The Highland Council

Community Services Committee
05 November 2015

Agenda Item	11
Report No	COM 58/15

Bridges and Road Structures

Report by Director of Community Services

Summary

This report provides an outline of the Council's bridge stock, its condition, the bridge inspection regime, and how bridges are prioritised for Capital investment.

It provides recommendations for projects to be included in the "*Structural Road Works - Bridges, Retaining Walls & Culverts*" line, of the Community Services Capital Programme, 2016/17.

1. Nature of the Council's Bridge Stock

1.1 Although referred to here, generally, as "bridges", the Council's stock of road structures also includes retaining walls and culverts.

1.2 Of the 32 Scottish local roads authorities, The Highland Council has the largest number of road structures.

1.3 The Council's roads are carried by approximately 2200 bridges and culverts. These roads also rely on over 1000 retaining walls, of which around 800 support the road. The gross replacement value of these structures is more than £650million.

1.4 The following table summarises numbers of road structures, by size, by Council Area, and by proportion of their replacement value.

			Proportion of totals by Council Area			
Totals of road structures	**by Number**	**%age Renewal Cost**	**C & S**	**R,C & S**	**L,N, B & S**	**Inv.**
Bridges / Culverts 5m or greater	825	50%	6%	7%	7%	5%
Bridges / Culverts 3m to 5m	696	10%	7%	6%	5%	2%
Bridges / Culverts 1.5m to 3m	690	5%	7%	7%	5%	3%
Retaining Walls - support the road	820	30%	6%	9%	6%	3%
Retaining Walls - above the road	269	5%	2%	3%	2%	2%
	3300		**28%**	**32%**	**25%**	**15%**

2. Inspections

2.1 In common with all infrastructure, bridges have a limited life; their repair and renewal become necessary due to wear and tear, damage, and so on. And in the case of many older bridges, they are structurally weak, having not been designed to be able to cope with the volume and weights of modern traffic.

2.2 A regime of inspection, and condition monitoring is essential, to ensure safety and reliability of our bridge stock. Recommendations for inspection are given in nationally published Standards (BD63 and IAN171) and in the Code of Practice for Management of Highway Structures (currently under review, and to be republished in the coming months).

2.3 The Code of Practice recommends that bridge General Inspections be carried out every two years, and more detailed Principal Inspections every six years.

2.4 Due to limited resources being available the Council operates a less frequent regime (begun in 2008) of :

- General Inspections at three-year intervals;
- Principal Inspections at nine-year intervals;
- Principal Inspections are undertaken only on bridges of 5 metres overall length, and greater; and on Council-owned railway crossings;
- Only a very limited number of retaining walls are inspected.

2.5 General Inspections are undertaken by local-office staff in Community Services.

2.6 Principal Inspections are undertaken by engineering staff in the Structures Section of Development & Infrastructure.

2.7 An important output from each Principal Inspection is a detailed report on bridge condition, with a record of defects, recommendations for repair and maintenance, and estimated costs of the recommended work.

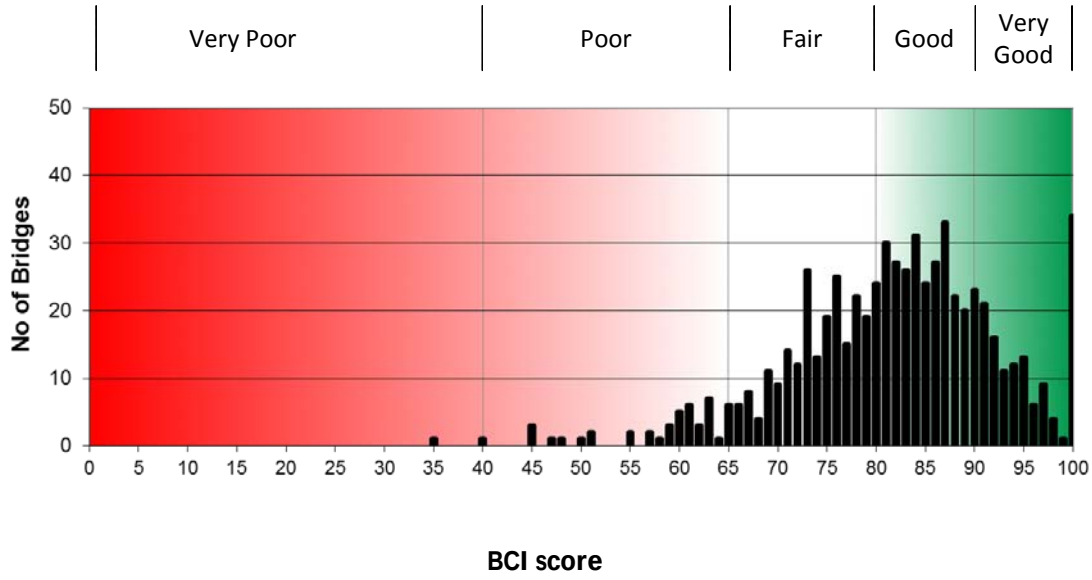
2.8 Recommendations could also include (and indeed, have included) increased levels of monitoring, weight restrictions or even bridge/road closures.

