges) more effectively and address Corporate Priority 7 (*Develop our property and assets*), SBC approved a Roads Asset Management Plan (RAMP) in 2014 that identifies the current roads network assets (including bridges) and develops a framework to enhance existing good practice and improve the effectiveness of the operation of the network. The RAMP is designed to

provide the technical detail and operational standards for helping the Council deliver the road service and requires the Managers of road network assets (including bridges) to:

- Carry out inspections
- Record and assess condition
- Ascertain required works
- Identify maintenance and service standards
- Prioritise works programmes
- Design prioritised works
- Issue contracts documents and instruct works
- Site supervision and control

3.4 The RAMP is now one of the key strategic plans to be delivered by the Assets and Infrastructure Service and is the specific responsibility of the Infrastructure team within that Service. However, as with other services across SBC and indeed Local Authorities in Scotland, resource constraints mean that decisions about prioritisation need to be taken to ensure that, first and foremost, public safety is protected but that appropriate network investment enhances the Scottish Borders, both socially and economically.

4 INSPECTION OF BRIDGES

4.1 The Code of Practice for Management of Highway Structures (CoPMHS) recommends that Councils adopt the standards contained within the Code, and specifically for bridges this means:

Table 2 – Structures Inspection Details - CoPMHS		
Inspection Type	Frequency	Notes
General Inspections (GI) (A visual examination of all parts of a structure without using access equipment)	biennially	General Inspections to be carried out for all bridges & culverts of 1m diameter and greater.
Principal Inspections (PI) (a close examination within touching distance to all parts using access equipment)	6 yearly	The Principal Inspections to be undertaken on those larger structures that have been identified as requiring a greater level of assessment.

4.2 Principal Inspection of a bridge asset uses a "Bridge Inspection Pro-Forma" to record a range of information as follows:

- Deck elements
- Abutments / spandrel walls
- Waterproofing / expansion joints
- Carriageway surface
- River bed / wing walls

With the variety in size and nature of more than 1100 structures time taken to undertake a single Principal Inspection can vary between 1 hour and 1 day.

- 4.3 Prior to the formation of the Infrastructure team within the Assets and Infrastructure Service, "Planned Works" were assessed by the previous Bridges Team members following the completion of the recommended inspection process. Prioritisation of works were assessed using the relevant inspection information, along with engineering judgement, knowledge and experience of the condition of the entire Bridge Stock.
- 4.4 Historical inspection information from 2009/2011 is mainly used to make current prioritisation decisions within the Infrastructure team, collated from previous General Inspections and Principal Inspections. However, some works may be prioritised due to specific customer concerns raised about bridge condition, or reports from other Council Officers. Bridge structures tend to degrade slowly so the risk of having no inspection data since 2009/11 is relatively low.
- 4.5 The recognised process leading to the prioritisation of works within the RAMP is based around a clear process of inspection, assessment and prioritisation. Information from inspections on condition is transferred into a programme that generates the Bridge Condition Index (BCI) figures which can then be reviewed for each structure.

This then provides:

- a list of structures requiring work which are prioritised;
- an assessment of the annualised depreciation of the bridge stock;
- an indication of the level of funding required to alleviate this decline.

Although this current recognised process still requires some degree of judgement from engineering professionals, it does give a more comprehensive and transparent basis for decisions to be made.

- 4.6 However, restructuring and budget pressures have meant that the inspections recommended under the CoPMHS have generally not been undertaken since 2009/2011. Whilst the use of data and the RAMP process does ensure that SBC meets its statutory duties, the risks faced by both SBC and road users would be better managed by more regular and planned inspections, in line with CoPMHS recommendations. However, the risks have been recognised within the RAMP and there is a key action to *improve the data inventory of all bridges* (sitting with the Infrastructure team) and a recognition that additional resources would be required to deliver this enhanced inspection regime.

5 INVESTMENT IN BRIDGES

- 5.1 The approximate 'core' annual budget allocation by Scottish Borders Council to bridges is made up as follows:
- Capital allocation of £400,000 per annum
 - Revenue allocation, from Neighbourhood Services and Asset Management budgets of £418,000 per annum
- 5.2 However, on an annual basis, the Council submits financial returns to CIPFA on Whole Government Accounts and part of this requirement allows the Council to report information on investments made on the various asset groups. Actual investment in the bridges asset for financial year 2014/15 is shown in the table below and is considerably higher than the

£818k annual allocation indicated in Section 5.1 (above). This is a result of undertaking the replacement of Carlowse Bridge, Tweedsmuir and associated road diversion works at a cost of £550,846.

