

Agenda Item	11
Report No	ECI/50/24

Committee: Economy and Infrastructure

Date: 14 November 2024

Report Title: Road Structures Annual Report 2024

Report By: Assistant Chief Executive - Place

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.

It provides recommendations for projects to be included in the "Major Bridges" line and 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 current position in Highland in relation to the number of structures inspections undertaken (see section 6.2);
- ii. **Note** the position of the Bridge Stock Condition Indicators in Highland (see section 7); and
- iii. **Note** the risks that are carried by the Council in relation to its road structures (see section 3.3).

3 Implications

3.1 **Resource** – The bridge maintenance plan is funded through the Council's Capital Programme. The current agreed five-year programme for 2024/25 to 2028/29 includes an allocation of £21.091m for bridges. In addition, the Roads Structural capital budget includes an allocation of £541k for 2024/25.

A prioritised list of projects is given within **Appendices 1 and 2**, with a line added to indicate the limits of affordability. Projects below the line highlight the scale of further pressures on future funding and the need to assess structural condition and consider measures to ensure public safety. Maintenance and repair projects can be accelerated should funding be available

3.2 **Legal** – The Council has a duty to maintain structures to a reasonable standard and to manage risk effectively.

3.3 **Risk** – The Council currently carries risks in relation to its bridge stock. Bridges are not explicitly mentioned in the Council’s corporate risk register but would be covered by corporate risk number CR10 ‘Condition of our Roads.’ The aim of this section is to elaborate on the current risks.

Listed below are the main categories of risk carried by the Council in relation to its bridge stock. Work is currently underway to improve the gathering and recording of data from inspections with a view to better quantifying these risks. Due to resource constraints, and the timeframe over which the full inspection cycle runs, it is likely to be well over ten years before some of the risks below can be reasonably quantified. The present report is therefore limited to a qualitative treatment of those risks.

The main categories of risk that exist in the Council’s bridge stock are:-

- **Confirmed sub-standard structures without mitigation**
These are structures that have been confirmed, either by structural assessment or by virtue of an obvious defect, as being unable to carry full traffic loading whilst maintaining the requisite factor of safety. If no mitigation such as a weight restriction is imposed, then the structure must be considered to be operating with a sub-standard factor of safety. Examples of structures that fit this category would be some bridges on lifeline roads which provide the only link to communities, and have failed assessment, but where no weight limit has been imposed due to the disruption it would cause.
- **Provisionally sub-standard structures**
These are structures where it is suspected that if a structural assessment were carried out, they would be deemed sub-standard. The nature of the risk is the same as for confirmed sub-standard structures, described above.
- **Emerging Liabilities**
This category of risk covers structures that are likely to need significant refurbishment work or replacement before the forecast funding allows us to address them. The risks associated with these structures are of future deterioration leading to weight restrictions, closure or collapse. Examples of structures that fall into this category are given in **Appendix 3**. This risk can be best addressed by increasing the budgets for bridges.
- **Structures with sub-standard parapets**
This category of risk is for structures where the parapets are sub-standard. The risks associated with sub-standard parapets include increased potential for vehicle incursion and injury to occupants. It is suspected that this risk exists at a high proportion of Highland structures, but the extent is not yet quantified. A process for assessing and eventually quantifying this risk is currently in development.
- **Structures susceptible to scour**
This category of risk is for structures with increased potential of collapse due to undermining of the foundations. A process for assessing and quantifying this risk is currently in development.

- 3.4 **Health and Safety (risks arising from changes to plant, equipment, process, or people)** – An update is planned to the inspection procedure, OP 708, which will improve the way cattle grid inspections are managed and programmed.
- 3.5 **Gaelic** – There are no known Gaelic implications arising as a direct result of this report.

4 Impacts

- 4.1 In Highland, all policies, strategies or service changes are subject to an integrated screening for impact for Equalities, Poverty and Human Rights, Children’s Rights and Wellbeing, Climate Change, Islands and Mainland Rural Communities, and Data Protection. Where identified as required, a full impact assessment will be undertaken.
- 4.2 Considering impacts is a core part of the decision-making process and needs to inform the decision-making process. When taking any decision, Members must give due regard to the findings of any assessment.
- 4.3 This is an update report and therefore an impact assessment is not required.

5 Highland Council Road Structures Information

- 5.1 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’. Trunk Roads are maintained by the Scottish Ministers through various contracts across Scotland.
- 5.2 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.
- 5.3 A table showing the numbers and types of road structures the Council is responsible for is shown below:-

Structure Type	Quantity
Road Bridges	1732
Footbridges	35
Unusual Structures	103
Retaining Walls	1,076
Culverts	441
Cattle Grids	593
Total	3,980

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

- 5.4 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.

6 Inspections

6.1 **Inspection Procedure** - Road structures are subject to routine inspection in accordance with the Council's Structures Inspection Policy.

