

## TECHNICAL NOTE

**Job Name:** Sharpness Vale  
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**Subject:** **Status and context of the Restoring your Railway – Sharpness Branch Line - Outline Case Submission – 30<sup>th</sup> September 2020**

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### 1. Introduction

- 1.1. As part of the development of Stroud DC's submission for support through the DfT's "Restoring your Railway" fund ("RyR"), a range of supporting evidence was prepared. Sharpness Development LLP, as promoters of the Sharpness new settlement (included in the draft Local Plan as strategic housing allocation PS36), contributed a document titled "Restoring your Railway – Sharpness Branch Line - Outline Case Submission – 30<sup>th</sup> September 2020".
- 1.2. The Outline Business Case document provided supporting information for the purposes of the RyR bid process to provide confidence to DfT that the scheme was both viable and deliverable. The original document is attached to this note, but with redactions in respect of personal information related to individuals involved in compiling the note and the addition of a footnote to explain the updated status of one of the members of the Sharpness Development LLP.

### 2. Context

- 2.1. The document was provided as a supplementary submission, outside of the formal RyR process, in response to queries raised by DfT after the first round submission was completed by Stroud DC. DfT considered that the level of detail available in respect of the Sharpness branch line proposals might allow them to be considered under a different funding regime or to transfer to a capital schemes process. Hence, they asked for greater detail of the proposals, to the extent that this was available, in order for them to determine which process would be most appropriate for the Sharpness scheme to be placed within.
- 2.2. Therefore, the Outline Business Case document was produced to bring together all of the deliverability and viability information that was available at the time to better inform DfT's decision making process.
- 2.3. Subsequently DfT advised that they had concluded that the RyR process did represent the best mechanism to promote the Sharpness scheme, and this resulted in the formal bid by Stroud DC to the third round of funding for funds to complete a formal Business Case submission for the Sharpness Branch Line.

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### 3. Status

- 3.1. It should be recognised that the Outline Business Case document was not produced as formal submission, and was provided in a standard business case format to make it easily recognisable and understandable for officers at DfT when it was provided to them. However, the document does not comprise a complete business case, as more work remains to be done in respect of site specific costs, and the way that governance would be managed by the local authorities. This was not information that was available at the time, or which was not available to Sharpness Development LLP and its team as it relates to issues that are matters for Stroud DC to manage in the fullness of time.
- 3.2. However, the conclusions reached by the Outline Business Case in terms of the technical appraisal, the likely monetary benefits that can be ascribed to the scheme, the deliverability of it and the commitment of the various stakeholders to work together to bring it to fruition is both robust and demonstrates the viability of the proposal.



**Restoring your Railway –  
Sharpness Branch Line**

Outline Case Submission

September 30, 2020

Prepared for:

Sharpness Development LLP

Prepared by:

Stantec UK Ltd

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## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

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# RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

## Introduction & Context

### 1.0 INTRODUCTION & CONTEXT

This submission, sponsored by local MP, Siobhan Baillie, is made by Stroud District Council (SDC) in partnership with Vale of Berkeley Railway Charitable Trust (VoBR) and Sharpness Development LLP in respect of the reuse of the Sharpness branch line for passenger services that will link Sharpness to Gloucester. The Sharpness branch line was originally constructed by the Midland Railway company and connected the port and docks at Sharpness, on the River Severn, to the mainline to the east, between Bristol and Gloucester. The line first opened for freight trains in 1875 and passenger services were added in 1876. Passenger services were withdrawn in November 1964, but the line remains open for freight traffic to and from the former Berkeley Power Station and onwards to the intact, though largely unused tracks into Sharpness Docks.

This is a second submission, following the initial submission made in response to the Government's "Restoring your Railway" initiative in May 2020. This submission is necessarily more detailed, and provides further information on the proposals since the initial submission, including a greater assessment of the business case for the scheme. However, the two submissions should be taken together in outlining the case at Sharpness – the initial submission setting out the concept of re-opening the passenger services along the branch line, and this document setting out the detail of the costs and benefits.

This submission has been set out to follow the typical format of a business case, as it is considered that this format will provide information in a well-known and recognised format, which will be helpful to anyone reading the submission.

The earlier submission outlined the principles to reinstate passenger services by VoBR onto the existing Sharpness branch line to support and enhance local tourism and leisure opportunities in the short term. It also proposed the reintroduction of twice-hourly passenger services from Sharpness to Gloucester railway station (via Cam and Dursley), providing the ability for onward journeys to Bristol and Birmingham. This latter service would be introduced in parallel with the proposed development of a new growth point at Sharpness known as Sharpness Vale, and delivered on Garden Village principles.

The proposal brings together aspirations for heritage and tourism activity along the branch line, support for much needed housing provision in the district and creating synergy with existing plans for development in the area. The proposals have been developed in a way that recognises the proposals by the Canal and River Trust and others regarding mixed use development of Sharpness docks to regenerate and energise the local economy.

Historically the Sharpness line was not a branch line at all, but, as part of the Severn and Wye Railway, connected across the River Severn via a bridge located immediately to the north of the docks. This made a direct connection to Lydney and onwards into the coalfields of the Forest of Dean. In addition to the services that were scheduled to run on it, the crossing was also often used as a useful diversionary route when the Severn Tunnel was closed for maintenance. This continued until 1960 when the bridge was damaged in a collision between barges on the river. At the time it was deemed uneconomic to repair and so was ultimately closed and later demolished. This severed the social and economic links between communities on both side of the river.





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There has been discussion amongst local politicians and other stakeholders over the years about reinstating a bridge.

The latest proposals are set out in the Gloucestershire “Vision 2050”, produced by Gloucestershire County Council. This sets out the case for a new crossing, and the benefits it could bring to the area. The details are shown on the glos2050 website: <https://glos2050.com/ideas/lydney-sharpness/>

Collaboration between Sharpness Development LLP and VoBR will enable an increase in tourism, leisure and education opportunities, together with sustainable transport opportunities for local communities, with consequent economic benefits and job creation. These benefits support the objectives of the Stroud District Local Plan and the emerging draft Local Plan as discussed in more detail later within this submission.

## 1.1 HISTORY OF THE SCHEME

The idea to re-open the line to passenger services was initiated by the VoBR some years ago, with the aspiration that the railway could form a heritage attraction to add to the tourism economy in the area, and ensure the protection and retention of the railway heritage in the area.

The VoBR holds a lease from Network Rail to build its operational base and railway heritage and museum site on land known as Oldminster Sidings near to Newtown at the northern end of the branch line. From there, it has been seeking a further lease to operate a heritage steam and diesel service between Sharpness and Berkeley, with a phased extension to Berkeley Road, where the branch joins the main line. This aspect of the scheme is developed solely as a tourism and heritage attraction, and would not offer regular, scheduled services for commuters or shoppers, for example. It would be operated by volunteers, mostly at weekends and holiday periods.

