Professional Support Service

cycling england

Bournemouth Borough Council

Tuckton Bridge

Final Report

October 2007

Contents

1. Introduction

This report was prepared on behalf of the Cycling England Professional Support Service by Alex Sully of Transport Initiatives. It follows a request from Bournemouth Borough Council (BBC) for help in developing potential improvements to Tuckton Bridge to make crossing it safer and more convenient for cyclists.

2. Background

Tuckton Bridge carries the B3059 across the River Stour which, at this point, is also the boundary between Bournemouth and Christchurch Borough Councils. The nearest available alternative river crossings are at Barrack Road, roughly 2 kilometres to the west, and the Mudeford ferry even further to the east. Neither of these crossings represent realistic alternatives for cyclists making local journeys across Tuckton Bridge.

The use of the bridge is identified as a 'Proposed Cycle Route' on the Area Cycle Map jointly published by Bournemouth, Poole and Christchurch Borough Councils and Dorset County Council. The bridge also carries the National Cycle Network Route 2 as an alternative to the route around Christchurch Harbour using the Mudeford ferry.

Extract from Area Cycle Map

3. The bridge

A plan of the bridge and its immediate surroundings is attached to this report as Appendix A.

Tuckton Bridge is a 'listed' structure being one of the earliest surviving Hennebique (reinforced concrete) bridges in Europe and was the first significant bridge of its type built in the UK (1904). It is 104.5m in length and is carried across the river on a series of piers and arched supports. The attractive cast iron balustrades are not, however, contemporary and date from the nineteen twenties. The bridge is understood to need regular, and sometimes significant, maintenance due to the nature of its construction.

The bridge deck comprises a carriageway 5.4m wide with two footways each 1.7m wide to either side. The footways both have 400mm wide markings and signs at either end to encourage pedestrians to keep away from the kerb and beware of vehicle overhangs which principally take the form of wing mirrors.

Concrete bridge structure and cast iron balustrade

Picture: Alex Sully

Underside of the bridge

Picture: Alex Sully

Tuckton Bridge is classified as a 'weak' bridge and is subject to a 13 tonne gross vehicle weight restriction. It is, however, a busy bus route but only one bus is permitted to be on the bridge at any one time.

Buses frequently cross the bridge and leave no room for cyclists alongside

Picture: Alex Sully

Large commercial vehicles fill the lane and their mirrors overhang the footways

Picture: Alex Sully

If two lorries meet there is hardly enough space to accommodate them both

Picture: Alex Sully

In the face of equally wide on-coming traffic, buses and light lorries drive as close as possible to the edge of the carriageway with their tyres rubbing against the kerb. To discourage drivers from doing this, steel kerbs have been introduced and signs on the approaches to the bridge warn drivers that mounting the footway is prohibited.

Bridge and signage seen looking south from roundabout

Picture: Martin Dover BBC

4. Use by cyclists

No details of cycle flows across the bridge are available but during a late-morning site visit a constant flow of cyclists was observed together with a steady stream of motor vehicles. During the morning and evening peak periods very heavy flows of motor traffic give rise to congestion on the approaches to the bridge and the roundabouts to the north and south of it. Children cycling between the residential areas to the south of the railway line and the schools in neighbouring Christchurch use this route on a daily basis.

During the site visit cyclists were observed using both the carriageway and the footways over the bridge both with flow and against the flow of other traffic. Some cyclists chose to dismount and push their bikes along the footway but this was not always the case. No conflicts between cyclists and pedestrians were observed. Where these users met interaction appeared courteous as though the difficult conditions for both parties made them recognise each others' needs. It was, however, noticeable and somewhat surprising that two cyclists dressed in the manner of competent, experienced riders (i.e. wearing cycle-clothing) also chose to use the footway contra-flow. Under normal circumstances, these cyclists would have been expected to cycle on the carriageway but in this case chose not to. It is assumed that their trips had origins and destinations on the eastern side of the bridge and that they found it easier to negotiate the bridge and roundabouts by using the footway.