6.2 **Routine Inspections** - The following table summarises the progress on the inspection of bridges, culverts and retaining walls for the current year, 2024/25:-

Inspections of Bridges, Culverts and Retaining Walls			
Scheduled Inspections	Due in 2024/25	Inspected (at 27/09/2024)	% Inspected (at 27/09/2024)
PI	114	66	57.9%
GI	452	242	53.5%
Totals (PI + GI)	566	308	54.4%

GI = General Inspection (a visual inspection, usually by a Structures Technician).
PI = Principal Inspection (a more detailed inspection, by the Structures Team).

Completion figures are slightly low for the time of year. This is due to staff vacancies earlier in the year. The vacancies are now filled, and it is anticipated that all scheduled inspections will be completed.

6.3 **Non-routine Inspections** - In addition to the routine inspection programme, special inspections are occasionally required in response to incidents or concerns raised. The number of such inspections is not currently recorded.

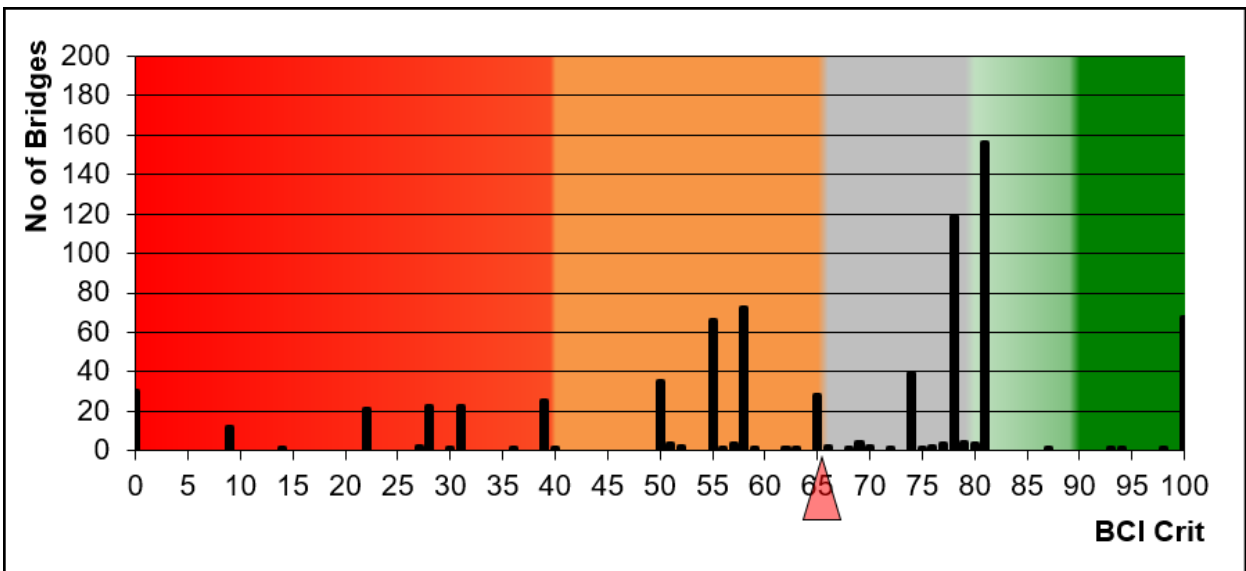
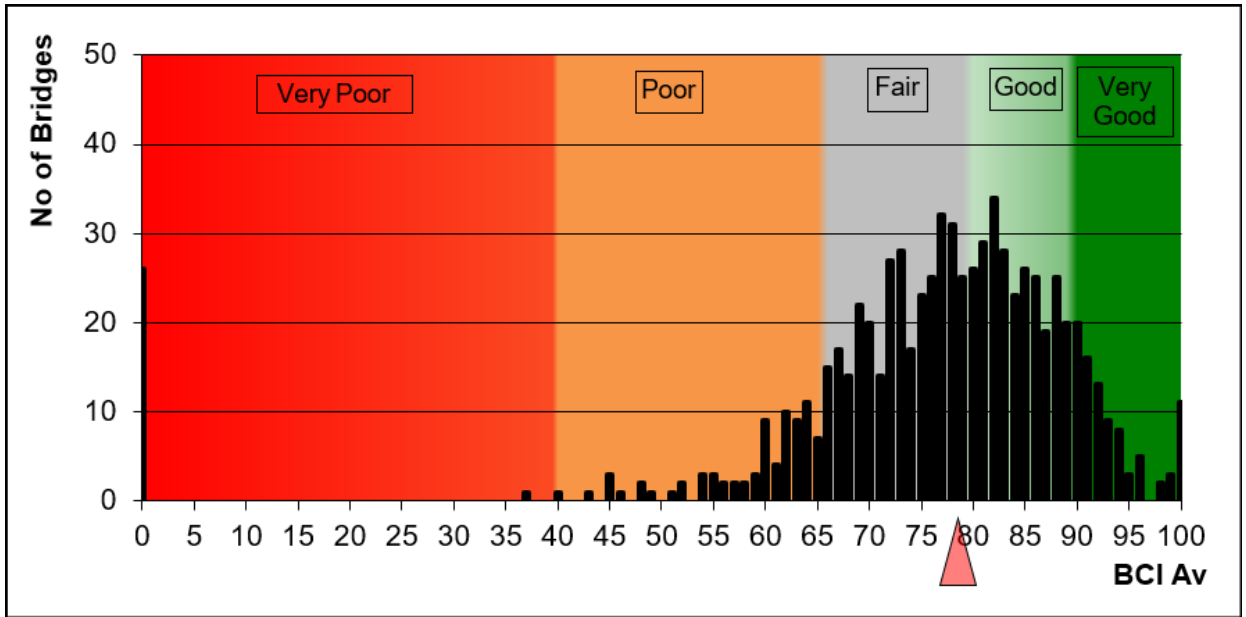
7 Bridge Stock Condition