Table 3 – Investments	£	%
Total	1,220,953	100%
Planned Maintenance - preventative	£7,000	0.5%
Planned Maintenance - Corrective*	£847,825	69%
Routine Cyclic Maintenance	£57,499	5%
Routine - Reactive Repairs (emergency)	£57,499	5%
Routine - Reactive Repairs (non-emergency)	£244,530	20%
Routine - Inspection & Survey	£6,600	0.5%

Actual investment in the bridges asset for financial year 2015/16 is shown below and again, is higher than the £818k budget due to funding of the replacement Selkirk Footbridge at £700,000 and bridge repairs linked to the major flood events of January and February 2016, £268,452;

Table 4 – Investments	£	%
Total	1,899,931	100%
Planned Maintenance - preventative	£12,000	0.6%
Planned Maintenance - Corrective	£1,224,768	64.5%
Routine Cyclic Maintenance	£61,088	3.2%
Routine - Reactive Repairs (emergency)	£61,088	3.2%
Routine - Reactive Repairs (non-emergency)	£272,535	14.4%
Routine - Inspection & Survey	£0	0%
Improvements	£268,452	14.1%

5.3 The tables above show the actual investments made by SBC (which is considerably higher than the £818k allocated through the financial planning process) and there will always be unplanned events that increase pressure on resources. For example, the storms of December 2015/January 2016 resulted in extensive damage to the roads asset, including the bridges asset. This included:

- Significant damage to Bowanhill Bridge required complete replacement;
- Several culverts required renewal such as Haysike;
- Several bridges had major scour to piers and abutments.

5.4 A number of funding streams have been accessed to deal with the overall

costs as follows:

- Scottish Government Capital Fund for Repairs - £500k
- Re-prioritisation of Capital Plan - £2.4m (£440k for bridges)
- Bellwin – the UK Government’s scheme that supports Council’s in times of Emergency, administered by Scottish Government for Scotland
- The Council’s own Emergency Reserves (£508k incl Roads)

6 CONDITION OF BRIDGES

6.1 At present, the list of planned works within the Infrastructure team is primarily compiled from 2009/11 condition information. Works of considerable scale, value (economically and socially) or that are required due to a public safety issue are carried out using Capital Funding, and smaller refurbishment works, reactive works and routine works are funded from the Revenue Budget.

The extreme floods of last winter necessitated inspection of a number of bridges on the Rivers Tweed, Ettrick, Yarrow and Teviot and some of their tributaries. These inspections have proven to be very useful in providing staff with a better awareness of the condition of a number of bridges.

Knowledge and establishment of the safe load carrying capacity of the Council’s bridges is critical to their effective management. This is particularly so in the context of the many abnormal load movements that take place associated with major wind farm developments, etc. Currently staff are relying upon inspection data from 2009/2011 and records of previous load carrying assessments to determine which bridges are safe to carry heavy loads, but as previously stated in section 4.4, risks are relatively low.

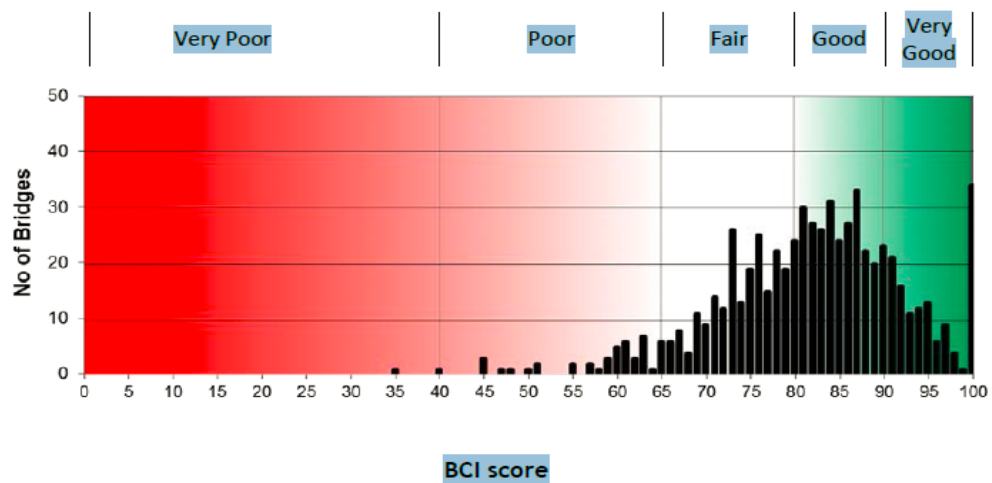
6.2 Performance Information on Bridges

The following table is recommended by the Society of Chief Officers on Transport in Scotland (SCOTS) as a template to be used by Authorities across Scotland. The current SBC Roads Review, due to report to Council in November 2016, includes work underway to address the known gaps around the robustness of performance information on inspections undertaken and condition of bridges, and resources should be identified to carry out inspections in line with the CoPMHS recommendations.

