Silver Jubilee Bridge Complex - Major Maintenance Scheme

Full Business Case
Introduction - Section 1
October 2015

Halton Borough Council
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1 Introduction

1.1 Structure of Business Case

This document forms part of the Silver Jubilee Bridge Complex Major Maintenance Scheme business case. The business case is comprised of the following documents:

- a. Section 1 – Introduction (this document)
- b. Section 2 – Strategic Case
- c. Section 4 – Economic Case
- d. Section 5 – Financial Case
- e. Section 6 – Commercial Case
- f. Section 7 – Management Case
- g. Section 8 – Innovation Strategy

The above documents together make up the business case, in this revision, the Full Business Case (FBC).

1.2 Background

Halton Borough is a district in the North West of England originally created in 1974 as part of Cheshire County. Halton became a unitary authority known as Halton Borough Council (HBC) in 1998. The borough has a population of 126,000 with 67% of these of working age [source: Census 2011] approximately in line with the national average of 66%.

Halton as a borough has always had a number of challenges in economic terms and transport features highly in managing and overcoming these challenges. The borough has an Overall Deprivation Score of 32.5 compared with an English average of 19.2 [source: Index of Multiple Deprivation 2010]. This is consistent with the employment statistics showing 69.8% of people in employment in Halton against a Great Britain (GB) average of 72.4% with unemployment at 7.4% against a GB average of 6.5% [source: Office for National Statistics September 2014]. However, of the unemployed, 35% are looking for employment against a GB average of just 25% resulting in the need to continue to focus on generating sustainable employment and keeping existing businesses functioning in an economically sustainable manner.

Key to achieving these objectives in Halton is the level of employment in the transport and communication sectors which constitute 11% of employment in Halton compared to a North West average of just 8%. Similarly, and highly dependent on the transport and accessibility within Halton, is the high percentage of skilled manufacturing employment.
making up 14.5% of employment in Halton against a North West average of just 10.1% and a GB average of just 8.5%.

It is clear that Halton is meeting a number of key Government objectives with regard to employment mix (skilled manufacturing) and willingness to work, consistent with improving overall GDP. This is further demonstrated by the high level of full time jobs (74%) when compared to the national average of just 67% [source: ONS Sept 2014]. In addition, gross weekly pay stands at £512.5 against a North West average of just £482.5 and a GB average of £520.2. This clearly shows the value to the domestic economy of the jobs in Halton, meeting many of the Government’s objectives of creating high value employment. The contribution made by Halton Borough to the key growth sectors of the UK economy is clear. However, much of this economic industry is dependent both locally and strategically on the transport infrastructure. With significant sections of the economy dependent on the road network e.g. construction, wholesale, retail and motor trades along with transport storage (HBC 29.9% against a GB average of just 24.8%), Halton justifiably focuses on maintaining a high level of availability of its local and strategic road network.

It is important to note that despite the on-going challenge of unemployment within Halton, since the creation of the Unitary Authority in 1998, the Gross Value Added per head of population has risen from £9,613 per head in 1998 being in the lowest quintile to £19,063 per head in 2013 and bringing Halton in to the 4th quintile. This shows a 98% increase in GVA to the economy from Halton in the 14 year period compared to an English average increase of just 76.7% [source: ONS Regional Gross Value Added 2013 Dataset]. The Council’s focus on maintenance, high availability and provision of high quality local and strategic transport links is clearly having a significant impact on the economic contribution of Halton to the UK GDP.

Consistent with the above local strategy, Halton Borough Council has developed and implemented the Silver Jubilee Bridge Complex (SJBC) major maintenance strategy to ensure the continued safe availability of the strategic road bridge crossing of the River Mersey and Manchester Ship Canal between Runcorn in the south and Widnes in the north.

