

Agenda Item	12
Report No	ECI/33/22

HIGHLAND COUNCIL

Committee: Economy and Infrastructure

Date: 10 November 2022

Report Title: Road Structures Annual Report

Report By: Executive Chief Officer Infrastructure, Environment & Economy

1 Purpose/Executive Summary

- 1.1 This report provides an outline of the Council's bridge stock, its condition, the bridge inspection regime, and the works associated with maintaining road structures.

The report also provides recommendations for projects to be included in the “Bridges, Retaining Walls and Culverts” line, of the Roads and Infrastructure Capital Programme.

2 Recommendations

- 2.1 Members are asked to:-

- i. **Note** the position of the Bridge Stock Condition Indicators in Highland; and
- ii. **Note** the current position in Highland in relation to the number of structures inspections undertaken.

3 Implications

- 3.1 **Resource** – The bridge maintenance plan is funded through the Capital Programme. The current allocation for 2022/23 until 2027/28 is currently £3.68m for medium schemes and £25m for major projects. The bridges, retaining walls and major culverts are prioritised by the risk and consequence of failure. This list is then used to inform the programme of maintenance and replacement works.
- 3.2 **Legal** – The Council has a duty to maintain structures to a reasonable standard and to manage risk effectively.

- 3.3 **Community (Equality, Poverty, Rural and Island)** – Due to the geographic nature of Highland, many structures are located in remote areas where failure may result in communities being cut off or having to travel significant distances via alternative routes.
- 3.4 **Climate Change / Carbon Clever** – There are no known Climate Change / Carbon Clever, implications arising as a direct result of this report. Although improving road structures is unlikely to have a significant effect on carbon emissions, keeping the road network in a condition which allows the free flow of traffic will assist in reducing them.
- 3.5 **Risk** – Although not specifically mentioned in Corporate Risk 10 (CR10) Condition of our Roads in the Corporate Risk Register, structures are a vital part of the road network and require active management.
- 3.6 **Gaelic** – There are no known Gaelic implications arising as a direct result of this report.

4 Highland Council Road Structures Information

- 4.1 The Roads (Scotland) Act 1984 states that a local roads authority shall manage and maintain roads within their area that are included in the list of public roads, more commonly known as ‘adopted roads’. As Members will already know, Trunk Roads are maintained by the Scottish Ministers through various contracts across Scotland.
- 4.2 Structures are part of the road asset. The term ‘road structure’ is used to describe bridges, culverts and retaining walls. Cattle grids are also included. Not all road structures which carry or hold up an adopted road are in the ownership of the Council.
- 4.3 A table showing the numbers and types of road structures the Council is responsible for is shown below (2021/22 figures from asset valuation calculations).

Structure Type	Quantity
Road Bridges	1691
Footbridges	34
Unusual Structures	103
Retaining Walls	1,076
Culverts	459
Cattle Grids	597
Total	3,960

(Note: the majority of ‘Unusual Structures’ are listed bridges with 3 being post tensioned bridges.)

- 4.4 The Gross Replacement Cost (GRC) of the structures stock calculated for 2020/21 is £643,967,392. This figure fluctuates as data on the stock is refined (2021/202 data not yet available).

- 4.5 Additionally, cattle grids are structures on roads which the Council also have a responsibility for. Traditionally, they have not been included in the structures budget but have been replaced using revenue money from the roads budget. There are currently 597 listed in the asset management database. Cattle grids are not included in the structures GRC figure above as they are accounted for separately due to the way Whole of Government Accounts requires it to be recorded. The 2020/2021 GRC for grids is £6,567,000 (2021/2022 data not yet available).
- 4.6 The figures contained in this report do not include other bridges the Council may be responsible for, only those considered to be 'adopted' under the Roads (Scotland) Act 1984. Other bodies may own or be responsible for structures which carry the public road. Network Rail and Scottish Canals are examples of organisations responsible for some bridges on the adopted road network.