7.1 A routine principal or general inspection generates condition scores for each element of the bridge. From these scores, two Bridge Condition Indices (BCI) are calculated for each bridge:-

- 'BCI avg' score is based on the average condition of the whole bridge; and
- 'BCI crit' score is based on the worst condition of the main structural elements.

The average of the BCI scores for every bridge in the Council's bridge stock gives the Bridge Stock Condition Index (BSCI), an indicator of the overall condition of the Council's bridge stock, with a score from 0 (bad) to 100 (good). The BSCI values vary with time as inspections are carried out and data is updated.

The current Highland BSCI average is 78.7 and BSCI critical is 65.2. The following charts illustrate the distribution of BCI scores for the Council's bridges:-



8 Performance Indicators

- 8.1 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.
- 8.2 The following table shows key performance indicators for Highland Council Structures, together with a comparison against averages for the SCOTS family group (rural) and Scotland as whole. For convenience, areas where the Highland Council indicators are better than average are shaded in green and areas that are worse in red.

Performance Indicators for Highland Council Structures						
APSE/ SCOTS PI	Highland Council				Family Group Avg.	Scotland Avg.
	2020/21	2021/22	2022/23	2023/24		
% of PIs carried out on time	99.1	96.8	92.5	48.9	67.7	62.1
% of GIs carried out on time	100.0	100.0	54	53.5	83.1	84.7
BSCI average	79.0	78.8	79.5	78.7	83.5	86.7
BSCI critical	64.0	64.7	65.7	65.2	71.7	76.2
% of Council bridges failing EU standards	9.9	11.4	9.7	9.7	3.41	2.2
% of Council road bridges with unacceptable weight, height or width restriction	0.2	0.2	0.2	0.2	0.4	1.4
<p>Notes on the performance indicators</p> <ol style="list-style-type: none"> 1. PI = Principal Inspection, GI = General Inspection; a higher % complete is a better result. 2. BSCI = Bridge Stock Condition Indicator (a numerical score out of 100 representing of the overall condition of the Council's bridge stock); a higher score is a better result. 3. % failing standards and % with unacceptable restrictions; a lower % is better. 						

8.3 Explanation for performance indicators below average:

The recent decline in performance in 2022/23 and 2023/24 for % of inspections complete was due to inspector vacancies in 2023 and 2024. Since August 2024, those vacancies have been filled and the % of inspections complete is expected to rise towards the target of 100% for 2024/25.

The below average performance for BSCI (bridge stock condition indicators) and for % of bridges failing EU standards is a long-term situation in Highland. This is due to the underlying poor overall condition of many bridges within the Council's stock. The statistics show this trend is static, with only slight variations from year to year.

9 Works Programmes

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

- Minor works and maintenance (see 9.2);
- Small and medium schemes (see 9.3);
- Major bridge schemes (see 9.4);
- Other schemes (see 9.5); and
- Third party schemes (see 9.6)

9.2 Minor Works and Maintenance

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

9.3 Small and Medium Schemes

Small and medium schemes are funded from the 'bridges, walls and culverts' line under the Roads service's capital budget. The Road's service total capital allocation for 2024/25 is £19.1m, however the amount available for bridges, walls and culverts for 2024/25 is **£541k**.

The prioritisation list

The Structures Section maintains a prioritised list of schemes for this budget. This is not intended to be a strict order in which schemes will be progressed but provides indicative priorities for programming. New schemes are added from time to time as conditions change. A full copy of the list is given in Table 1.1 in **Appendix 1** of this report. The backlog of work on the list currently stands at **£8.527m**.

Schemes not on the prioritisation list

Schemes are sometimes progressed under this budget without being on the prioritisation list. The reasons for this may be to leverage funding opportunities or to address urgent repairs after an incident. A list of such schemes is given in Table 1.2 of **Appendix 1** of this report.

9.4 Major Bridge Schemes

Major bridge schemes are funded from the Council's current five-year capital programme, 2024/25 to 2028/29. The total allocation for major bridges in the programme is **£21.1m**. For convenience, an extract from the programme is included in the following table:-

Capital Allocation for Major Bridges 2024/25 to 2028/29 (£'000)						
Major Bridge Schemes	2024/ 25	2025/ 26	2026/ 27	2027/ 28	2028/ 29	Totals
Named projects:						
B863 Invercoe Br. Replacement	120	-	-	-	-	120
A836 Naver Bridge Replacement	6,900	4,600	-	-	-	11,500
Infirmiry Bridge Repairs	535	-	-	-	-	535
Other major bridges	1,788	1,787	1,787	1,787	1,787	8,936
Major bridges TOTAL	9,343	6,387	1,787	1,787	1,787	21,091

The figures in the above table are extracted from the agreed five-year capital programme, 2024/25 to 2028/29, from Appendices A and B of committee report [HC/31/23](#), agreed at Full Council meeting on 14 of September 2023.