'Experienced' cyclist using the footway contra-flow

Picture: Alex Sully

On-carriageway conditions for cyclists can be difficult and often intimidating as motorists are unable to pass without pulling out into the on-coming lane to pass; leading to them being perceived as holding up 'proper' traffic. This situation is balanced somewhat by the fact that the narrowness of the carriageway results in low traffic speeds, even off-peak during the daytime. It is possible that the low speed differential leads to motorists accepting that progress is not so much impeded by the cyclists ahead of them as the general traffic conditions. Nevertheless, roughly half of the cyclists observed using the bridge chose to cross by cycling or pushing their bikes on the footway.

Cars must pull out into the on-coming lane to overtake cyclists using the carriageway

Picture: Alex Sully

Some cyclists clearly prefer to cycle on the footway rather than face the conditions on the carriageway

Picture: Alex Sully

As one cyclist on the carriageway proceeds at her own pace (in front of the red car) a faster-travelling cyclist uses the footway to overtake

Picture: Alex Sully

5. Options

The apparent available options are set out below together with comments on their viability.

A. Encourage cyclists to use alternative routes

In effect there are no alternatives. The routes via the next upriver bridge and the Mudeford ferry do not represent viable alternative routes as they neither match the evident desire line nor do they represent a practical or realistic detour. The same applies to the use of the Bailey bridge erected by the Army across the River Stour just to the north of the railway line if it were available for use by the public; currently it is not.

B. Introduce 'shuttle working' controlled by traffic signals

The road space available between the bridge and the roundabouts at either end of it does not provide sufficient capacity for stacking vehicles and this would lead to unacceptable tail-backs blocking the roundabouts. The length of time taken by cyclists to clear the bridge would make this situation worse thanks to the need to extend the 'all red' to enable them to finish crossing. The resulting lengthy signal cycle time would almost certainly lead to cyclists using the footways to avoid the signals.

C. Build a new road bridge and leave the old one to cycle and pedestrian use

This option assumes that if a new bridge were to be built the existing one would be retained because of its 'historic significance'. Clearly, wholly replacing the existing bridge with a new one with a wider deck capable of providing adequate space for cyclists would be a better solution. In addition, a new bridge alongside the old one would almost certainly be built to a standard that would attract some cyclists and pedestrians away from 'their bridge' thus lessening its value as an alternative.

Nevertheless, a new bridge is an attractive, if expensive, option and could be created on an alignment immediately to the west of the existing bridge by going through the pub car park. However, even if the funds could be found to achieve this new river crossing there would still remain the question of how cyclists and pedestrians would reach 'their' bridge if their journey did not start or finish on the eastern side of the existing bridge. The likely solution, a toucan crossing at either end (accompanied by new facilities created around the roundabouts), would undoubtedly have an adverse impact on motor traffic capacity. Whilst the latter might be acceptable in the context of encouraging a modal shift in favour of cycling the overall cost, including that of the new bridge, is likely to render this solution unacceptable.

D. Build a new free-standing cycle and pedestrian bridge to one side of the existing bridge

Whilst this is a cheaper option than C it would still need some form of crossing at each end. As before this would again have an adverse impact on traffic capacity on the carriageway unless two cycle/pedestrian bridges were to be built, one on each side of the existing one. Even if the latter course were to be adopted it is likely that cyclists would still choose to cycle two-way on each side, depending on where they started their journeys, resulting in the need for wide new structures alongside (3m clearance between parapets as a minimum). This approach would result in constructional difficulties because of the shortage of available space on the eastern side (see below) and some additional works at either end to regularise the existing practice of cycling on the footway to reach the bridge.

E. Create a wholly new pedestrian and cycle bridge on a new route to the west

The creation of a completely new route by linking the two recent residential developments to the west of the bridge and Belle View road/Stour Road, i.e. between Riverside Road and 'The Meridians' (see layout drawing) via the car park on the western side of the pub, looks to be an available, if expensive, option. However, it is considered that this route represents such a long detour, coupled with the need to negotiate the two roundabouts, that those cyclists whose journeys begin and end to the south and east of the existing bridge would not divert to it.