VoBR have identified the potential to extend some services onto the mainline as part of its tourism and heritage operations. This could include charter services from elsewhere onto the Sharpness branch, and tourism related services as far as Gloucester on an occasional “special service” basis.

VoBR is already in discussion with the current freight operator (Direct Rail Services) regarding safe interaction between VoBR and DRS services along the branch. This is not seen as being likely to be problematic, as the current freight services only operate on one day each week.

More recently, Sharpness Development LLP has formed as the promoters of a new settlement, following Garden Village principles, at Sharpness which is proposed for allocation in the Stroud Draft Local Plan Review. The aspirations of both VoBR and Sharpness LLP coincide and the two bodies are working closely, together with SDC and the local MP, Siobhan Baillie, to facilitate this wider project.

### 1.1.1 History of the railway

As originally opened to passenger services in 1876, the line ran westwards and northwards from the main line, for about 6.5km to the docks. There was a station at Sharpness and one at Berkeley. However, by 1879 the Severn Bridge Railway had opened the bridge to Lydney and the Forest of Dean enabling coal to be transported to Sharpness docks from mines in the Forest of Dean. A regular passenger service then ran across the river between Berkeley Road and Lydney. Freight trains also crossed the river, and this contributed to the busyness of the docks.



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Initially the only connection to the mainline was to and from the north – towards Birmingham (and Gloucester by a spur to the north). But in 1908 a further chord was built to the south, allowing trains to approach and depart from the Bristol direction. This meant trains between Paddington, Bristol and Cardiff could be maintained when the Severn Tunnel was closed, so avoiding a long detour via Gloucester.

The railway operated in this form until October 1960, when an accident involving two barges on the river demolished part of the bridge. The bridge was beyond economic repair and so branch line services continued between Sharpness and Berkeley Road, but only for a few years. The stations at Sharpness and Berkeley were closed, and were demolished, and some railway infrastructure was removed. The track layout was reduced to a locomotive run round loop at Sharpness and access to the nuclear flask transshipment facility at Berkeley that is still operated by DRS. The line speed was reduced to 15 mph, and at some point, after that the south facing chord was lifted.

The line remains operational as far north as Sharpness Docks, though there are no current freight services that use the docks. The only regular use of the line is for the movement of spent nuclear material from the former Berkeley and Oldbury Power Stations, and other sensitive sources, to be transported to Sellafield for re-processing. These trains occur roughly once each week.

The possibility of making use of the line for heritage and tourism purposes took shape in the last decade or so. The Sharpness Berkeley Railway Ltd, using the trading names "Berkeley Vale Railway" and "The Beaver Line", proposed use of the line for passenger trains. Although some site clearance work was undertaken, and some work to track, the company was wound up in mid-2012.

VoBR was formed in August 2015, taking a lease on the former works shed at Sharpness Docks, where it has established an engineering machine shop and restoration facility for items of railway equipment to be used in its proposed operations going forward on the branch line. Today, the route of the Sharpness branch line lies wholly within the ownership of Network Rail. VoBR and Sharpness Development LLP have been in ongoing discussions with Network Rail in respect of the proposals.

VoBR's third site is at Berkeley station where it has been undertaking some preparatory work to prepare the site for potential future heritage operations. They have been discussing a potential lease with NR, so that they could control the line, but this has not been concluded at the time of writing, although a lease has been granted to build storage and maintenance facilities at Sharpness.

### 1.1.2 Policy Context

SDC fully supports the re-introduction of passenger services to the Sharpness branch line and more broadly supports investment in the rail network through the District. The current adopted District Local Plan (2015) supports proposals for opening or reopening passenger stations and halts and has safeguarded sites at Stonehouse Bristol Road and at Hunts Grove for the provision of new stations.

SDC is in the process of reviewing the current Local Plan (adopted in November 2015), and the current programme envisages that the Plan will be adopted by winter 2021/early 2022.

As part of the Local Plan review process, SDC has declared a target that Stroud District will become carbon neutral by 2030, ahead of the Government Target of net Zero Carbon by 2050. This cross-cutting issue is touched upon by many of the Draft Plan's key issues and emerging Strategic



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Objectives, and responses to it are embedded in the overall Development Strategy, as well as detailed policies and proposed site allocations.

The provision of new and improved rail opportunities within the District clearly has an important role to play if SDC is to achieve this ambitious target.

The Draft Plan sets out SDC's preferred strategy for meeting growth and development needs over the next 20 years. Some of the key aims and opportunities of the Draft Plan include:

- Creating new sustainable communities at locations where development can deliver transformational change and help to create a sustainable and vibrant economy;
- Continuing to develop the tourism potential of Stroud District as a unique selling point for living, working, visiting and investing in the District;
- Investigating transport improvements to link Stroud to Bristol, the Midlands and Wales; and
- Promoting healthier alternatives to the use of the private car and seeking to reduce CO2 emissions by using new technologies, active travel and/or smarter choices, working towards a more integrated transport system to improve access to local goods and services.

The Draft Plan needs to accommodate land for at least 12,800 new homes over a 20-year period (a 40% increase from the figure in SDC's current Local Plan) and around 50 hectares of employment land. In order to meet the increased levels of growth required to meet the Government housing targets, there will be additional pressure on Stroud's roads, particularly at key network junctions within the District. Initial transport work to support the emerging Local Plan has identified the likely need for major improvements at M5 junctions 12, 13 and 14, together with improvements along the A419 and A38 corridors. To minimise the need for highway improvements it is essential that the need to travel is minimised and what trips do need to be undertaken are made through sustainable modes of transport. Investment in our rail network therefore forms part of SDC's strategy to deliver sustainable growth.

In order to help meet these growth requirements, the Draft Plan is proposing the allocation of a new settlement, following Garden Village Principles, at Sharpness (referred to throughout this submission as 'Sharpness Vale') under site reference PS36.

The draft allocation proposes the development of up to 2,400 dwellings by year 2040, and up to 5,000 by 2050, as well as 10ha employment – intended to be complementary to the existing employment uses at Sharpness Docks, local centre with retail and community facilities, community uses (including new secondary school), open space and Green Infrastructure as well as the reopening of the Sharpness Rail branch line for passenger services to Cam and Dursley and Gloucester. The existing railway is operational – used by freight trains at present and could be easily re-opened for passenger services that would help facilitate sustainable longer distant travel from Sharpness Vale, support sustainable growth in the area and to further enhance tourism in the area.

In addition to the above, land at Sharpness Docks is proposed as an allocation under site reference PS34: Sharpness Docks for a mixed-use development and the Canal and River Trust has submitted a planning application in support of this allocation which is pending consideration. The proposals comprise of dock uses and dock related industrial distribution uses, including 7 ha expansion land, to the south and a mix of tourism, leisure and recreation development including up to 300 dwellings to the north. This allocation is being carried forward from the adopted Local Plan under Policy SA5.