Figure 1-1 on page 3 show the general location of the scheme while Figure 1-2 on page 4 shows a map with the structures that make up the Silver Jubilee Bridge Complex.
Figure 1-1 Location of Scheme
Figure 1-2: Silver Jubilee Bridge Complex showing the Structures within the Complex

Ditton Road interchange (North) bridge
Ditton Road Interchange (South) bridge
Desoto Road Retaining Wall
Desoto Road Toe Retaining Walls
Desoto Road (East) Bridge
Desoto Loop Retaining Wall
Hutchinson Gantry
St. Patricks Retaining Wall
Desoto Sidings Bridge
B.C.R Retaining Wall
Ditton Road Bridge
Desoto Railway Bridge
Desoto Gantry

Widnes

Widnes Approach Viaduct
Silver Jubilee Bridge

Runcorn Approach Viaduct (West)
Runcorn Approach Viaduct
High Street Bridge Runcorn
Greenway Road Bridge

Source: Halton Borough Council
1.3 The History of the Silver Jubilee Bridge and Complex

The Silver Jubilee Bridge Complex (SJBC) replaced the Widnes-Runcorn Transporter Bridge, originally opened in 1905 as the first vehicular crossing of the Mersey in the Runcorn and Widnes area.

Following recognition by the Ministry of Transport that the Transporter Bridge had become inadequate for the amount of traffic using it, work on the Runcorn Widnes Road Bridge began in 1956 and was completed in 1961.

Most of the associated structures in the Complex were also constructed at the same time including the 328m Runcorn Approach Viaduct and 152m Widnes Approach Viaduct.

As a direct result of the construction of the Runcorn Widnes Road Bridge, trade in Runcorn increased six fold between 1960 and 1970, consequently increasing traffic usage of the bridge dramatically. In response, the Runcorn Widnes Road Bridge was widened in 1977 to carry four lanes of traffic in order to increase its vehicular capacity to 65,000 vehicles per day (vpd). At this time the Runcorn West Approach Viaduct extension was also constructed. In 1977, in recognition of the widening, the bridge was subsequently renamed to the Silver Jubilee Bridge (SJB) as it is known today.

Current daily vehicle numbers are in excess of 80,000 with occasional peaks over 90,000 vehicles per day. This is in excess of the Silver Jubilee Bridge’s current design capacity and results in significant congestion at peak times.

The Silver Jubilee Bridge (SJB) was given Grade II listed status by English Heritage in 1988 (scheduled as the Runcorn Widnes Road Bridge). The steel structure when opened was the largest steel arch bridge in Europe. The bridge is a landmark feature in the North West and remains the seventh largest bridge of its type in the world.

The Silver Jubilee Bridge Complex (SJBC) includes the Silver Jubilee Bridge (SJB), its three approach viaducts, eighteen other major highway bridges, eighteen retaining walls and two sign gantries, with all
41 structures forming the strategically important River Mersey and Manchester Ship canal crossing.

The availability of this strategic link in the regional road network is dependent on the condition and serviceability of all structures forming the Silver Jubilee Bridge Complex (SJBC).

Because of the age of the SJBC and the historical under investment in lifecycle maintenance prior to the formation of Halton Unitary Authority in 1998, the Complex requires a continual programme of structural and maintenance works to maintain it in a steady state condition and hence available for use.

In 2006, having identified the poor condition of much of the SJBC, Halton developed a long term maintenance strategy. This set out a number of interventions necessary to allow the structure to continue to perform and carry the excessive traffic load that it does today. In 2009 the Department for Transport approved a major maintenance scheme and £38 million of funding to remove a significant amount of maintenance backlog to the structures forming the SJBC including significant structural works. This scheme was subsequently delivered between 2010 and 2014. As part of the business case for this major capital intervention, it was also established that in order to maintain a steady state of maintenance long-term and to retain the value of the major capital investment, it would be necessary to continue to undertake between £1.6 and £2.2 million of maintenance works each and every year, on average. While this position was accepted it was also noted that Halton’s funding under the Formula Funding regime would never provide sufficient funds to cover the on-going maintenance at the necessary level. The result of ignoring this aspect would ultimately be to devalue the investment made in removing the backlog and eventually create the same maintenance deficit situation again. It is because of this scenario, that this current SJBC Major Maintenance Scheme business case is being submitted, essentially to provide gap-funding for capital maintenance works otherwise unfunded by the Formula Funding system.

During the period of 1998 to 2014, the staff of Halton’s engineering team has gained much experience, knowledge and expertise in the maintenance of the SJBC structures which can be used to great effect in maintaining the value of the recent investment in the Complex, and in ensuring the on-going steady state maintenance is achieved. However, with this experience and knowledge has also come a realisation that
efficiency in maintenance and investment must be optimised by exploring the most innovative technologies available.