The following points provide progress updates on the major bridge projects in the current five-year capital programme:-

- **B863 Invercoe Bridge replacement:** Project completed in April 2024. The remaining costs are for retention and closing of land transactions.
- **A836 Naver Bridge replacement:** Construction commenced in July 2024 and completion is expected in early 2026.
- **Infirmity Bridge Repairs:** Design of the repairs is not yet started and is now expected to start in 2025/26. The repairs are only intended to rectify safety issues, and major refurbishment or replacement is still required. Replacement is the recommended course of action.

Updates on projects under 'other major bridges' line:-

- **A831 Glenurquhart Polmaily to Kilmartin Bridges:** This project has now been reduced in scope to comprise the replacement of one bridge deck, and re-waterproofing of three other decks, all small spans. Work started in July 2024 and is expected to complete in November 2024.
- **A836 Bonar Bridge Repainting:** Early structural assessment work began in August 2024 to determine how the bridge may be safely encapsulated (wrapped in sheeting, whilst avoiding excess wind loading). Repainting is expected to take place in summer 2026.
- **B861 Ness Bridge:** This bridge has half-joints and post-tensioning, which require careful management. As such, detailed investigations were undertaken in 2023, and a structural assessment was completed in September 2024. Whilst most of the results were positive, this work has identified some concerns which require more investigation. Further assessment, investigation and refurbishment works are planned for 2025 and 2026.
- **Feasibility studies:** It is planned to carry out studies on the B863 Kinlochleven Viaduct, A890 Strathcarron Bridge and C1152 Spey Bridge at Cromdale. These studies may comprise structural assessment, site investigation and initial design work. Once these studies are complete, the Structures Section will be able to recommend which schemes and options should be added to the Capital Programme. There is currently only sufficient money in the capital programme to progress feasibility work for these bridges.

A full list of approved and proposed major bridges is given in **Appendix 2**. The amount of work on the list currently stands at **£84,957m**.

9.5 Other Schemes

This category comprises schemes that are not funded from the Council's capital programme, but from other sources such as government grants, or damages paid after an incident. There are currently no schemes funded by grant money.

9.6 Third Party Schemes

Third party schemes are works on Council bridges carried out by others such as wind farm developers or the Strategic Timber Transport Scheme (STTS). 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 to the standard required for public roads.

10 Structural Assessments

- 10.1 A structural assessment is a theoretical calculation of the load carrying capacity of a structure. Assessments are required when a structure is suspected to be sub-standard, and the outcome will influence decisions on 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 needs' 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.
- 10.2 The capital programme includes some assessment work. 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 capital budget allocation.

Designation: Assistant Chief Executive - Place

Date: 14 October 2024

Author: Andrew Tryon, Principal Engineer (Structures)

Background Papers: Cattle and Deer Grids [Policy](#)
Bridges and Road Structures [Report](#)
EDI 23/17 Road Structure Annual [Report](#)
EDI 81/18 Road Structures Annual [Report](#)
EDI 083/19 Road Structures Annual [Report](#)
ECI 38/20 Road Structures Annual [Report](#)
ECI 53/2021 Road Structures Annual [Report](#)
ECI 33/22 Road Structures Annual [Report](#)
ECI 63/2023 Road Structures Annual [Report](#)
Strategic Timber Transport Scheme 2020/21 [Report](#)
Capital Programme Review – General Fund [Report](#)

Appendices: Appendix 1 – Small and medium schemes
Appendix 2 – Major bridges priority list
Appendix 3 – Descriptions for selected major bridge schemes

Appendix 1 – Small and Medium Schemes

1.1 Priority List for Small and Medium Schemes

The following table shows the top priority small and medium schemes, together with an indication of affordability within the next five years. The affordability is based on an assumed level of funding that is commensurate with recent years (actual funding has not yet been agreed). The prioritisation is indicative, and the actual order in which projects are progressed is decided based upon engineering considerations and resource availability.