5 Inspections

- 5.1 Members approved the 'Structures Inspections' policy at Environment, Development and Infrastructure Committee in August 2019 to move towards a risk-based approach to inspections. Inspections are generally undertaken within a calendar rather than financial year. This is to allow for programming. This policy includes Principal Inspections (PI's) undertaken predominantly by specialist structural engineers and the more routine General Inspections (GI's) undertaken predominantly by the Structures Technicians.
- 5.2 As inspections are undertaken with limited amounts of personnel (including individuals as per the lone working policy), they have continued through the current Covid-19 situation. The use of the underbridge vehicle has continued this year after the delays last year due to Covid restrictions and the inability to travel, although there was some disruption due to the national shortage of HGV drivers.
- 5.3 The four additional Structures Technician posts have resulted in an increase in the number of General Inspections completed since their appointments. The GI figures below will include inspections of structures not programmed for this year, as the technicians address the backlog. See the performance figures in 7.2 of this report where the General Inspections completed have increased significantly.

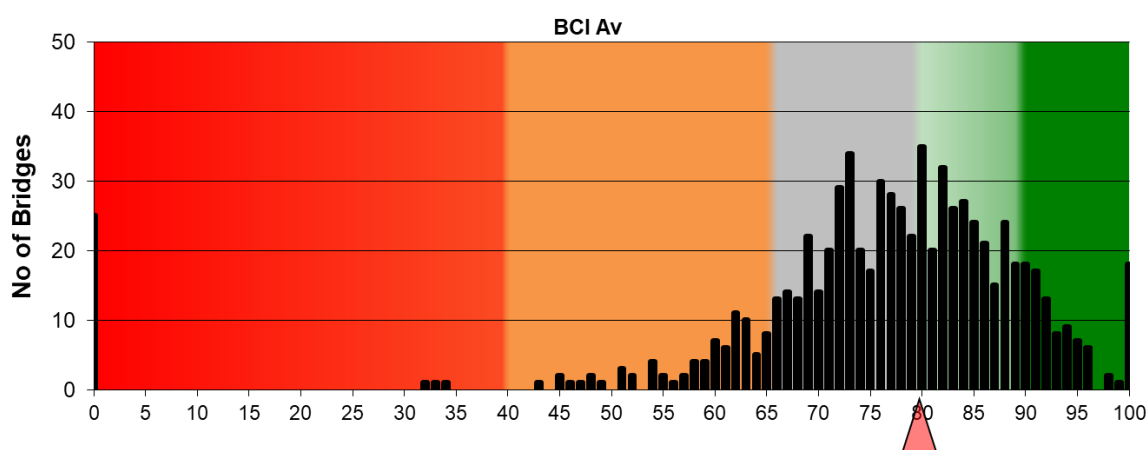
Bridges, Culverts and Retaining Walls		
Inspections	Due in 2022	Inspected (as at 01/10/22)
PI	60	100
GI	226	85
Totals	286	185

GI figures are low this year as two Structures Technicians have left their posts. Recruitment is underway to replace them.

6 Bridge Stock Condition

- 6.1 A Principal Inspection (on bridges 5m or more in length) generates a Bridge Condition Index (BCI) for the inspected bridge. This is used to calculate the Bridge Stock Condition Index (BSCI), an indicator of the overall condition of the Councils bridge stock. Both these indexes have an Average (based on the condition of the whole structure) and a Critical (based on the condition of the main structural elements).

The distribution of BCI Average values for each bridge which has had a PI are shown in the diagram below. The 2021/22 Highland BSCI average is 78.8 and BSCI critical is 64.7.



7 Performance Indicators

- 7.1 Highland completes and returns an APSE/ SCOTS performance questionnaire annually. This questionnaire has evolved over the years and has been partly developed through the SCOTS Road Asset Management project.
- 7.2 The 2021/22 Highland results had not yet been submitted to APSE/ SCOTS at the time of writing this paper. Therefore, the previous 3 years data for some of the performance indicators relating to structures is shown in the table below, along with the provisional 2021/22 results (all 4 years data for Highland).