2.9 Condition is summarised for each structure, using a nationally published method to produce a Bridge Condition Indicator (BCI) score. And for the Council's stock of bridges, these individual scores can be combined to produce a Bridge Stock Condition Indicator (BSCI). Thereby, general trends in deterioration or improvement of the bridge stock, or sub-stocks, may be expressed.

3. Bridge Stock Condition

3.1 The current Bridge Stock Condition Indicator value is 82.0. This places the stock in the "Good" category overall. The distribution of values for each bridge, is shown in the following diagram. (Note that these are for only the bridges

which receive Principal Inspections).



3.2 Note that 39 of the bridges are in “Poor” condition, and that one is in “Very Poor” condition. **Appendix 1** lists these bridges.

3.3 Bridge condition is taken into account in prioritisation of Capital investment.

4. Load Carrying Capacity of Bridges

4.1 Knowledge and establishment of the safe load carrying capacity of our bridges is critical to their effective management. This is particularly so in the context of the many abnormal load movements that take place or are notified each year, associated with major harbours, wind farm developments, hydro-electric developments, transmission line upgrades and the like.

4.2 Even for normal use of a route, many older structures are weak, having not been designed to be able to cope with the volume and weights of modern traffic.

4.3 Load carrying capacity is taken into account in prioritisation of Capital investment.

5. Prioritisation of Capital Investment in Bridges

5.1 When a need for Capital investment has been identified, to replace, strengthen or repair a bridge, the investment has to be prioritised. There are always greater needs than there are resources to deal with them.

5.2 Factors taken into account in that prioritisation, include (in no particular order):

- Load carrying capacity,
- Likelihood and consequence of structural failure,
- Condition,
- Parapet resilience,
- Road alignment,
- Traffic flows,
- Whether on a public transport route,
- Whether on the sole route into a community,
- Economic impact,
- Cost of proposed works, and
- Heritage / Listed status.

5.3 The bulk of Capital expenditure on renewal and replacement, comes from the "Major Bridges" and the "Lifeline Bridges" elements of the Development & Infrastructure Service programme. The current programme was approved by D&I Committee on 03 June, 2015.

6. Capital Investment Proposals : Structural Road Works - Bridges, Retaining Walls & Culverts

6.1 £350k per annum, is the current level of investment in "*Structural Road Works - Bridges, Retaining Walls & Culverts*", in the Community Services Capital Programme.

6.2 This can fund work items such as :

- Waterproofing and surfacing of bridge decks,
- Movement joint replacement,
- Masonry repointing,
- Parapet replacement,
- Repainting, and
- Scour protection

6.3 Works recommended for approval by Members, for year 2016/17, are –

Bridge Ref. & Name		**Area / Ward**	**Brief Description**	**Estimated Cost (£,000s)**
A08310160	**Struy**	Inverness /13	Masonry repairs, scour protection	100
A08380080	**Achfary**	C&S /1	Re-waterproofing , resurfacing, concrete repairs	90
A08620120	**Blackburn**	R,C&S /9	Movement joint replacement	30
C11260030	**Coronation**	L,N,B&S /21	Repainting steel beams, re-waterproofing and resurfacing	130
				350

7. Implications

7.1 Many bridges are in rural locations and part of lifeline roads. The prioritisation factors described in 5.2 include that fact and also the economic impact of any restriction in capacity or failure.