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However, the potential for growth at Sharpness, in terms of both residential development and economic activity is constrained by the lack of suitable infrastructure and access. This is both in terms of the limitations of the highway network, but also the lack of use of the existing railway infrastructure. At present the railway represents a public asset that is underused but could provide a key sustainable transport opportunity that will lead to sustainable growth and a reduction in carbon output.

#### 1.1.3 Vision for Sharpness Vale as a growth point

At present, Sharpness principally has an employment role in the District, although there is some existing residential development within the small settlements surrounding the area including: Newtown, Wanswell, Brookend, Old Brookend. The market town of Berkeley also lies to the south east.

Sharpness Docks is a thriving and busy port, the eighth largest in the South West and serving as the gateway from the River Severn to the Gloucester & Sharpness Canal. The Docks are operated by the Canal & River Trust and in addition to accommodating passenger services, improving the Sharpness branch line presents the opportunity for increased rail freight opportunities to and from Sharpness Docks as discussed later in this submission.

At the same time, there is scope for new development at Sharpness focusing on the leisure and tourism potential of the Gloucester-Sharpness canal and its Severn Estuary location. The regeneration of Sharpness Docks has been a long-term aim for SDC, it provides an exciting opportunity to create a new heritage-and leisure-led, sustainable tourism destination making the most of an under-realised heritage interest, with the exceptional quality of the natural environment and the canal and marina anticipated to attract local people and visitors from outside the District.

The overall vision, as advocated in the emerging Local Plan, is that a new settlement at Sharpness, together with improvements to the working environment and leisure amenities at the Docks and the recent development of Gloucestershire Science and Technology Park at the former Nuclear Power Station site, will provide a local boost. These will act together with local visitor attractions (including Berkeley Castle, Dr Jenner's Museum, Slimbridge Wildfowl and Wetlands Trust, restored heritage railway and several safe and attractive walking and cycling routes) to raise the profile of this part of the District.

The intention is for the neighbourhoods at Sharpness Vale to grow organically in the future in a logical and sustainable manner benefiting from the new infrastructure created by the initial development. Sharpness Vale has been designed to be a genuinely mixed use, new community where it is intended that people will be able to live and work in the same place. The design of the development will also look to prioritise personal modes of travel over road-based travel that will ensure that most internal trips are undertaken in a sustainable manner. Connecting the development by rail will give people a genuine choice in the way they travel longer distances and will help to further reduce reliance on the private car. Sharpness Vale will therefore be a sustainable growth point for the District for the forthcoming Plan period, and for future Plan periods, based on sustainable infrastructure that will allow for successive phases of development to be rolled out using this infrastructure. Having an identified and sustainable growth point will also take away the anxiety of local communities of where tiers of growth may end up in the future.



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The proposals for Berkeley Station are very important to the development of the railway since the station has the potential to become a major new amenity for the town. VoBR's plans include rebuilding the attractive station building, which will provide visitors with a café, waiting room and other facilities. It is expected that Berkeley Station will become not just a place to catch trains to and from work, but also a leisure venue where cyclists, walkers and others can enjoy a break and refreshment in pleasant surroundings. It will also become a venue for social events such as classic car rallies and other community activities.

Together, these proposals will help to deliver the District's objectives to boost housing, tourism, leisure and education opportunities, with consequent economic benefits and job creation for Sharpness and the wider area, as well as helping to enable a step change in how people travel and assisting the District in meeting its Carbon Neutral agenda earlier than the Government's target date of 2050.

#### 1.1.4 Re-using existing assets

Importantly, the proposals at Sharpness are somewhat different to other proposals that will likely be submitted to secure funding under the Restoring your Railway Fund. Many other schemes relate to the re-establishment of routes that have been wholly dismantled (as a result of Beeching, or otherwise). At Sharpness, the scheme is to enhance the existing, operational, freight railway and to upgrade it for the passenger services that used to run along the line until the Severn River bridge was demolished in the 1960s.

#### 1.1.5 Developing future potential

Of particular importance in recognizing the value of re-opening the Sharpness branch line to passenger services is that this could be the catalyst for much greater levels of sustainable travel in the area.

The line originally had a south-facing chord connecting the branch to the mainline to facilitate direct trains to and from Bristol and beyond. The track bed for this chord broadly remains (it is clearly visible on aerial photographs), with only a short section and the overbridge being removed where the line crossed the A38 road. Reinstatement of this chord would therefore be straight-forward in track terms, and would require the reinstatement of the turnouts from the mainline, but would provide significant connectivity across the sub-region, allowing Sharpness to be sustainably connected directly to all of the significant economic centres in the South-west.

In addition to the above, it is also worth noting that an initial feasibility study on the potential for a Third Severn Crossing has indicated that there is an economic case for the development of rail passenger services reconnecting communities at Sharpness and Lydney via the re-instatement of a third Severn bridge and this is being explored further within the Gloucestershire Rail Investment Strategy. Such proposals could replace a rail bridge that previously connected the Forest of Dean with the eastern side of the Severn until the 1960s, when a disaster left it unusable and it was demolished.

Although this does not contemplate the provision of the southern chord, it is clear that the two schemes together – the chord and the river crossing, could be completely transformational in the connectivity of the South-west and Wales.



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In addition, the Gloucestershire 2050 Vision has also included the development of a new Lydney-Sharpness crossing of the Severn Estuary to provide a catalyst to grow the town of Lydney and to develop Sharpness from a small village to a town. It would improve links to existing transport routes through the county and create a re-energised economic centre.

The 2050 Vision is a county-wide conversation to explore ideas and shape the long-term future for Gloucestershire. It is supported by Leadership Gloucestershire (LG) and the University of Gloucestershire. LG brings together public sector organisations which allocate and spend significant resources in Gloucestershire. Its role is to provide vision, leadership and strategic direction in those areas where it is vital for organisations to work together to meet the needs of the people and communities of Gloucestershire in the most cost-effective way.

As a result of public consultation during 2018, a Concordat has now been prepared for the local authorities and other partners to sign up to which includes a vision for Gloucestershire and proposals for the development of a series of delivery boards. One of the proposed delivery boards is now focused on delivering a new Severn crossing stating it “would create stronger links between the Forest of Dean and Stroud districts, and even Gloucester, but beyond that it would connect much of England to South Wales in a new way that takes pressure off the M4 and M5. The local dividend will be the potential for new communities and economic growth based on the ambitions set out in the Vision. The Severn Vale Board should aim to seize the potential to make this part of the county not just a destination in its own right but also a new gateway to South Wales and critical to the operation of South Wales, the West of England, and the West Midlands.”