F. Widen the existing bridge to create pedestrian/cycle facilities on widened footways

The fact that this is a 'listed' structure should not be seen as a barrier to its alteration. The existing balustrade is not part of the original bridge and its alteration or even complete removal should not be viewed as prohibiting change, especially if a sensitive replacement can be found. It seems unlikely that the bridge is particularly valued on aesthetic grounds so much as on the history of construction techniques. This is particularly so as the comparatively recent addition of supports for services slung under the bridge detracts from its visual quality when seen from the eastern side.

As an alternative to widening the existing structure, suitable free-standing structures abutting the existing bridge could carry the re-sited balustrade and a new pedestrian footway of 2m wide on both sides. This would leave the existing footway free to be converted to a cycle track. Removal of the existing balustrade would liberate an additional 300mm or so which could be included in the overall width of the cycle track making this also 2m wide (less a 0.5m rubbing strip at the kerb). This would be ample for one-way cycle flows and if the cycle track and

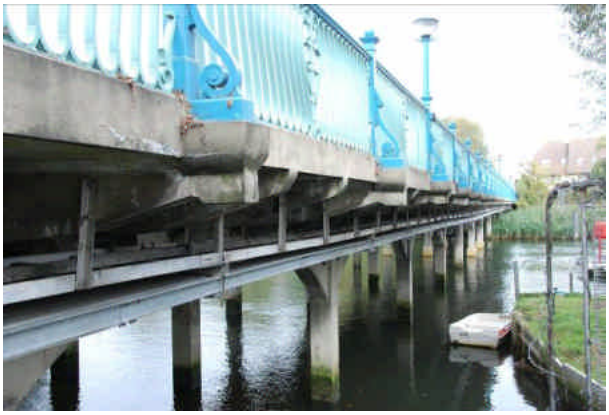
footway were to be segregated from each other by an upstand (recommended) of no more than 50mm this would also create enough space for cyclists to pass each other if travelling in opposite directions. The practice of cycling against the flow should, however, be discouraged as far as possible in view of the available width but it is acknowledged that this practice would be unenforceable.

The use of a small upstand would not only be of benefit to the blind and partially sighted who are taught that 'up means safe', on a practical note, it would also make it easier to achieve a smooth vertical alignment for the adjacent structure which would not be reliant upon matching the level of the existing structure exactly.

Removal of the balustrade should liberate an additional 300mm

Pictures: Alex Sully

The substitution of the existing cast iron balustrade for an equally attractive modern one made from lightweight materials would go a long way to off-setting the inevitable increased load carried by the bridge as this is sure to be an issue if changes are made to the existing structure to achieve the suggested widths.



Services slung underneath the bridge

Picture: Alex Sully

In terms of procedural and construction issues the creation of a wider footway/cycle track on the western side looks to be more straightforward than the eastern one. On the western side land could be taken from the pub car park with little if any adverse impact on the car park's operation. The existing wide footway at that point could form the natural starting point for any new structure or widening of the bridge which could continue as far as the existing abutment on the other side.

On the northern bank the land to the rear of the western footway does not appear to have any particular function that would preclude this suggestion. The existing ramp down to the riverside also has no clear purpose and its closure might increase security for local residents and deter unwelcome users (a discarded, used syringe was spotted during the site visit).

Wide footway at the southern end of the bridge on the western side

Picture: Alex Sully

Ramp down to the riverside just visible to the right of the hedge – northern end, western side

Picture: Alex Sully

Two views of the existing abutment, northern end, western side

Picture: Alex Sully

On the eastern side the creation of a wider footway would necessitate the loss of a mature tree and alteration to the marina access at the southern end.