APSE/ SCOTS PI	2018/19	2019/20	2020/21	Provisional 2021/22 Result
% of Principal Inspections carried out on time	100.0	100.0	99.1	96.8
% of General Inspections carried out on time	88.7	100.0	100.0	100.0
BSCI average	79.6	79.0	79.0	78.8
BSCI critical	65.3	64.0	64.0	64.7
% of Council owned bridges failing European standards	10.0	10.0	9.9	11.4
% of Council road bridges with unacceptable weight, height or width restriction	0.3	0.2	0.2	0.2

The table below shows the 2020/21 results for the SCOTS Family Group (Rural), and the Scotland averages. The 2021/22 results have not yet been verified by APSE/ SCOTS at the time of writing this report so are not currently available. The other rural family group members are Aberdeenshire, Angus, Argyll and Bute, Scottish Borders, Dumfries and Galloway, Moray and Perth and Kinross.

APSE/ SCOTS PI	Family Group Average	Scotland Average
% of Principal Inspections carried out on time	69.3	82.8
% of General Inspections carried out on time	62.7	74.8
BSCI average	83.1	86.5
BSCI critical	71.8	76.2
% of Council owned bridges failing European standards	4.1	3.06
% of Council road bridges with unacceptable weight, height or width restriction	0.36	1.8

Notes re the Performance Indicator results:-

- % of PIs on time: a higher percentage is a better result
- % of GIs on time: a higher percentage is a better result
- BSCI average: a higher value is better (this is not a percentage but a score out of 100)
- BSCI critical: a higher value is better (this is not a percentage but a score out of 100)
- % failing Euro standards: a lower percentage is better
- % unacceptable restrictions: a lower percentage is better

8 Works Programmes

8.1 Works on Council road structures can be considered to fall into five streams, depending upon funding source:-

- minor works and maintenance;
- small and medium schemes;
- major bridge schemes;
- other structure schemes; and
- third party schemes

8.2 Minor Works and Maintenance

Minor works and maintenance of road structures are managed by the local Roads Area offices and are funded from their individual revenue budgets, reported separately.

8.3 **Small and Medium Schemes**

Small and medium schemes are managed by the Structures Section and are paid for from the Roads Service's base Capital budget of £7.2M, to allow for prioritisation of works across the asset. The allocation has been £650k per year from 2018/19, as agreed at 7 March 2018 Special Meeting of the Highland Council for the Capital Programme 2018/19 to 2022/23.

At 9 December 2021 Highland Council Committee, the Members decided to reduce this amount starting in 2023/24, back to £330k per year in the capital programme. These projects are accounted for under the 'bridges retaining walls and culverts' line of the capital programme.

An additional one-off amount of £1.79m was added to this budget in 2021, spread across eight schemes, as part of an award from the Scottish Local Bridge Maintenance fund. The conditions of the award include that it must be spent before March 2023. Because some of the schemes have been delayed, it is intended to seek an extension on the spending deadline for the fund.

The Structures Section maintains a prioritised list of schemes for this budget, which is regularly reviewed and updated. New schemes are added from time to time, typically due to bridge deterioration or damage due to vehicle strikes. A full copy of the list is given in **Appendix 1** of this report. The amount of work on the list currently stands at £7.758m.

During the year to 30 September 2022, repairs to Tordarroch Bridge were completed enabling the bridge to reopen. Nine new schemes were added. Two of these, Averon Footbridge and Lealty Bridge, required immediate emergency propping for safety.

There is a full programme of bridge maintenance planned in 2023/24 and 2024/25 using the available resources.

8.4 **Major Bridge Schemes**

Major bridge schemes are capital funded and include all bridge works that are too large to be funded from the budget for small and medium schemes. Major bridge schemes are proposed by the Structures Team and must be approved by Members before commencement. A full list of approved and proposed major bridges is given in **Appendix 2**.

There are currently six major schemes on the capital programme, which were approved at the Highland Council December 2021 meeting:-

- B863 Invercoe Bridge replacement started on site in December 2021 and is due for completion in March 2023. This structure was awarded £4.137m from the Scottish Governments Local Bridge Maintenance Fund.
- A836 Naver Bridge Replacement is in design with the project expected to go to tender in Jan 2023, with works commencing in early summer 2023.
- Ruthven Spey Bridge surfacing repairs are currently under design with repairs expected in 2023.
- The other current major schemes are at the initial preparatory phases, with detailed design yet to start.