Alongside the “Glos 2050 Vision” proposals, the launch document ‘A Powerhouse for the West’ refers to a third Severn estuary crossing at Lydney / Sharpness to improve rail resilience. Gloucestershire and in particular the Severn Vale is geographically pivotal (a conduit) to the east-west and north-south connectivity of the Western Powerhouse. The Severn Vale Board therefore needs to aim to position itself to derive maximum mutual benefit for local communities and the Western Powerhouse in terms of strategic and local connectivity, prosperity, sustainable tourism and clean growth.

The ‘Powerhouse for the West’ report directly mentions the possibility of a third Severn estuary crossing at Lydney-Sharpness to improve rail resilience, given the potential risk of inundation of the Severn tunnel in the event of pump failure and the difficulties in electrifying the line that passes under the Severn. Electrification of the railway lines that link London and the different parts of the Great Western Powerhouse through to South Wales is considered important to regional economic growth and carbon reduction. Work to explore the feasibility of a rail crossing has been incorporated into the brief for the GCC Rail Investment Strategy. A rail bridge might also present an opportunity to provide better pedestrian and cycling links between existing / new communities on either side of the Severn.

The first step in delivering this economic transformation would, of course, be the reinstatement of the passenger capability on the existing branch line. That is the aim of this proposal.

## 1.2 DEVELOPMENT OF THE SCHEME

The aspiration is to make use of an existing public asset – the railway, and to regenerate its value to the local community and facilitate growth and prosperity. The railway is under-used at present, and yet represents a significant societal investment over many years to both deliver and then maintain it.



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The track is fully operational, and therefore represents a cost effective and realistic way to permit sustainable growth and development in a way that is not reliant on the private car.

The scheme knits together four core opportunities for economic growth and development in this part of Stroud:

1. Proposals by VoBR to re-introduce passenger services onto the existing Sharpness branch line to support local tourism in the more immediate term.
2. Enabling the release and development of existing employment, housing and tourism proposals at Sharpness that have currently stalled or lack sustainable forms of transport to access them, due to the lack of infrastructure in the area.
3. Support the reintroduction of twice-hourly passenger services from Sharpness to Cam/ Dursley and Gloucester railway station, providing the ability for onward journeys to Bristol and Birmingham. This service would be introduced in parallel with SDC's proposed development of a new garden village at Sharpness ('Sharpness Vale') subject to this being approved in the emerging Local Plan Review.
4. In the longer term, SDC and other authorities are exploring the potential for the development of passenger services connecting communities at Sharpness and Lydney via the re-instatement of a third Severn bridge.

### 1.2.1 Stakeholders

The following key stakeholder have been involved in the development of the proposals to date:

Stroud District Council who are promoting the scheme as a foundation of wholly sustainable growth in the district, through the delivery of the Sharpness Vale development and enhancement of the local tourism and heritage economy through the delivery of the Vale of Berkeley Railway proposals.

Siobhan Baillie MP is the local Member of Parliament for Stroud, and including the Sharpness area. She has sponsored the proposals throughout, from inception to this stage and is enthusiastic about the opportunity to deliver sustainable transportation that will reduce our carbon output and will quicken the delivery of a zero carbon agenda in the District by 2030.

The VoBR Charitable Trust is a registered charity established '*to advance the education of the public in the history and heritage of the Sharpness Railway Branch Line, by the restoration, preservation and operation of the line or any part or parts thereof including the station and associated buildings, locomotives and rolling stock as a working museum for the benefit of the public*' as a Heritage Railway. In fulfilling its charitable objective, the VoBR will in addition bring significant benefit to the area by increasing tourist footfall and extending the tourism season, as well as providing employment and leisure opportunities. It has a growing membership of 400 members, mostly drawn from the local community and sees its role as a key partner in local economic and social regeneration. It has a partnership with the Canal and River Trust, owners of the Docks, to develop a museum and historical interpretation centre for the public and works with local community organisations. These include the nearby University Technical College, a local prison and community payback organisations to provide work experience opportunities.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

### Introduction & Context

The Sharpness Development LLP is formed by GreenSquare Group <sup>1</sup>and Lioncourt Strategic Land. Formed in 2008, GreenSquare Group is a major provider of housing, regeneration, care and support and commercial services across Wiltshire, Oxfordshire and Gloucestershire. Lioncourt Strategic Land Limited forms part of The Lioncourt Group, a Worcestershire based company comprising Lioncourt Homes Limited, a five-star quality rated housebuilder and Lioncourt Strategic Land Limited, a specialist land trading company.

Network Rail who own and manage the national railway assets, including the branch line at Sharpness.

Gloucestershire County Council the transport authority for Stroud, and whose Local Transport Plan places a firm emphasis on the development of sustainable transport modes for the county.

The following stakeholders will need to be involved in the project as it progresses:

Train Operators both prospective passenger service operators and DRS, who operate the existing freight services on the line

Parish Councils comprising those in the local area: Berkley Town Council, Hinton Parish Council and Hamfallow Parish Council.

Initial engagement with the following Parish Councils has already been undertaken regarding the proposals at Sharpness Vale and will continue as the project evolves:

- Hamfallow Parish Council
- Hinton Parish Council
- Berkeley Parish Council
- Slimbridge Parish Council

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<sup>1</sup> *GreenSquare Group merged with Accord Group on 6<sup>th</sup> April 2021, and is now known as GreenSquareAccord. References to GreenSquare in the document should be taken to refer now to GreenSquare Accord. (This footnote has been added to the redacted version of this document for clarity)*





## 2.0 PERFORMANCE & BENEFITS

The project to re-open passenger services on the line will deliver economic benefits to the area through increases in tourism, heritage, housing, employment and leisure activities. Increased accessibility to the area, delivered using a sustainable mode of transport, will provide a foundation for these benefits to be accrued by a variety of public and private stakeholders. The scheme will also provide environmental benefits, and the scope for further benefits to be accrued through further infrastructure investment in the future.

