



**Highway Asset
Annual Status Report
Structures, 2023**

Summary

This report presents the status of the council's structure in terms of condition and investment as of March 2024. The report states:

Investment

- Funds are committed to the 10-year Maintenance Plan for Flintshire Bridge approved in 2021/22.
- The routine budget of £31k in 2023/24 is approximately 20% of the estimated need.
- The average investment in planned maintenance between 2014/13 and 2023/24 is £171k pa. This is less than 1/3rd of the estimated annual depreciation (the average amount required over time to keep the asset in service)

Works

- 24 structures (out of a stock of 390) received works funded by capital investment in 2023/24

Condition

- Condition (inspection results): 7 are currently rated to be in a very poor condition and a further 45 in a poor condition.
- Scour: it is unknown currently if there are structures that are susceptible to scour that may benefit from protection works
- Strengthening: it is unknown if there are structures that are inherently weak on the network.

Backlog

- The estimated cost of repairing all the defects in the structures "workbank" is £2m.
- The estimated cost of refurbishment of structures in a "very poor" or "poor" condition is £655k

Risk

- **The risk of a bridge being damaged by Scour is unknown.** An investigation of this is planned. It may be necessary to update the HAMP if a need for scour protection works is identified.
- **The risk of a bridge being inherently weak is unknown.** An investigation of this is planned. It may be necessary to update the HAMP if the investigation identifies structures that need strengthening.

1. Purpose

This report provides managers and elected members with information to enable standards to be set and included in the Highway Asset Management Plan (HAMP) for highway structures

2. Scope

Status

The report describes the status of the council's highway structures in terms of condition and investment as of March 2024.

3. The Asset

Scale

The council manages 390 Highway Structures, ranging from busy road bridges to small culverts

Structure Type	Number
Road Bridges	73
Footbridges	142
Retaining Walls	25
Culverts	149
Subways	1
Total	390

The Flintshire Bridge is a cable-stayed bridge which has its own specific maintenance plan. The bridge is managed in accordance with a 10 year maintenance plan with the budget approved in 2021/22.

Value

In 2015 the total replacement value (gross replacement cost, GRC) of the highway structures asset was estimated at £238m.

4. Condition

Condition of Stock

Structures condition is reported using a bridge stock condition indicator (BSCI). The figures reported are at a stock level i.e. the average for all structures and are:

- BSCI_{ave}: the average condition of the stock based upon the rating given to all components of the structures and
- BSCI_{crit}: the condition based upon ratings of components of structures that are considered critical to the load carrying capacity of the structure i.e. "critical components" only.

Currently $BSCI_{ave}$ and $BSCI_{crit}$ are not available. The following tables show the quantities of individual structures in each of the BCI Condition Ranges for both $BSCI_{ave}$ and $BSCI_{crit}$.

$BSCI_{ave}$ Results as of 31 March 2024						
Type	Quantity	BCI Condition Range				
		Very Good	Good	Fair	Poor	Very Poor
Road Bridges	73	22	34	17	0	0
Footbridges	142	57	61	24	0	0
Retaining Walls	25	25	0	0	0	0
Culvert	149	55	78	16	0	0
Subway	1	0	1	0	0	0
Totals	390	159	174	57	0	0

$BSCI_{crit}$ Results as of 31 March 2024						
Type	Quantity	BCI Condition Range				
		Very Good	Good	Fair	Poor	Very Poor
Road Bridges	73	29	0	33	10	1
Footbridges	142	46	1	77	15	3
Retaining Walls	25	25	0	0	0	0
Culvert	149	74	0	52	20	3
Subway	1	1	0	0	0	0
Totals	390	175	1	162	45	7

Historical condition information is not currently available so it is not possible to comment on whether the structures stock is improving or deteriorating.

General Inspections are completed on each structure every 2 years. 104 structures require a Principal Inspections which are completed every 6 years.

Strengthening Need

A structure in need of strengthening has typically had a structural assessment completed on it and been identified as being weak. Management of these structures can include monitoring, the use of weight or other use restrictions. It is unknown if assessments have been carried out. A plan to investigate the need for strengthening is appropriate and will enable the risk of structural failure to be better understood and managed.