7.2 The need for maintenance works outstrips the available funding mentioned in 6.1. While this report does not explicitly seek additional funding it does describe the needs based process used to recommend a future programme of work. This process along with the inspection regime helps to reduce the risk that a structure fails.

7.3 There are no legal, equalities, climate change/Carbon Clever, risk, or Gaelic implications arising as a direct result of this report.

Recommendations

i. Members are asked to note the current regime of bridge inspections, the condition of the bridges stock, and the factors taken into account in making recommendations for prioritising investment.

ii. Members are asked to approve the proposed works for year 2016/17, to be funded from the "*Structural Road Works - Bridges, Retaining Walls & Culverts*" line of the Council's Capital Programme.

Designation:	Director of Community Services
Date:	26 October 2015
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Background Papers:	Minute of Development & Infrastructure Committee, 03 June 2015

APPENDIX 1

BRIDGES IN "POOR" CONDITION

Bridge Code	Bridge Name	Overall Length Of Structure	Date Of Last PI	Average BCI Value	Ward Number
C10340060	ALLTNACAILLICH	12.6	06-Jul-15	60.3	1
A08370010	INVERAN	41.15	16-Aug-13	61	1
B08690090	TORGAWN	7.6	19-Jun-13	61.5	1
C11400030	ALLT A GHLINNE	6.8	19-Aug-15	62.7	1
B91590010	WICK HARBOUR	60.4	10-Jun-14	59	3
C10220040	BALNACOIL	64	26-Jun-08	61.5	5
C11480020	OLD HELMSDALE	43.2	10-Jun-14	62.7	5
C10750010	ACHGARVE	7	20-Aug-10	40.4	6
U49480020	BRAEINTRA	5.4	29-Nov-12	55.3	6
A08900110	ACHNASHELLACH	6.3	20-Aug-14	57.4	6
A08320330	POOLEWE	19	13-Jun-14	58.9	6
U49340010	LETHALT	12.3	28-Feb-12	63	6
A08620130	MUIR OF ORD RAILWAY	28.65	23-Apr-14	45.2	9
B80830020	ALLT AIRIDH	5.2	12-Mar-08	51.1	11
B08840030	HAMARA	10.1	23-Oct-07	59.6	11
C11440120	MHEIL	7.1	17-Aug-15	61.7	12
C11000010	OLD MONIACK	12.2	15-Nov-12	45.3	13
A08310110	CANNICH	40.8	13-Oct-14	60.5	13
U15680010	REELIG	10	18-Aug-11	60.7	13
C11080050	MAULD	54	24-Sep-12	61.7	13
U11770010	LOWER FOYERS	36.7	14-Jan-14	63	13
C11080010	BRUIACH	8	15-Nov-12	63.8	13
U17500020	CORRIMONY	9.75	13-Oct-14	63.9	13
A08310100	COMAR	34.42	19-Jun-08	64	13
C11540030	DULSIE	56	28-Aug-13	63.7	19
U21040010	SPEY DAM	36.2	20-Aug-15	58.9	21
B91780010	DULNAIN	20	12-Aug-10	59.7	21
C11190010	BALNAAN	46	04-Jun-14	60.2	21
A08610440	ROSHVEN	10.2	17-Jun-08	45.9	22
C10940090	SCHOOL	7.2	03-Sep-15	47.8	22
C10940010	COUPALL	10.35	17-Aug-15	50.7	22
C10940080	INVERCHARNAN	6.3	03-Sep-15	51.2	22
C10940070	INBHIR FHAOLAIN	5.15	03-Sep-15	55.9	22
B08630010	INVERCOE	56.22	12-Mar-14	57	22
A08610230	RIVER GOUR	21.9	16-Jun-08	60	22
B08630060	KINLOCHLEVEN VIADUCT	93	31-Aug-07	60.6	22
A08610450	ALISARY	9.1	17-Jun-08	61.7	22
A08840080	ACHARN	18	13-Aug-13	62	22
C10940040	DALNESS	5.3	03-Sep-15	63.8	22

BRIDGE IN "VERY POOR" CONDITION

Bridge Code	Bridge Name	Overall Length Of Structure	Date Of Last PI	Average BCI Value	Ward Number
B80070070	GLENMORE	9.5	31-Aug-11	35.9	22