1.1 Small and medium schemes priority list								
2	Bridge Code	Bridge Name	2020 Op Areas	Ps ¹	Index	Cumulative Total (£k)	Est £k	Scope of Work
*	C11500020	BRACORA	Lochaber	65.7	1	85	85	Minor bridge deck replacement
	A08320330	POOLEWE	Ross and Cromarty	64.6	2	335	250	Concrete investigation and repair
*	U10440010	AULTVOULIN	Lochaber	63.8	3	485	150	Deck replacement
*	B08170051	AVERON FOOTBRIDGE	Ross and Cromarty	61.7	4	885	400	Assessment then Repair or Replacement
*	C11500010	LOIN	Lochaber	59.3	5	970	85	Minor bridge deck replacement
	B91540010	MOY	Inverness	56.4	6	1,120	150	concrete investigation and repair, assessment
	C10940090	SCHOOL	Lochaber	55.8	7	1,420	300	Replacement
*	B80570050	FIREMORE	Ross and Cromarty	55.7	8	1,835	415	Minor bridge deck replacement
Indicative 5-year affordability line								
(assuming £650k in Year 1 and £350k per year for Years 2 to 5)								
	U19900010	LEALTY	Ross and Cromarty	53.6	9	2,165	330	Repair and possible widening
	U19070010	DUBLIN	Ross and Cromarty	52.8	10	2,205	40	Tie bar repairs
	A08320270	GRUDIE	Ross and Cromarty	50.8	11	2,455	250	Concrete repairs
*	A08960110	BALGY	Ross and Cromarty	49.7	12	2,522	67	Assessment of structure including half-joints
	B90070040C93	AIRDRIE MILL BURN	Nairn and Cawdor	47.4	13	2,722	200	Repairs
	A08610230	RIVER GOUR	Lochaber	46.5	14	2,969	247	Repaint, waterproof, resurface, parapet replacement
*	C11190010	BALNAAN	Badenoch and Strathspey	45.9	15	3,036	67	Assessment of structure including half-joints
	U28230010	LOWER FOYERS BAILEY	Inverness	45.7	16	3,186	150	Redecking of bailey bridge
	B91610010	LITTLEMILL	Ross and Cromarty	45.2	17	3,226	40	Tie bar repairs

1.1 Small and medium schemes priority list

2

Bridge Code	Bridge Name	2020 Op Areas	Ps ¹	Index	Cumulative Total (£k)	Est £k	Scope of Work
A08350250	KNOCKAN	Sutherland	45	18	3,576	350	Parapet replacement, concrete investigation
U49480020	BRAEINTRA	Ross and Cromarty	44.9	19	3,616	40	Tie bar repairs
A08390010	PITTENTRAIL	Sutherland	43.9	20	3,741	125	Refurbishment
A08350270	LEDMORE	Sutherland	42.7	21	4,016	275	Parapet replacement, concrete investigation
A08320090	GRUDIE	Ross and Cromarty	41.6	22	4,216	200	Investigation to determine scope of repairs
B91780010	DULNAIN	Badenoch and Strathspey	41.6	23	4,516	300	Repair of cantilever
C12230010	OLD SHIEL	Ross and Cromarty	41.2	24	4,816	300	Refurbishment
A08620090	LOVAT	Inverness	40.8	25	5,021	205	Masonry repair and scour protection
U48090010	CHRACAIG	Eilean a' Chèò	40.8	26	5,421	400	Repair and refurbish
B90900020	HOWFORD	Nairn and Cawdor	38.4	27	5,621	200	Steelwork repairs and repaint
U14230010	ALLT CURRACHAN	Inverness	38.3	28	5,936	315	Investigate options for repair/replacement
C10870030	AN UILLT BHIG	Ross and Cromarty	38	29	6,296	360	Strengthening and refurbishment
U32670010	ACHVAICH	Sutherland	37.7	30	6,527	231	Replace structure. Options study.
A08380220	KYLE OF TONGUE	Sutherland	36.2	31	6,607	80	Movement joint replacement
A08550010	RIVER LEASGEARY	Eilean a' Chèò	35.4	32	7,017	410	Strengthen edge, replace parapet, refurbishment
A08380080	ACHFARY	Sutherland	35.2	33	7,567	550	Waterproofing and resurfacing, concrete repairs
B09700200	NETHY	Badenoch and Strathspey	33.4	34	7,707	140	Repointing
A08610350	CEOL NA MARA	Lochaber	31	35	7,767	60	Masonry repairs
A08630140	CAROY	Eilean a' Chèò	30.5	36	7,867	100	Waterproofing and resurfacing, parapet replacement
A08610340	CAMUSCHORK	Lochaber	30	37	7,927	60	Masonry repairs
U21040030	SHERRAMORE	Badenoch and Strathspey	29.2	38	8,127	200	waterproofing / Joints / vegetation
A08610140	CLADACH	Lochaber		39	8,527	400	Propped bridge. Probable replacement

Notes

¹The priority score is out of 100 with higher scores being worse.

²Lines above marked thus “*” and highlighted yellow indicate projects from this list that are currently in progress.

1.2 Small and Medium Schemes NOT on the Priority List

The following table lists bridge schemes that are currently in progress against the bridges, walls and culverts budget, but not included in the priority schemes listed in Appendix 1.1. For each scheme, justification is given below for why it is being progressed ahead of the prioritised list.

1.2 Small and medium bridge schemes not on Priority List					
Bridge Code	Bridge / Scheme Name	2020 Op Areas	Est £k	Scope of Work	Justification for Progressing Scheme ahead of Normal Prioritisation
C1153****	LOCH ARKAIG CULVERTS	Lochaber	240	Minor bridge deck replacement	Progressed to enable timber extraction and to leverage external STTS funding in 2023/24.
B91760090	STRUJIE HIGH BRIDGE	Sutherland	80	Bridge parapet repairs and road safety improvements (works completed May 2024, retention held until May 2025).	Progressed to enable leverage of external road safety funding.
U22390040	DALNAHEITNACH	Badenoch and Strathspey	30	Replacement of bridge as part of re-naturalisation of landscape	Budget to cover design work with construction being funded by Cairngorm National Park.