Refurbishment Need

Stock level indicators are based on figures that include the numbers of structures in a very poor or poor condition. Structures deteriorate slowly over time. Timely routine maintenance can greatly assist to ensure that structures require the minimal amount of the more expensive major refurbishment works but there will come a time in most structures lives when refurbishment is required. Refurbishment usually includes works to several components and will restore it to a good condition.

Structures in Very Poor Condition (based on their BCI_{crit} values)

Structures with a BCI_{crit} value of less than 40 are deemed to be in a very poor condition.

➤ **7 structures are in a “very poor” condition (including 1 road bridges)**

Structures in a Poor Condition

In addition to the very poor condition structures a further 45 structures are deemed to be in a poor condition with BCI_{crit} values between 40 and 65.

➤ **45 structures are in a “poor” condition (including 10 road bridges)**

Parapet Upgrading

Parapets provide protection for users to limit the risk of falling from the structures (as a pedestrian or more likely in a vehicle). The parapets on many structures do not meet modern design standards. The risk associated with these parapets is a function of their use, some pose a higher risk than others. There are currently no records available which indicate any of the structures require parapet upgrading.

Scour Protection

it is unknown currently if there are structures that are susceptible to scour that may benefit from protection works. An investigation of this is planned. It may be necessary to update the HAMP if a need for scour protection works is identified

Flintshire Bridge

The Flintshire Bridge is a cable-stayed bridge spanning the Dee Estuary in Flintshire. A 10-year maintenance plan was approved in 2021/22 to ensure the bridge remains in good condition. The cost of the plan is £1.8m over the 10 years. The annual costs vary depending on the programmed inspections or works.

Reactive Maintenance Needs

In addition to the specific deficiencies noted above there is an ongoing need to carry out reactive maintenance, for example where vehicle impact requires repair and routine maintenance. Reactive maintenance needs are unpredictable. They are best predicted by reference to historical costs.

- **Historically reactive maintenance needs have been met from a budget of c£16k**

Routine Maintenance Needs

Routine maintenance works are “good housekeeping”, work is small in scale and cost but necessary to prevent more costly repairs being required in the future. Typical works include vegetation removal, drainage cleansing, minor repointing, minor concrete repairs etc. CSSWales* has created an initial model that has been developed to estimate a range of budget levels appropriate for routine maintenance needs. Applying this method of estimating to Flintshire’s stock gives an indicative routine maintenance budget need range of £135k to £180k pa.

- **Estimated Total Routine Maintenance needs is in the range of £135k to £180k pa**

(*CSSW = County Surveyors Society of Wales representing the 22 Welsh highway authorities. Under their ongoing national highway asset management project CSSW has created estimating methods for forecasting a broad assessment of routine maintenance needs for structures)

Backlog

Major Refurbishment

7 structures are in a “very poor” condition. The initial estimated cost of refurbishment of these structures is £80.0k.

A further 45 structures are in a “poor” condition. The initial estimated cost of refurbishment of these structures is £575k.

Structures Maintenance Backlog

A structures maintenance backlog has been defined as the cost of addressing identified strengthening# works plus the cost of addressing the refurbishment of structures in a very poor or poor condition

- **Current Structures Maintenance Backlog = £655k**

Workbank

When structures are inspected the bridge inspector records a budget estimate of the remedial works required to address the defects recorded. These are very broad estimates. The sum of the total of these works is known as the structures “workbank” and give an indication of the scale of works that would be required to repair all the recorded defects on the stock. The current “workbank” is £2m.