The tree that would be lost is the one behind the weight restriction sign

Picture: Alex Sully

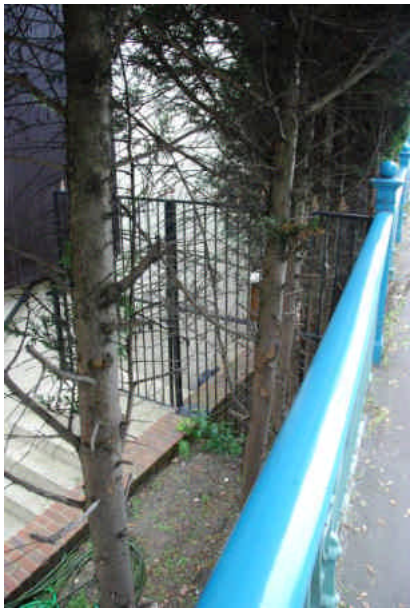
The marina access

Picture: Alex Sully

At the northern end it would be necessary to acquire land from the adjacent house or the right to 'over-sail' those parts of the property (side, front and back) that are below the level of the bridge. This would also necessitate the loss of a hedge and probably require mitigation measures such as improved security, and possibly screening, for the affected property.

Housing on the eastern side, northern end

Picture: Alex Sully



Security gate on flood bund between house and bridge parapet – eastern side, northern end

Picture: Alex Sully

It is not recommended that new cycle tracks be created on free-standing structures alongside the existing bridge whilst leaving the balustrade in place. This would create potential conflict points where cyclists cross the path of pedestrians using the footway at each end In addition, pedestrians who mistakenly chose this route would be trapped between the balustrade and the new parapet with little room for cyclists to pass. This could, however, be an option for new pedestrian-only routes with the proviso that cycle flow on the converted footways should only be one-way (impossible to enforce).

G. Close bridge to all but bus, cycle and pedestrian traffic

In the context of addressing climate change and encouraging modal change this is the preferred, and by far the best, option: it would also be the cheapest. Whilst in the shorter term such a solution would inevitably increase motor vehicle mileages, the existence of considerable cycle flows in the off-peak period suggests that there is likely to be latent demand which may well be released if motor traffic were to be diverted to more suitable routes such as Barrack Road and the Christchurch bypass. Such an approach would also sit well with policies to increase walking and the use of public transport. It would also improve the environment around the residential areas near to the bridge and create safer routes to school for those children who cross the bridge each day. As an added bonus it would also reduce the 'wear and tear' on an already 'weak' structure.

H. Do nothing

Clearly this is an available option but unless there are doubts about the condition of the bridge, and it is thought that in the foreseeable future it may prove necessary to introduce further traffic restrictions or undertake major maintenance work, this approach is not recommended.

6. Recommendations

The recommendations of this report are as follows:

I. Undertake full classified traffic survey to determine use by all modes – summer and 'neutral' months (if this information is not already available):