The current Government and Minister for Transport has recognised the need for on-going proper investment in maintenance of infrastructure and particularly transport infrastructure. However, it has also set challenges to embrace technology, support R&D and help develop practical uses of the technological advances that are currently taking place at the most rapid pace ever. The Government and Halton in turn are intensely focused on reducing costs, wherever possible, without detriment to services and infrastructure both now and in the long-term.

Halton have examined a number of options with regard to the SJBC for its on-going maintenance and remain convinced that timely and appropriate investment in maintenance is the right way forward. This is also the only way to safe-guard the previous capital investment in removing the previous maintenance deficit.

Halton is acutely aware of the opportunities that innovation offers particularly in the rapidly developing sector of infrastructure asset management. Because of this and the Government’s current policy to support innovation in all areas of industry and the economy, Halton has included, as part of this Major Maintenance Scheme, a specific focus on innovation in the form of an Innovation Strategy specifically applicable to the SJBC. The purpose of this innovation strategy was to examine practical opportunities for utilising technology to improve the whole life maintenance approach to the SJBC and to cut the costs of this whole of life maintenance. The Innovation Strategy is explained in more detail in Section 8.

To this end, Halton has put together the following maintenance programme for the period April 2016 to March 2019.

1.4 Description of the Scheme

The proposed scheme includes a programme of maintenance works with particular focus on the Silver Jubilee Bridge and approach viaducts. The intention is to carry out the programme of works over a three year period from April 2016 through to March 2019. Halton is seeking a contribution from the Liverpool City Region (LCR) Growth Fund towards the capital elements of the scheme.
The main features of the proposed maintenance works include:

- **Concrete repairs and strengthening to the SJB deck soffit in light of inspections and testing showing severe deterioration of capacity in some areas.**
- **Re-waterproofing and subsequent re-surfacing works to Doctors Bridge and Greenway Road bridge to protect the structures from water penetration and subsequent deterioration.**
- **Repairs to the crosshead of Station Road bridge involving jacking of the bridge to undertake effective repairs. Also replacement of expansion joints, re-waterproofing and subsequent resurfacing.**
- **Trial replacement of SJB deck support cable and subsequent detailed analysis and inspection of condition, following previous identification of high risk factor.**
- **Replacement of south abutment and intermediate pier bearings on Runcorn Approach Viaduct West.**
- **Undertake Special Inspection of the post tensioned deck units on Station Road Footbridge that spans the Daresbury Expressway and SJB north bound on-slip, including concrete testing (no inspection previously done since construction)**
- **Principal Inspection of all above road deck steelwork.**
- **Replacement of deteriorating parapets at the northern end of Runcorn Approach Viaduct West and on the eastern face in the vicinity of the merge with the Runcorn Approach Viaduct.**
- **Replacement of eastern parapet and cantilever strengthening on the Widnes Approach Viaduct.**

The intention is to undertake the works in a manner that will cause minimum impact on users, minimise traffic congestion caused by the works and reduce the deterioration in air quality caused during periods of excessive queuing. Taking this into account, the extensive schedule of works has been phased over a 5 year period, however this scheme bid addresses primarily the first 3 years of the maintenance programme. In the event that the LCR Growth Fund is able to provide funding beyond this period, the Council has also included both the schedule of works and anticipated costs for the 5 year programme of maintenance works.

The works described in this section constitute the preferred option as identified in the Options Appraisal Report (OAR).
1.5 **Relationship to the Mersey Gateway Project**

The Mersey Gateway (MG) project is entirely dependent upon the availability of the Silver Jubilee Bridge Complex and hence this major maintenance scheme.

The MG project makes provision for motorised road traffic only with no provision (except for emergency requirements) for pedestrian or cyclist facilities, or for utility apparatus. This was a deliberate decision in conjunction with the Department for Transport in order to minimise the cost of the new crossing infrastructure. Given the historic nature and listed status of the SJB, it has been the position throughout, that maintenance of the SJB and its associated structures forming the SJB Complex was a requirement, despite the Mersey Gateway project.

The continued use of the SJB for the provision of enhanced non-motorised transport provision is therefore a fundamental part of the Mersey Gateway project and requires the on-going maintenance of the SJBC.

The SJBC therefore continues to be a vital crossing for residents and businesses despite the additional provision for motorised users facilitated by the MG project.