- A general “Major Bridges” line in the capital programme was added in December 2021 to cover major bridges schemes in the medium term.
- In the forthcoming capital review, Structures Section has proposed a number of schemes to meet the needs of the prioritised bridge maintenance programme. These are detailed in **Appendix 2**.

8.5 **Other Schemes**

A number of structures schemes are being progressed in response to additional funding received by the Council.

The Structures Section are currently coordinating work to spend part of the £3.5m Health and Prosperity Strategic fund which was allocated to structures. The exact scope of work is not yet finalised. It is expected that the bulk of the funding will be spent on resurfacing and re-waterproofing of approximately twelve bridge decks across Highland, and major masonry repairs to approximately six masonry arches.

A scheme to refurbish Infirmary footbridge in Inverness is in development, with work expected in 2023. This project is funded from the Strategic Roads Capital Budget (approved at E&I Committee on 5 May 2021, ECI/15/21).

8.6 **Third Party Schemes**

Third party schemes are works on Council bridges that are carried out by others such as wind farm developers or the Strategic Timber Transport Scheme. Several such schemes may be carried out in a typical year. In all cases, the Council Structures Section carries out the role of Technical Approval Authority to ensure that designs are carried out to the standard required for public roads.

9. **Structural Assessments**

- 9.1 Structural assessments are required to determine the load bearing capacity of a structure in relation to carrying traffic loading, this will influence capital expenditure and works. These are different to inspections which identify defects. Assessments are not required for every load carrying structure and the programme will be determined on a technical need's basis. Depending on the result of an assessment, restrictions such as a weight limit may need to be imposed on a structure prior to any further capital improvement works.
- 9.2 As part of the process for determining works required, it is proposed to include some additional structural assessments in the programme from the capital budget. Where possible, other funding for assessments is also utilised, which may be through developers, abnormal load movements or timber transport schemes. As assessments vary in complexity, a set amount of funding will not be indicated but the work will be determined from a list of assessments required and contained within the amended £330k capital budget allocation.

Designation: Executive Chief Officer Infrastructure, Environment & Economy

Date: 3 October 2022

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Background Papers: [TEC 77/13 Cattle and Deer Grids Policy](#)
[COM 58/15 Bridges and Road Structures](#)
[EDI 23/17 Road Structures Annual Report](#)
[EDI 81/18 Road Structures Annual Report](#)
[EDI 61/19 Risk Based Approach to Structures Inspections](#)
[EDI 83/19 Road Structures Annual Report](#)
[ECI 18/20 Strategic Timber Transport Scheme 2020/21](#)
[ECI 38/20 Road Structures Annual Report](#)
[HCI/17/21 Levelling Up Fund and Community Renewal Fund](#)
[ECI/15/21 Strategic Road Schemes – Capital Allocation](#)
[ECI/35/21 Roads and Transport Transformation and Roads
Capital Allocation Update](#)
[ECI/53/2021 Road Structures Annual Report](#)
[HC/33/21 Medium Term Financial Plan- Capital Strategy and
Capital Programme to 2036/37](#)

Appendix 1 – List of Road Structures Small/Medium Schemes ('bridges, retaining walls and culverts')