### 2.1 KEY PERFORMANCE INDICATORS (KPI'S)

The success of the project will be measured through a series of indicators defined in relation to the benefits, as follows:

#### 2.1.1 Core KPI's

- 1) **Increases in Tourism spend:** The operation of the VoBR heritage railway services will be a tourism attraction in their own right, and will enhance and extend visitors stays in the Sharpness area, to the benefit of the wider tourism economy. It will also support the Canal and River Trust proposals at Sharpness Docks for new leisure and tourism provision.
- 2) **Delivery of homes through the Sharpness Vale Growth Point:** At least 5,000 new home completions will be facilitated by the project, many of which will be affordable homes, and all of which will meet the housing need of Stroud District.
- 3) **Delivery of sustainable homes:** All of the homes will be within ten minutes travel to the station, whether on foot or by cycle, personal mobility mode or local bus. At least 90% of completed homes to be within 5 minutes' walk or cycle of the station.
- 4) **Delivery of employment opportunity:** At least 10 hectares of new commercial and employment space will be created close to the heart of the development, and hence within walking distance of the proposed station at Sharpness.
- 5) **Delivery of sustainable employment space:** The employment space is located adjacent to the railway in the initial published masterplan, meaning that consideration could be given to making this facility rail connected should potential occupiers need this facility.
- 6) **Facilitate more sustainable transport for freight:** The upgraded railway infrastructure will make the route more accessible and attractive for freight train operators and commercial firms in the area to make use of railfreight. This is especially important in respect of the wide range of bulk goods activities taking place at the docks.
- 7) **Facilitate more sustainable transport for existing communities:** The new station at Sharpness will be a new station located close to existing communities at Newtown and Berkeley, providing opportunities for sustainable travel that don't currently exist.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

### Performance & Benefits

- 8) **Facilitate more sustainable transport for education facilities:** the nearby schools will be able to make use of the new passenger services to allow pupils to travel in more sustainable ways.
- 9) **Delivery of environmental benefits:** Use of the railway infrastructure will remove both private car and goods vehicle movements from the local road network, and the strategic network further afield, creating environmental benefits.
- 10) **Assistance in the regeneration of previously developed land:** Within Sharpness there is approximately 19ha of brownfield employment land that has historically failed to be developed because of the poor infrastructure at Sharpness and the lack of workforce in the immediate vicinity.

These KPI's would be monitored by reference to the following measurable criteria:

KPI	Measured by:
<b><i>Increases in Tourism spend</i></b>	Monitor establishment of heritage rail services and tourism spend in the District
<b><i>Delivery of homes through the Sharpness Vale Growth Point</i></b>	Monitor delivery against Local Plan housing trajectory
<b><i>Delivery of sustainable homes</i></b>	Monitor delivery against planning consent requirements
<b><i>Delivery of employment opportunity</i></b>	Monitor delivery against Local Plan trajectory
<b><i>Delivery of sustainable employment space</i></b>	Monitoring of requirement for sidings or facilities on rail line
<b><i>Facilitate more sustainable transport for freight</i></b>	Monitor use of line by freight trains
<b><i>Facilitate more sustainable transport for existing communities</i></b>	User surveys at station to establish locations of users
<b><i>Facilitate more sustainable transport for education facilities</i></b>	User surveys at station to establish location of users
<b><i>Delivery of environmental benefits</i></b>	Monitor road traffic volumes locally



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

### Performance & Benefits

<b><i>Regeneration of previously developed land</i></b>	Monitor delivery against planning consent requirements
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#### 2.1.2 Other measurable performance indicators:

In addition to these measurable benefits that will form KPI's for the scheme, there are a series of other potential benefits that are not directly related to the delivery of the passenger services and improved rail infrastructure, but will flow from the delivery of the scheme:

- **Quality of Homes and Neighbourhoods:** The delivery of high-quality housing at Sharpness Vale, through the Growth Point, will meet Local Plan objectives for improvements in quality of life standards.
- **Affordable Homes** – a proportion of the homes delivered at Sharpness Vale, in accordance with the Local Plan requirement and planning consent, will be affordable homes
- **Private Sector Investment:** Substantial private sector investment will be levered into development at Sharpness, for the benefit of Stroud District
- **Parks, Open Spaces and Recreation Areas:** Significant area of new or improved parks and open, publicly accessible spaces and recreation areas will be opened as a result of the Growth Point – all made sustainably accessible by the delivery of the railway link. (These will ultimately be quantified as part of any future planning consent).
- The re-opening of the railway to passenger services will act as a first step to further potential sustainable transport investments, once the line is established – the replacement of the “Southern Chord” to provide rail connections to the south from Sharpness, direct to Bristol and beyond, and the potential to re-provide a railway bridge and river crossing over the Severn to connect to Lydney and beyond once again.

The KPIs demonstrate that the investment in the railway will release development, sustainable and environmental benefits directly and create capacity for other benefits to be accrued to the benefit of the existing and new communities. Without the investment in strategic infrastructure the above KPIs could not be achieved to the same extent.

Fundamentally, an asset that is already in existence, but which is barely utilised, will remain in a critically under-utilised state, to the detriment of the local economy and environment, unless a suitably strategic level intervention is made. The latent potential for a sustainable future for Sharpness and the surrounding area should not be neglected.

This overview business case style submission sets out the benefits of such an investment, and shows that it would bring about considerable economic benefits to the area.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

### 3.0 STRATEGIC CASE – WHAT ARE WE DOING AND WHY

The strategic case of this project sets out why the re-provision of passenger rail services on the Sharpness branch line would bring a range of economic benefits in respect of heritage, tourism, local accessibility and environmental and sustainability benefits. It would also underpin the delivery of the Sharpness Growth Point proposed in the draft Stroud District Local Plan.

#### 3.1 SUMMARY OF SCHEME PROPOSALS

##### 3.1.1 VoBR Proposals

In the short term, the proposals are for the VoBR to create a heritage centre at Sharpness, as a new tourist attraction, and then to re-introduce passenger services onto the existing branch line to support local tourism for the Cotswold Edge and Severn Vale Tourism area. The proposals will establish the basic infrastructure required to allow the VoBR to operate a new heritage tourist railway attraction between Sharpness and Berkeley in the first instance, and then later along the whole length of the branch line. There would be parking facilities at Berkeley Road to allow people to access the heritage attraction from the eastern end of the line.

It is intended that VoBR services will operate during the half-hourly peak periods mainly during weekends and school holidays from March through to the end of December. The target date by which the VoBR hope to be operating on the Berkeley to Sharpness section of the line is the end of 2022.

##### 3.1.2 Sharpness Vale Proposals

Once the VoBR proposals are operational, timetabled public passenger services would become deliverable alongside the development of the mixed-use settlement at Sharpness Vale. There would be a range of land uses including significant residential and employment development that could all make use of the passenger rail services. Ultimately it is planned that a service pattern based around two trains per hour between Sharpness to Cam & Dursley and onward to Gloucester, i.e. a half-hourly service would be available during weekdays and Saturdays, with a similar or hourly service in the evenings and on Sundays dependent on demand. This will be subject to the Sharpness Vale proposal successfully being adopted within the Local Plan Review.

##### 3.1.3 Effects on existing services

The existing Sharpness branch line is currently used by Direct Rail Services (DRS) who have up to two paths a week for the transport of nuclear waste from a loading pad on a siding adjacent to the site of the former Berkeley railway station, which is located roughly halfway along the branch line. DRS advise that their existing and anticipated contracts mean that their use of the line will continue for the foreseeable future. Given the times at which the DRS trains run, the Sharpness branch line could be easily reopened for passenger services in order to facilitate sustainable growth and enhanced tourism in the area.