Summary:

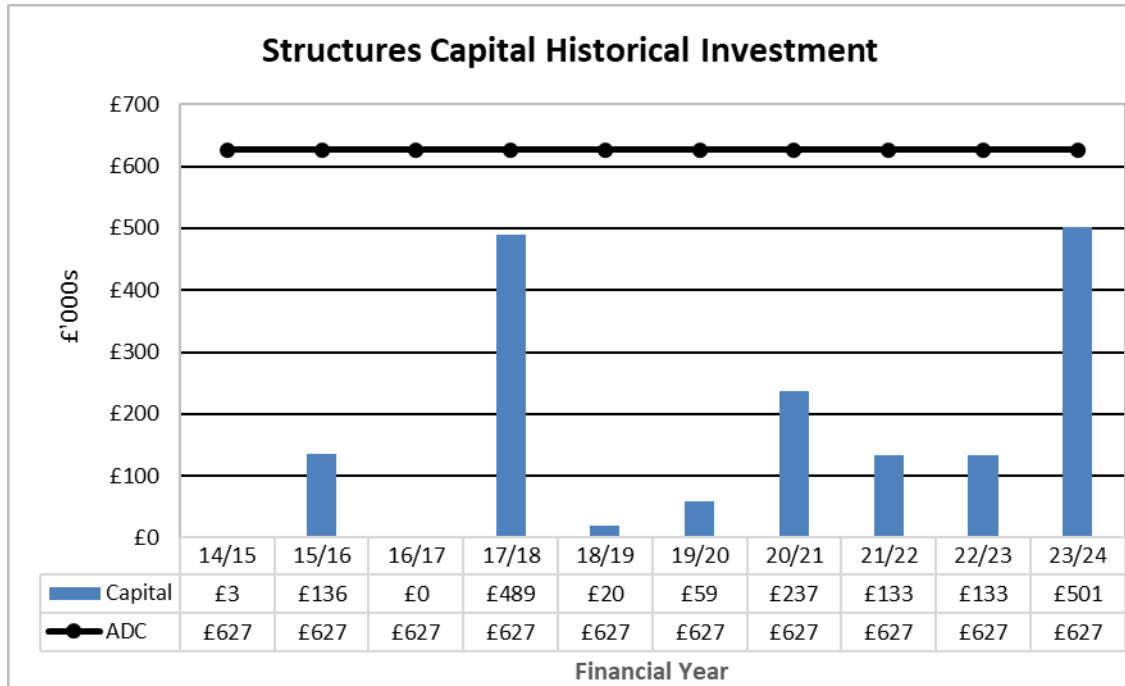
- A maintenance backlog of £655k has been calculated.

5. Historical Investment

The results above have been achieved from investment over the period reported. The levels of investment made to deliver the standards that have been achieved are reported below.

Capital Investment

Historical capital investment in structures has been as shown below



	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24
Capital	£3k	£136k	£0k	£489k	£20k	£59k	£237k	£133k	£153k	£153k

Average Investment

The average investment in planned maintenance between 2014/13 and 2023/24 is £171k pa.

Annual Depreciation Charge (ADC)

In 2015 the ADC of the structures asset was estimated at £627k. The ADC represents the average investment in replacement of the asset required each year over its lifespan to keep it in service. It is theoretically additional to the investment required to address the maintenance backlog.

Over the last 11 years investment in planned maintenance has been 27% of the ADC

This level of funding suggests that there may be a need to substantially increase investment in the future to keep the asset in service.

Investment/Cost of Routine, Reactive and Cyclic Maintenance

	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24
Reactive	Unknown							£12k	£15k	£22k
Routine and Cyclic	£51k	£51k	£53k	£53k	£53k	£53k	£53k	£41k	£38k	£31k
Other	£35k	£35k	£35k	£35k	£35k	£35k	£35k	£35k	£35k	£35k

Costs										
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Other costs include licence fees, bridge monitoring, principal inspections, surveys and developer approvals.

The average revenue between 2014/15 and 2023/24 was £87k pa.

The routine budget of £31k in 2023/24 was approximately 20% of the estimated need. Failure to complete routine maintenance may lead to increases in some defect types.

Summary:

- There has been very little spent on routine maintenance
- Over the last 10 years investment in planned maintenance has been 27% of the ADC

6. Works Undertaken

Planned Maintenance Outputs

The sums invested above have allowed works to be undertaken on the following number of structures:

Number of Structures with works funded by Capital	
Financial Year	Number of Structures
2022/23	6
2023/24	24

Reactive and Routine Maintenance Outputs

There are no records available to enable quantities of reactive and routine maintenance to be reported.

Summary:

- 24 structures received works funded by Capital investment in 2023/24