The amounts above are not scheme totals, but are the amount expected to be funded from bridges, walls and culverts budget.

Appendix 2 – Major Bridges Priority List

Major Bridges List							
Bridge Code	Bridge Name	Area	Priority Score ¹	Index	Estimated Cost (£k)	Cumulative Total (£k)	Scope of Work
<u>NAMED PROJECTS</u>							
B08630010	INVERCOE	Lochaber	-	-	120	120	Job complete - retention fee payable 2024
A08360290	NAVER	Sutherland	62.1	1	11,500	11,620	Bridge replacement (design complete and ready to tender)
F00000020	INFIRMARY	Inverness	62.6	2	550	12,170	Essential repairs, plus feasibility report into future of crossing
<u>PROJECTS TO BE CONSTRUCTED UNDER GENERIC MAJOR BRIDGE LINE</u>							
A083100XX	A831 Bridges	Inverness	43.7	3	1,300	13,470	2 No. deck replacements and 2no. deck repairs.
U51640010	WHITEBRIDGE	Nairn and Cawdor	27.8	4	233	13,703	Repairs to old structure (agreed as part of Whitebridge replacement)
<u>FEASABILITY REPORTS TO BE STARTED UNDER GENERIC MAJOR BRIDGE LINE</u>							
B08610010	NESS	Inverness	65.7	5	1,800	15,503	Further assessment, half joint capacity mitigation, repairs and re-waterproofing
A08900080	STRATHCARRON	Ross and Cromarty	64.1	6	1,200	16,703	Major refurbishment (possible replacement)
B08630060	KINLOCHLEVEN VIADUCT	Lochaber	61.2	7	2,518	19,221	Assessment, feasibility study and refurbishment
C11520020	SPEY BRIDGE CROMDALE	Badenoch and Strathspey	60.5	8	2,175	21,396	Assessment and Refurbishment
A08360090	BONAR	Sutherland	58.9	9	1,425	22,821	Refurbishment
5-year Affordability Line							
(Schemes above this Line ARE currently funded. Schemes below this line ARE NOT currently funded)							
<u>OTHER SCHEMES AWAITING FUNDING</u>							
U24000020	SLOCHD COTTAGES RAILWAY	Badenoch and Strathspey	58.8	10	1,000	23,821	Currently closed due to failed assessment. Work required to remove excess fill and then repurpose as foot/cycle bridge.
C11060010	BLACK BRIDGE KILMORACK	Inverness	57.7	11	13,000	36,821	Recent assessment shows bridge is substandard. Replacement required.

Major Bridges List							
Bridge Code	Bridge Name	Area	Priority Score ¹	Index	Estimated Cost (£k)	Cumulative Total (£k)	Scope of Work
A088400XX	A884 BRIDGES	Lochaber	57.7	12	2,750	39,571	Replacement of three bridges (Creiche, Cloiche and Easgadill) on the A884
A08360260	BORGIE	Sutherland	54.1	13	750	40,321	Refurbishment
B80070070	GLENMORE	Lochaber	51.2	14	1,853	42,174	Replacement
C11540030	DULSIE	Nairn and Cawdor	50.3	15	459	42,633	Refurbishment
U46200010	WATERLOO	Inverness	49.7	16	2,600	45,233	Steelwork repairs and repaint
A08380010	TIRRY	Sutherland	49.7	17	4,764	49,997	Replacement
B91590010	WICK HARBOUR	Caithness	47.2	18	10,428	60,425	Replacement
C11080050	MAULD	Inverness	46.8	19	7,500	67,925	Replacement
A08310100	COMAR	Inverness	45.9	20	832	68,757	Refurbishment
A08840090	ACHNAGAVIN	Lochaber	44.4	21	900	69,657	Refurbishment
A08320060	MOY	Ross and Cromarty	44.4	22	12,000	81,657	Replacement
A08940030	KYLESKU	Sutherland	44.3	23	2,400	84,057	Refurbishment
A08840080	ACHARN	Lochaber	37.8	24	900	84,957	Refurbishment

¹The priority score is out of 100 with higher scores being worse.

Appendix 3 – Descriptions for selected major bridge schemes

Ness Bridge Remediation

Structure Name	Ness Bridge	Structure Number	B08610010
Location	B861 Young Street, Inverness	Priority Score	65.7
Area	Inverness	Priority Index	5
Description	77m long three-span post tensioned concrete bridge with half-joints		

Existing Risk

Ness Bridge is a high priority because it features post-tensioning and half-joints which are features at risk of hidden deterioration and sudden collapse. As such the bridge requires careful management. A special investigation and assessment in 2023 and 2024 revealed concerns with the half-joints which require addressing. Further funding is now required to carry out further investigation and develop repairs for the bridge.



Potential Consequences

Half-joints, which are present on Ness Bridge carry a small risk of sudden failure. It is therefore critical to safety that appropriate solutions are implemented to ensure the continued safe operation of the bridge. Work is ongoing to determine the solutions.