Given VoBR heritage rail services will operate mainly during weekends and school holidays it is considered by VoBR and Sharpness Development LLP that it will be entirely feasible to interweave the envisaged heritage services during the half-hourly operational periods.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

Preliminary discussions with Network Rail and Gloucestershire County Council have confirmed that there would be no capacity issues on the branch line itself, as it is only used by the DRS trains.

Network Rail has indicated that train paths and capacity on the mainline either side of Berkeley Road (where the branch joins the mainline) are more constrained. There are two express trains each hour, operated by Cross-Country, that use this line. These do not stop on the section between Gloucester and Bristol Parkway. There are also stopping trains that operate along the line and the timetable allows for the Cross-Country express to just catch up with the stopping services (southbound at Bristol Parkway and northbound just before the stopping service diverges towards Gloucester).

Network Rail are also of the view that, as a Sharpness branch service (heading north), would only need to use a relatively short section of the mainline track between Berkeley Road and the exit to Gloucester Station, it should be possible to feed this into the timetable either immediately following the Cross-Country Express or the stopping service. This train path would not prejudice the use of the line by other suggested proposals, as these would need to use the whole section of the line rather than being able to work around the Express services over a short section.

It is known that there are constraints at Gloucester station, as there are a number of services that use the station to turn and reverse back to the mainline. This takes more time for a stop than might otherwise be the case, and so the consideration of any service will need to ensure that it can be accommodated on the network – or what upgrades may be required to allow it to operate.

### 3.1.4 Potential future freight services

In addition to accommodating passenger services, improving the Sharpness branch line presents the opportunity for increased rail freight opportunities to and from Sharpness Docks.

The Docks currently handle general bulk and bagged cargo, animal feed, grain, fertiliser, cement, steel and coal, and there is a large metal recycling facility. These types of bulk commodities are ideal for transportation by rail. A single freight train is capable of replacing a fleet of lorries. Rail freight for bulk goods requires less manpower and energy to haul the same amount of cargo and, therefore, results in reduced transportation costs.

Transporting goods by rail also plays a big part in reducing congestion and carbon emissions. Network rail figures indicate that each freight train takes about 76 HGVs off the roads, which translates to 1.66 billion fewer HGV kilometres a year.

## 3.2 TIMETABLE MODELLING

The promoters of Sharpness Vale have recently instructed a specialist consultant, in collaboration with Network Rail, to undertake timetable modelling of the proposed passenger services between a notional new station at Sharpness (located in the heart of the proposed Sharpness Vale development), via Cam & Dursley to Gloucester station. The full output of the timetable modelling is appended to this submission (Appendix B), but is summarized below.

The modelling considered two alternatives to seek to include a half-hourly peak period service from a new station notionally located at Sharpness, and Gloucester, including a stop at Cam & Dursley to allow connections to southbound trains to Bristol and beyond:



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

- A “Do Minimum” approach – where the existing Sharpness branch line was retained in roughly its current configuration, with a maximum train speed of 25mph, and;
- A “Do Something” option – where the branch line and its signalling would be upgraded to allow passenger train services to travel at 40 / 50mph along the branch.

### 3.2.1 “Do Minimum” Option

The “Do Minimum” option was shown to not be feasible to allow a two-train per hour service to and from Gloucester. The length of time taken to transit the branch line (around 10 minutes each way) meant that the timings of the services would need to be fixed around the operations on the branch line, to allow the slow trains to pass each other. This was found to not be compatible with either the available Main Line paths or platforming at Gloucester station.

The modelling showed that it would be possible to operate a one-train per hour service, with an extended layover at Sharpness. Although this would be feasible, it would not result in a very efficient train operation, and so has been discounted for an end-state service.

This mode of operation may be helpful, however, as an initial form of service, as the development was built out and patronage and demand were growing. It would provide a potential first stage level of service if needed.

### 3.2.2 “Do Something” Option

Compared to the “Do Minimum” option, the “Do Something” option halves the journey time on the branch to around 5 minutes. This provides sufficient flexibility to align the two-trains per hour service pattern with trains on the main line, and elsewhere in terms of the timetable operations.

There would be a speed difference between the Sharpness service trains and the non-stop (CrossCountry) train services running on the main line. This combined with the need to also accommodate main line freight train paths, in both directions means that the Sharpness service paths run close to either the existing Bristol – Gloucester – Worcester train, or the proposed MetroWest path. The proposed MetroWest trains have been included in the modelling on the basis that Network Rail advised that they would also run at two-trains per hour, and would be broadly evenly distributed either side of the CrossCountry services.

Therefore, the Sharpness trains would only have around 5 – 7 minutes clearance at Cam & Dursley, rather than a 15-minute service with the existing trains.

### 3.2.3 Gloucester Station

The timetable model showed that the proposed two-trains per hour service from Sharpness could be accommodated on the branch line, and on the main line. However, there are challenges at Gloucester station.

The model can easily accommodate an additional one-train per hour service at Gloucester whether infrastructure changes are made to the Sharpness branch line or not, and including the proposed MetroWest service paths as indicated by Network Rail, and allowing for an hourly Cheltenham – Cardiff train.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

The timings for this service would remain fairly consistent across the day, although there will need to be adjustments a few minutes either way during the peak hours.

As stated, the second train can operate on the main line without any significant issues, but is then constrained by platform space at Gloucester. By the nature of its timings, the second train each hour would need to arrive at around the same time as the two London – Cheltenham trains are at Gloucester, which happens to be when platform capacity is the tightest. The model showed that the current station infrastructure might allow this train to be accommodated in some off-peak hours, but it will not be possible throughout the day without some improvements at Gloucester Station.

There are a number of upgrades that could be made at Gloucester to accommodate the second train, all related to some form of infrastructure intervention to relax the constraints. Options include a new platform or a reconfigured station throat layout. However, there is also a relatively simple solution to adjust the signalling to allow an arrival into Platform 1 in parallel with an arrival into Platform 2. This would remove the small overlap that prevents these movements currently, and it could be complemented by Network Rail's proposed scheme to provide an additional parallel move at the station (although that scheme is not essential to allow operation of the second Sharpness train if the overlap is fixed).

With the overlap resolved in the signalling, a two-train per hour service from Sharpness can be accommodated, broadly at half-hourly intervals (plus or minus five minutes or so).

### 3.3 BASIS OF PROPOSALS

There are a number of reasons which overlap and support each other in considering the re-provision of passenger services on the Sharpness Branch Line.

#### 3.3.1 Heritage & tourism

The VoBR was formed in the summer of 2013 when a group of enthusiasts, all with experience of heritage railway preservation, decided to promote a heritage railway along the existing Sharpness Branch line from Sharpness to Berkeley Road. They developed a business plan to support the venture, and established a base and engineering restoration facility in the Old Engine House within Sharpness Docks.