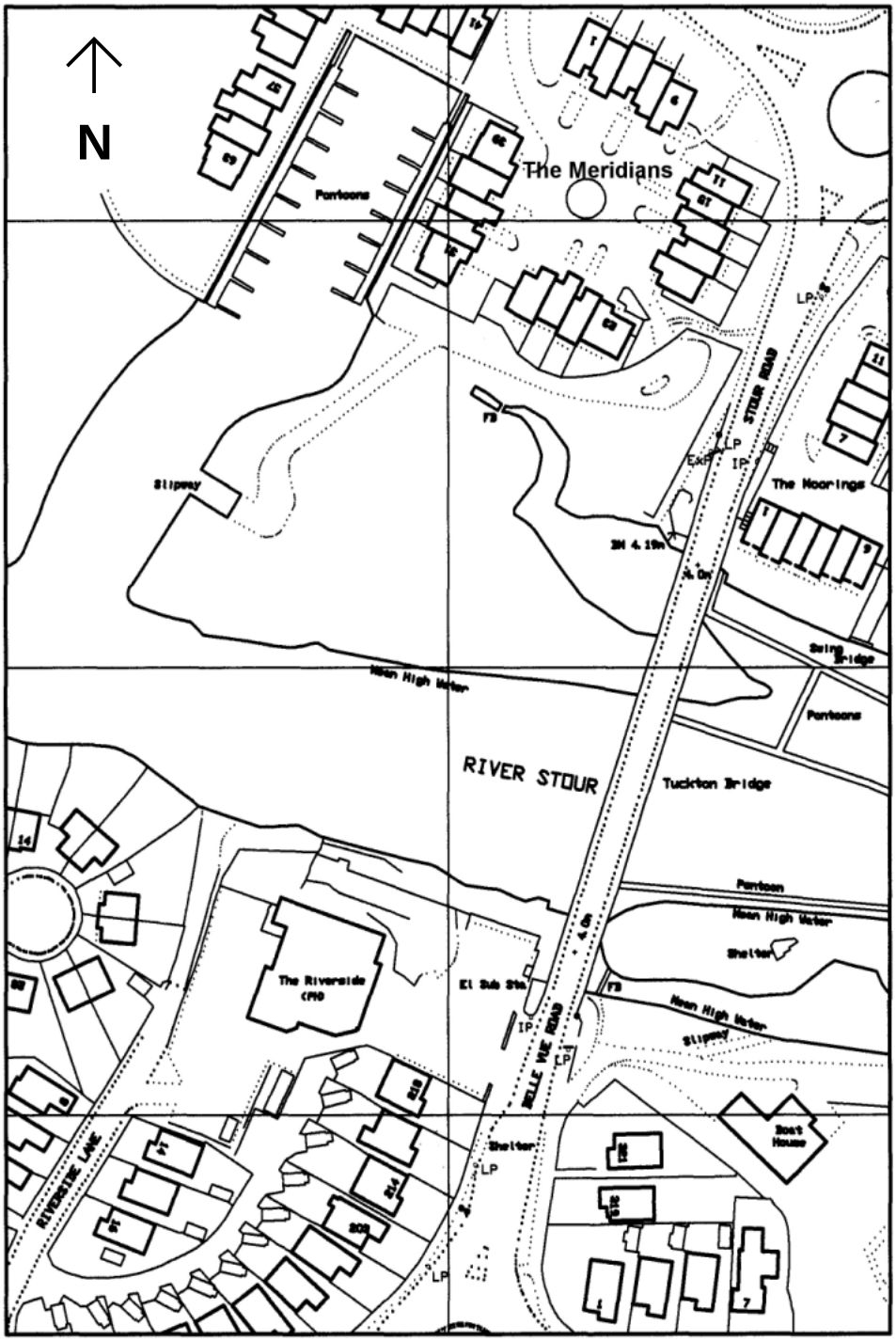
II. Pursue the option of widening the footways, if necessary by the use of free-standing structures abutting the existing bridge, on each side to accommodate cycle and pedestrian use. This process to start by holding discussions with English Heritage regarding what changes to the structure would be acceptable* (illustrations of solutions implemented elsewhere are attached as Appendix B);

III. If discussions prove fruitful, undertake costed feasibility study and seek funding for implementation (for example this could include Local Transport Plan, sums secured through S.106 agreements from any new development in the area and others as set out on the Cycling England website at: http://www.cyclingengland.co.uk/engineering.php);

IV. Evaluate the likely impact of closing the bridge to all but buses, cyclists and pedestrians and add proposal to long term transport strategy.

* It is also recommended that the crashworthiness of any new parapet should be determined not simply by adherence to standards laid down for trunk and motorway routes (i.e. Design manual for Roads and Bridges) but by the completion of a risk assessment based on the history of loss of control of vehicles using the bridge (large good vehicles are already banned) and the introduction of measures to ensure low speeds such as the introduction of a 20 mph speed limit. This approach matches that advocated by Manual for Streets (DfT 2007).

Appendix A – Location Plan



Extract from BBC drawing TR1/1/17/TUC – not to scale

Appendix B – Examples of solutions introduced elsewhere

Bridge bolted on to existing structure - Wales

Picture: Sustrans

Great Eastern Cycle Route - Peterborough

Picture: Tim Pheby

Ribble Link

Picture: Steve Essex

Spiders Bridge - Sheffield

Picture: Tim Pheby