Proposed Scheme

Following the investigation, further assessment and investigation are required to determine required extent of remediation works. A remediation contract will likely follow which is expected to include concrete repairs and re-waterproofing the deck. So far, investigation work has been funded from the “Bridges, Walls and Culverts” line for minor to medium works. Now that the amount of work required is growing, further funding is required.

Proposed Scheme Cost (£k)

£1,800k



Photos: Ness Bridge (top), crack under the half-joint (bottom left), special investigation, 2023 (bottom right).

Strathcarron Bridge Repairs

Structure Name	Strathcarron	Structure Number	A08900080
Location	A89, near Strathcarron Station	Priority Score	64.1
Area	Ross and Cromarty	Priority Index	6
Description	60m long 5 span concrete bridge		

Existing Risk

There is significant cracking and spalling to the underside of the bridge deck, including to previously repaired concrete. High potential for requiring a weight restriction in the near future.

Potential Consequences

Closure or weight restriction would result in severe disruption to travel along the west coast, including the NC500 route. The diversion route is 140 miles via Drumnadrochit. This would cause significant disruption to local communities, not dissimilar to when rockfalls close the A890 further south.

Proposed Scheme

Extensive concrete repairs to soffit and piers. Install cathodic protection to prevent further corrosion to reinforcement. Structural assessment and concrete testing to determine extent of repairs.

Proposed Scheme Cost (£k)

£1,200k



Spey Bridge Cromdale Repairs and Repainting

Structure Name	Spey Bridge Cromdale	Structure Number	C11520020
Location	About 5km downstream from Grantown on Spey	Priority Score	60.5
Area	Badenoch and Strathspey	Priority Index	8
Description	60m metre long, 2 span steel truss bridge		

Existing Risk

The bridge has severe corrosion to the underside of the deck and widespread breakdown of the paint system. The corrosion is so severe that there are holes in some elements. One abutment is badly damaged and the bridge is currently propped at one end. A 7.5tonne weight restriction is in place.



Potential Consequences

It is likely that in the near future we will need to further restrict or close the bridge. The bridge is on the Speyside Way; therefore any closure will impact tourism, and active travel as well as the local communities and businesses.

Proposed Scheme

Carry out a structural assessment to determine the extent of repairs and if the prop can be removed. Repair south abutment, pier, steelwork. Install new bearings. Blast clean and repaint the whole structure.

Proposed Scheme Cost (£k)

£2,175k



Kinlochleven Viaduct Repairs

Structure Name	Kinlochleven Viaduct	Structure Number	B8630060
Location	B863, Kinlochleven	Priority Score	61.2
Area	Sutherland	Priority Index	7
Description	93m long, 10 span concrete viaduct. Grade A listed.		

Existing Risk

The concrete on both the columns and bridge deck is in a poor condition. There is widespread cracking and spalling, with exposed and corroding reinforcement bars. Some parts of the area under the bridge are cordoned off due to the risk of falling concrete.

Potential Consequences

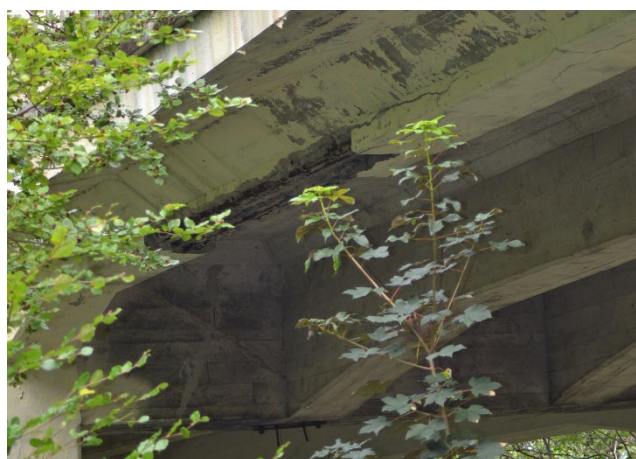
Closure or weight restriction would result in disruption to the community of Kinlochleven. The south shore road is the main route in, although longer, narrower route exists on the north shore.

Proposed Scheme

Carry out structural assessment, concrete testing and feasibility study to examine options for the bridge. Assumed option at the moment is to carry out a full refurbishment of the bridge.

Proposed Scheme Cost (£k)

£2,518k



Bonar Bridge Repainting

Structure Name	Bonar Bridge	Structure Number	A08360090
Location	A836, Bonar Bridge	Priority Score	58.9
Area	Sutherland	Priority Index	9
Description	104m span, steel arch bridge		

Existing Risk

Bonar Bridge had a paint inspection carried out in 2016, which stated that the paint system had largely failed and should be replaced within 5 years. The form of the structure is prone to sudden collapse if not adequately maintained. The structure is not currently a high risk for closure or restriction, this scheme is required to prevent a much larger repair bill in the future.



Potential Consequences

Bonar Bridge has a high strategic function on the Sutherland road network. It is one of only two bridges connecting East Sutherland and Caithness to the south. The other (A9 Dornoch Bridge) can be closed due to high winds. The form of the structure is prone to sudden collapse if not adequately maintained. This is one of our largest bridges, and therefore the cost of replacement will be very high (est. £30m).