They have continued to work towards gaining access to the branch line with the aim of running heritage trains on the branch as soon as practicable. The VoBR has developed a phased approach to re-establishing passenger services on the line:

##### Phase 1

The aim of the first phase is to establish an operational Heritage Railway from a temporary station on the edge of Oldminster Sidings at Sharpness to the Station area at Berkeley. This would leave the line free from the DRS siding facility near Berkeley to Berkeley Road, where the mainline junction is located, to allow for the existing nuclear related train traffic operated by DRS.

At Sharpness phase one would involve the following activities:

- Establish a platform at Oldminster Sidings.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

- Building a Shed for storage of the loco, coaches & wagons at Oldminster Sidings.
- Building basic facilities at Oldminster Sidings to allow a Heritage Train operation including toilets, ticket office, watering facilities, coaling etc.
- Laying track in Oldminster Sidings connecting the shed and platform to the Sharpness branch line at Oldminster junction loop.

At Berkeley phase one would involve the following activities:

- Build a run round loop at Berkeley Pad to enable DRS trains to run round at the pad rather than travelling all the way to Oldminster junction.
- Build a platform at Berkeley Station.

### Phase 2

Once an operational heritage service was established, VoBR would look to develop the station at Sharpness, along with associated works. Their original aspiration was for this to be as close as possible to the original station from the early part of the 20<sup>th</sup> Century, but this may be superseded by the need for a modern station to cater for the regular timetabled train services that this proposal now contemplates.

This adaptation of the proposals between VoBR and the other stakeholders is necessary to allow the various parties to bring their proposals together and collaborate on the reinstatement of passenger services to Sharpness.

The delivery of the heritage service would dovetail with the other leisure and tourism assets in the area – Slimbridge Wildfowl & Wetlands Trust, the River Severn itself and others, to create a more comprehensive destination in respect of tourism activity.

### 3.3.2 Sharpness Growth Point

Sharpness Development LLP are the promoters of the proposed Sharpness Vale settlement, a sustainable and resilient growth point proposal, located on the land south and east of Newtown and Sharpness.

The site is identified in the draft Stroud District Local Plan Review Draft Plan for Consultation (November 2019) as a proposed allocation under site reference 'PS36' for a new garden community comprising:

1. 10ha mixed employment uses, to complement what already exists at and around Sharpness Docks;
2. 2,400 dwellings in the Local Plan period, by 2040, and a total of 5,000 by 2050;
3. Local centre including shops and community uses, primary school(s) and secondary school, associated community and open space uses;
4. Strategic green infrastructure and landscaping;





## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

5. Priority for walking, cycling, “micro-mobility” modes and public transport over the use of the private car including high quality pedestrian, cycle and micro-mobility routes throughout the development, bus only routes and displaced car parking;
6. The reopening of the Sharpness Branch line to passenger services, in addition to the current freight operations, including provision of a new rail station, providing direct enabling rail services to Cam and Gloucester, and onwards journeys to Bristol and the rest of the UK; and
7. Flexible and targeted bus services, utilising “Demand Responsive” services, traditional local bus routes, bespoke coach services and other emerging technologies to provide for a wide range of different journey purposes.

The scheme is intended to follow a sustainable philosophy across all aspects – and for transport this means adopting an approach to minimise the need for travel and to provide alternative modes to those that have greater environmental and social impact, such as the private car.

### 3.3.2.1 The holistic approach to transport at Sharpness

The Sharpness transport case focuses on managing movement to and from the development in the periods when the network is under greatest stress (generally the weekday morning and afternoons) and then considers how to provide for the journeys that people will need to make through a hierarchy of sustainable responses.

The hierarchy works out as follows:



1. Reduce the need to travel at all – support home working with house types that facilitate and accommodate workspaces



2. Provide links to land uses that reflect routine and regular travel patterns that are close enough to each to be easily and most reliably walked between

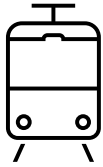


3. Provide high-quality, safe and direct infrastructure to encourage and support cycling (and the use of other developing personal modes such as E-scooters and others) for slightly longer journeys, or for trips to stations or other public transport hubs

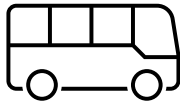


## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

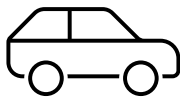
Strategic case – what are we doing and why



4. Reintroduce rail passenger services to Sharpness, as a new mode of travel to Gloucester, and beyond, and as a first-step catalyser to the recovery of wider rail services in the area



5. Provide bespoke, tailored and demand responsive services via high-quality coaches and buses that take people directly and reliably to locations where groups of people have a “common purpose” – employment, education, leisure, community activities
6. Support local bus services, and make provision for these vehicles to have priority over other longer distance modes so that they are the most direct and reliable modes for local connectivity



7. Where seats cannot justifiably be made available on other modes, only then consider the degree of highway provision that should be made. And to redress the imbalance that already exists in terms of provision for this mode, consider only making safety improvements in any event.

This approach is about redressing the balance between the car and other, more sustainable modes – but only by ensuring that all those trips that legitimately need to be made can be, or are, accommodated on the transport network as a whole.

### 3.3.2.2 The masterplan

The initial, indicative masterplan (shown below) shows how the new network of villages and communities can be configured around the railway line, with a new Sharpness station at the heart, accessible by walking, cycling, personal modes and, if necessary, by local bus services to allow travel further afield where a need cannot be met locally.



# RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why




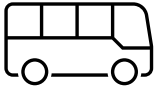

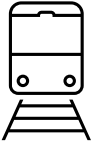

In delivering the development there will need to be incremental provision of infrastructure. This is not unusual, and is often a challenge for larger scale developments. However, experience suggests that careful planning of sequential infrastructure delivery can work, and can secure the benefits of sustainable initiatives. Hence, although the delivery of a train service will require a certain level of patronage, that will itself require a certain level of development to be completed to generate it, there are mechanisms to allow sequential provision.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

It is therefore expected that the sustainable transport provision will emerge, over time and alongside development following a series of steps:

	Infrastructure	Outline trigger
	Walking, cycling and personal mobility routes provided across the site to specified design code	Commencement
	Local bus services expanded to provide linkages into development	Early completions – c.50 homes
	Bespoke services developed – including high-quality coach services direct to Gloucester, via Cam & Dursley, to mirror the rail service	Development becoming established – c.300 – 450 homes
	First subsidised train services operate from Sharpness on limited basis – hourly, weekdays only perhaps	Mixed use centre and further amenities established, first primary school open – c.1,000 – 1,200 homes
	Train service develops to operate more services, but still subsidised – twice hourly peak service, some weekend services	Local Plan allocation nearing completion – c.2,400 homes

This document considers the way that the railway element of the plan can be delivered, and the benefits that can be secured as a result.

### 3.3.2.3 Land value uplift through development

There are recognized economic benefits related to the delivery of development generally, and the delivery of “Public Transport Oriented Development” (PTOD) in particular. Therefore, if development can be delivered in a sustainable environment, then public infrastructure investment can be justified on the basis of the economic benefits that have been seen to accrue.