	Scheme	£k	Comment
1	U1104 Tordarroch Bridge	325	Repair and strengthening of masonry arch. Works completed. Bridge reopened.
2	B861 Ness Bridge PTSI & Assessment	365	Inspection, assessment and special investigation as precursor of possible major works.
3	* Averon Footbridge, Alness	400	Emergency propping added to stabilise structure. Repair or replacement required.
4	* U1990 Lealty Bridge Repairs	330	Emergency propping added to stabilise masonry structure. Full replacement required.
5	* C1119 Balnaan Bridge Half Joint Assessment	60	Inspection and assessment as precursor of possible major works
6	* A896 Balgy Bridge Half Joint Assessment	67	Inspection and assessment as precursor of possible major works
7	* A831 Polmaily to Kilmartin Bridge Repairs	740	Refurbishment of four bridges (two deck replacements, two re-waterproofing).
8	A838 Kyle Of Tongue West Joint Replacement	80	Replacement of worn-out joints
9	A836 Vagastie & Inchkinloch Bridge Repointing	120	Minor refurbishment works of two masonry arch bridges
10	A835 Knockan Bridge Parapet Replacement	385	Parapet replacement with associated deck strengthening
11	A835 Ledmore Parapet Replacement	310	Parapet replacement with associated deck strengthening
12	A832 Grudie Bridge Refurbishment (Lochluichart)	500	Investigation into concrete bridge to enable decision on further works
13	A862 Lovat Pier Strengthening	205	Repair to multi-span masonry arch
14	* B8057 Firemore Bridge Deck Replacement	415	Bridge deck replacement
15	A832 Poolewe Bridge Concrete Repairs	182	Investigation required to determine repairs. Difficult access.
16	* B9007 Airdrie Mill Burn Repairs	200	Repair or replacement of masonry arch
17	U3267 Achvaich	231	Replacement of minor bridge structure with culvert
18	C1087 An Uillt Bhig Bridge Strengthening	360	Repairs and strengthening of masonry arch bridge
19	* C1150 Loin and Bracora Bridges Redecking	170	Replacement of two minor bridge decks
20	A863 Caroy Bridge Refurbishment	100	General refurbishment. Exact scope of repairs to be determined.
21	A838 Achfary Bridge Refurbishment	550	General refurbishment. Exact scope of repairs to be determined.
22	* U1423 Allt Currachan Bridge	315	Temporary bridge over arch structure in poor condition. Solution to be determined.
23	A855 Leasgary	410	General refurbishment. Exact scope of repairs to be determined.
24	B970 Nethy Bridge Repointing	140	Repointing of masonry
25	U1097 Dublin Bridge Repairs	306	General refurbishment. Exact scope of repairs to be determined.
26	A861 Gour Bridge Refurbishment	247	General refurbishment. Exact scope of repairs to be determined.
27	A839 Pittentrail Bridge Refurbishment	125	General refurbishment. Exact scope of repairs to be determined.
28	A861 Ceol Na Mara & Camuschork Refurbishments	120	General refurbishment. Exact scope of repairs to be determined.
	Total	7758	

* Asterisk denotes new schemes added to the list in the year to 30 September 2022

Appendix 2 – List of Current and Proposed Major Bridge Schemes on the Capital Programme

Scheme	£k	Status	Comment
B863 Invercoe Bridge, Lochaber	6,069	Approved	Works currently underway to replace bridge. Completion expected March 2023. Budget surplus of approximately £4.137m due to Local Bridge Maintenance fund (see schemes marked * below).
B9090 White Bridge	265	Approved	Additional works to repair old masonry arch, following opening of replacement structure. Works expected 2023.
Dulsie Bridge	469	Approved	Ongoing monitoring pending decision on permanent repairs.
A884 Acharn Bridge	1,159	Approved	Refurbishment, not expected to commence until 2027 at earliest.
A884 Achnagavin Bridge	941	Approved	Refurbishment, not expected to commence until 2027 at earliest.
Ruthven (Spey) Bridge	230	Approved	Repairs required following premature breakdown of road surfacing.
Naver Bridge	7,066	Approved	Design currently underway. Works expected to start 2023.
Major Bridges 2022-2037, unallocated	17,444	Approved	Shown on capital programme, not yet allocated to specific projects.
* A836 Bonar Bridge Repainting	1,200	Proposed	Proposed new repainting scheme (funded from Local Bridge Maintenance fund surplus).
* C1152 Spey Bridge Cromdale Repairs	1,655	Proposed	Proposed new repair scheme (funded from Local Bridge Maintenance fund surplus).
* B863 Kinlochleven Viaduct	1,140	Proposed	Proposed new repair scheme (funded from Local Bridge Maintenance fund surplus).
** A832 Moy Bridge Replacement	11,035	Proposed	Proposed new scheme to replace deteriorated and weight restricted structure on the NC500 route (to be funded by reallocating from Major Bridges line above).
** A894 Kylesku Bridge Re-waterproofing	800	Proposed	Proposed new scheme to carry out essential maintenance on lifeline structure on NC500 route (to be funded by reallocating from Major Bridges line above).

*Proposed new schemes to be funded from LBM surplus

** Proposed new schemes to be funded from the 2022-37 capital programme (reallocation of Major Bridges line)