Proposed Scheme

Blast clean and repaint the entire structure. Minor repair works where required. Improve drainage around bearings. Remove redundant and unsafe access gantry.

Proposed Scheme Cost (£k)

£1,425k



A884 Creiche to Easgadil Bridges

Structure Names	Creiche, Cloiche and Easgadil Bridges	Structure Number	A08840020 to 40
Location	A884 Carnoch to Lochaline Road, Loch Sunart	Priority Score	Between 43 & 59.1
Area	Lochaber	Priority Index	12
Description	Three reinforced concrete bridges between 3.3m and 11.40m span		

Existing Risk

Three bridges on the A884 on the south shore of Loch Sunart with concrete deck defects including cracking and spalling. Two of the bridges, Creiche and Cloiche, failed assessment in 1992 but are not subject to weight restriction. This means the bridges are potentially carrying loads in excess of their capacity and are therefore operating with a reduced factor of safety.

Potential Consequences

If the previous assessment result is correct, then the bridges are operating at a reduced factor of safety and there is increased risk of collapse. Closure or weight restriction would cause disruption on the road to Lochaline.

Proposed Scheme

As a minimum, reassessment is required. Re-assess Creiche and Cloiche bridges to determine whether replacement is required. Following re-assessment carry out a scheme to either repair the structures or replace them.

Proposed Scheme Cost (£k)

£2,175k (assuming replacement of all three bridges).



Borgie Bridge Repairs

Structure Name	Borgie	Structure Number	A08360260
Location	A836 between Bettyhill and Tongue (NC 500)	Priority Score	54.1
Area	Sutherland	Priority Index	13
Description	42.5 m long, 5 span concrete structure, with masonry cladding.		

Existing Risk

The concrete bridge deck is in a poor condition with exposed and corroding reinforcement bars visible on the underside. Potential for continued deterioration leading to reduced capacity (and therefore weight restriction or closure).

Potential Consequences

Closure or weight restriction would result in severe disruption to travel along the north coast, including the NC500 route. The diversion route is 60 miles via Kinbrace. The communities affected would include the north coast from Tongue to Durness (to the west) and the north coast from Melvich to Thurso and Wick (to the east).

Proposed Scheme

Concrete investigation and testing to determine extent of repairs. Works contract for concrete repairs and installation of cathodic protection (to prevent further corrosion of rebar).

Proposed Scheme Cost (£k)

£750, depending upon extent of repairs required.



Glenmore Bridge Replacement

Structure Name	Glenmore	Structure Number	B80070070
Location	B8007, 2 miles west of Glenborrodale	Priority Score	51.2
Area	Lochaber	Priority Index	14
Description	9.5m long 2 span, reinforced concrete slabs		

Existing Risk

Glenmore bridge dates from circa 1950. As is common for bridges of this era, the reinforced concrete was constructed to lower standards than today and is now in poor condition. The bridge was assessed in 1996 as capable of carrying only 7.5 tonnes (full loading is 40 tonnes). No weight restriction was imposed on the bridge because it is a lifeline route providing the only road to Ardnamurchan and Kilchoan. As such the bridge is operating with a reduced factor of safety. This increases the risk that the structure might need to be closed or restricted if further deterioration occurs.



Potential Consequences

Glenmore is a lifeline bridge with no alternative diversion route. A weight restriction would be disruptive, and a bridge closure would cut off access to Ardnamurchan peninsula, including Kilchoan.

Proposed Scheme

Replacement with a new single span structure to avoid the need for a pier in the river. The lack of alternative route increases the priority of this project. An offline diversion would be required to ensure the road remains open. Some initial survey and design work has been undertaken but detailed design and land negotiations are not done.

Proposed Scheme Cost (£k)

£1,853k



Waterloo Bridge Repairs

Structure Name	Waterloo	Structure Number	U46200010
Location	U4620 Grant Street at River Ness, Inverness	Priority Score	49.7
Area	Inverness	Priority Index	16
Description	109m long 5-span half-through truss, assumed to be steel		

Existing Risk

Waterloo bridge was constructed circa 1896 and is presently in poor condition due to paintwork failure and subsequent corrosion of steelwork. The bridge is substandard and has a 7.5t weight limit (except for some buses). Whilst the bridge is old, it is considered to be repairable by repainting and steelwork repair methods such as replacement and over-plating of members. The bridge is thought to be steel but might comprise wrought iron. Further testing and investigation would be required to confirm the materials.



Potential Consequences

Lack of repainting will allow corrosion of the steel to continue which will ultimately lead to further weight restriction or closure. This would cause traffic disruption in central Inverness. The bridge is also important because it carries services over the River Ness.

Proposed Scheme

Carry out a major maintenance scheme to extend the life of the structure. The scheme would comprise scaffolding, temporary encapsulation (to prevent pollution from paint removal), repainting, resurfacing and steelwork repairs. No preparatory work has yet been carried out; this would be a new scheme. The temporary scaffolding and encapsulation would be a significant part of the cost.

Proposed Scheme Cost (£k)

£2,600k