Table 5	Performance measures	Level
Structures Condition	BP1 - Percentage of principal inspections carried out on time	100%
	BP2 - Percentage of general inspections carried out on time	100%
	BP3 - Bridge Stock Condition Indicator (BCIav)	TBA
	BP4 - Bridge Stock Condition Index	TBA

	(BCIcrit)	
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- 6.3 The aspiration is that SBC meets the target levels set by SCOTS around inspections (both GI and PI) and the inspection work done through Bellwin (referred to in section 6.1) has provided a starting point on which Officers can build, but there will be resource challenges around achieving the 100% target and as things stand, Officers would be unable to populate BP3 & 4 (in table above) currently without data.
- 6.4 The following which for clarity, has been extracted from Highland Council Bridges data, is a potential way in which bridge stock condition could, in the future, be presented and could be integrated into the quarterly performance reporting to Executive Committee under Corporate Priority 7 (*Developing our Assets and Resources*) :



7 FUTURE AREAS OF FOCUS IN RELATION TO BRIDGE ASSETS

- 7.1 In order to work towards the SCOTS targets and a regular inspection regime to enhance availability of current data, prioritisation and decision making, it will be necessary to invest in Principal Inspections and £100k has been proposed for 2016/17 covering a limited number of bridges.
- 7.2 Most recently issues highlighted by staff and the public have arisen over the condition on two bridges, Clackmae, on the back road between Earlston and Lauder, and Melrose Bridge (known locally as Lowood Bridge), on the link road between Melrose and the Langlee area of Galashiels. Officers have engaged two consultants AECOM and Fairhurst's to carry out detailed surveys, cores and assessment of the bridges and to bring forward recommendations on repair.
- 7.3 Early indications show that Clackmae is in very poor condition, which has necessitated the placement of traffic lights and narrowing of the bridge to hopefully reduce further deterioration. Engineers are assessing the extent of repairs required, but these may be significant, circa £500k.
- 7.4 Melrose Bridge, which carries significant traffic movement between Melrose and east area of Galashiels, is also showing signs of deterioration, the parapet walls have a severe lean, the north arch has significant cracking and both arches have extensive areas of mortar loss. Engineers are

assessing the extent of repairs required together with whether a weight limit is required on the structure prior to repair works being carried out. The cost of repairs will be significant for this structure, access will be particularly difficult and any closures to the bridge will have significant impact on the surrounding area, repairs could be circa £800k.

- 7.5 The recent works identified as required on both Clackmae and Melrose bridges are examples of risk to SBC which has not been identified. This creates pressures on SBC, and demonstrates that the annual core budget may be insufficient to perform the required level of inspections and undertake all of the works required, competing as it does against other Council priorities.

8 CONCLUSIONS

- 8.1 Within the Asset and Infrastructure Service, the need to inspect bridges in line with the CoPMHS recommendations has been recognised, and the current Roads Review should identify some additional resources in order that this can be carried out, in line with the priorities within the RAMP, with a balanced approach to risk and planned investment.
- 8.2 On an annual basis, following inspection, officers will complete on an annual basis, the performance reporting table as promoted by SCOTS and look to integrate this into the existing performance reporting to Executive Committee.
- 8.3 Principle Inspections will populate the major investment plan for the bridges asset, linked to the Capital Financial Plan. However, distribution of funds will continue to be targeted towards those bridges which the Infrastructure team considers to be in urgent need of repair. Until such time as officers have a fully developed inventory of asset condition, this consideration will continue to be determined, using existing condition data, adhoc inspections, engineering knowledge and experience.

9 IMPLICATIONS

9.1 Financial

The 'report' is supported by the agreed Capital Plan of the Council.

9.2 Risk and Mitigations

There is a risk that, by not carrying out regular inspections as per the CoPMHS, condition of the bridges asset remains unquantifiable. There is a risk that a bridge may fail causing serious injury or loss of life, and require road closures to be implemented perhaps leading to long diversions and significant disruption to communities in the Scottish Borders. There is also the risk that repair costs will significantly increase with time.

Whilst the perception that the current risk to the public is minimal, the recommended bridge inspections are required to demonstrate that the risk to the Council is minimised.

The most recent internal audit carried out on the RAMP noted progress and implementation of the agreed actions.

9.3 Equalities

There are no direct equalities issues as a result of this report

9.4 Acting Sustainably

The implementation of the RAMP review will consider any economic, social or environmental effects of potential investments made in the road asset.

9.5 Carbon Management

There are no direct carbon management impacts as a result of this report.

9.6 Rural Proofing

The implementation of the RAMP will consider the impact on rural communities and take recognition of condition of bridges on roads which are the only route to these communities.

9.7 Changes to Scheme of Administration or Scheme of Delegation

There are no changes which are required to either the Scheme of Administration or the Scheme of Delegation as a result of the proposals in the report.

10 CONSULTATION

10.1 The Chief Financial Officer, the Monitoring Officer, the Chief Legal Officer, the Chief Officer Audit and Risk, the Chief Officer HR and the Clerk to the Council have been consulted and any comments incorporated into the final report.

Approved by

Martin Joyce

Service Director – Asset & Infrastructure

Signature

Author(s)

Name	Designation and Contact Number
Colin Ovens	Infrastructure Manager Tel 01835 826635

Background Papers: None

Previous Minute Reference: None

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