This approach has been used, for example, by the Ebbsfleet Development Corporation to deliver infrastructure related to the Ebbsfleet Garden City. The significant utility investments made by



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

Government to facilitate development has been leveraged off the land value uplift, and hence the economic benefit demonstrated as a consequence of sustainable development proposals.

The same approach can be adopted at Sharpness Vale – the benefits of delivering the sustainable transport infrastructure, potentially from the public purse using initiatives such as the “Restoring your Railway” fund, would be justified if the economic benefits of development can be demonstrated to deliver value for money.

### 3.3.3 Accessibility benefits

Beyond the delivery of heritage rail and passenger rail services on the Sharpness line, the delivery of improved and upgraded rail infrastructure will have wider benefits. Although it is already a freight line, the upgrade to allow passenger services would make it easier to run freight services to the docks, as there would be better line speeds and easier access from the mainline.

Existing communities at Berkeley would benefit from railway access, and so would the new business park at the former power station site – including the education facility there which would be more accessible.

### 3.3.4 “Stepping stone” benefits

The scheme would also provide so-called “stepping stone” benefits, by acting as the first steps in re-establishing other infrastructure assets that have been lost over time in the Sharpness area.

The re-provision of the south-facing railway chord between the Sharpness branch line and the main line would allow direct services to be accommodated towards Bristol and further to the south-west. This would require further work to mainline signalling, and so would have timetabling and cost implications that would need to be investigated. However, this would increase sustainable transport in the local area.

Beyond this step, consideration could also be given to the re-provision of the bridge over the River Severn, and reinstatement of the rail services between Sharpness and Lydney, and beyond. This would be a major infrastructure investment, which would change the characteristics of the rail network in the region, with all of the consequent implications. However – the Sharpness branch re-opening to passenger services does provide a first step in realizing this possibility.

## 3.4 SCHEME DESCRIPTION

The core infrastructure work that will be required to establish passenger services on the Sharpness branch line, to meet the aspirations of VoBR and Sharpness Vale would be as set out in this section.

It should be noted that no allowance is made here for the potential to re-instate the southern facing railway chord towards Bristol, or to re-construct a bridge across the River Severn and to re-connect the east and west banks of the river with a railway link. Although the regeneration of the branch line for passenger services would go some way to facilitating this connection in the future, it is not part of the submission now being made.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

### 3.4.1 Core infrastructure & costs

The existing branch line speed is 15mph and is essentially only suitable for freight traffic. In order to allow faster passenger services to use the line, roughly 6.5km (4 miles) of track improvements will be required. The intention would be that the line speed would be increased – at least to 40mph and potentially to 60mph.

To achieve this, the core elements that would need to be delivered are understood to be as follows:

1. Construction of a suitable station at Sharpness, which would need to meet all Network Rail design requirements, and meet the aspirations of both the heritage railway and the scheduled service in terms of location and layout. This would need to be determined as part of a more detailed design process in due course.
2. Addition of a run-round loop at Berkeley to assist the existing nuclear flask trains to avoid them having to use the whole of the line to Sharpness to turn the locomotive to the front of the train.,
3. Improvements to the turnouts and signalling on the mainline at the junction with the branch line to remove the need for slow speeds and reliance on a disc shunting signal.
4. Improvements to the signalling system along the branch line to remove the need for a token system by the time scheduled train services to Gloucester commence.
5. Upgrades to the track and track bed to allow faster, smoother running by passenger rolling stock.
6. In time, as development patronage grows and a second train service can be justified, upgrades to Gloucester station will be required to accommodate it, unless these have already been delivered as a result of other improvements that we understand are being considered by Network Rail. A contingency allowance is made in this assessment to deliver this upgrade if necessary.

Although these are likely to be relatively costly pieces of infrastructure, the scheme is likely to represent significant additional value for money compared to a scheme where the track bed has been lifted, and the permanent way, structures and signalling connections have been removed.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

### 3.4.1.1 Sharpness Station

**Estimated Cost:** [REDACTED]

The station will need to be built to serve the heritage and tourism activity, and also to be within the development area at Sharpness, with the masterplan for development recognizing it as the key element of transport infrastructure to and from the new settlement. Wherever it is ultimately located, as a result of more detailed design as the proposals develop, the station would be located in a new urban square, with shops and other facilities in the same location to create both a focal point for development but also to allow rail users to most efficiently make use of the Sharpness facilities – children’s nursery, day-to-day shopping and other needs will be focused into this hub.

The configuration of the station will be very particular, and designed to ensure that the land taken by the station and the complexity of the railway required would be as efficient as possible. Two platforms are envisaged, on either side of a double-track section running through the station. One platform would sit on the through-line, and the other on a passing loop. This would allow both timetabled services to Gloucester and heritage trains to operate in a way that saw them in the station at the same time. It is not envisaged that freight services and heritage trains would operate at the same time, and so a heritage train blocking the through line is not envisaged to be an issue.

It is envisaged that the timetabled passenger services would use the platform closest to the station building, as this would enhance accessibility for mobility impaired users, who would not need to cross over the railway either on arrival or return. A pedestrian link between the platforms if this only served the heritage trains could be linked to a highway, or other structure over the railway to increase efficiency of land and infrastructure usage.

The station would be expected to have a booking office and weatherproof rooms or shelters, but retail opportunities / coffee shop and so on would be expected to be in the urban square outside. Hence, the station building would be relatively modest. Similarly, the scale of development at Sharpness Vale would not be likely to give rise to the need for trains in excess of three carriages, and so this will dictate the length of the platform required.

### 3.4.1.2 Mainline junction

**Estimated cost:** [REDACTED]

#### Station costs:

Comparators for station costs include Thanet Parkway and Reading – Green Park. Both of these are more complex, larger stations than the one that would be needed at Sharpness.

The Thanet Parkway cost includes the car park, which would not be needed at Sharpness. The Green Park scheme is on an electrified line, which adds to the complexity.

Publicly available costs are:

- Thanet Parkway - [REDACTED]
- Reading – Green Park - [REDACTED]

Other examples are:

- Warrington West - [REDACTED] (including 250 space car park)
- Maghull North - [REDACTED]
- MetroWest Phase 2 - [REDACTED] for double-track stations
- Wisbech re-opening:
  - Single platform terminus - [REDACTED]
  - Double platform terminus - [REDACTED]



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

The branch line currently has a disc shunting signal on the mainline to indicate to freight train drivers that it is safe for them to proceed into the branch from the mainline. This is appropriate as freight trains travel at much slower speeds, and the driver has time to see and respond to the signal. The turnouts on the track may well also be configured around slow speed use.

Therefore, to allow passenger trains travelling at higher speeds to use the branch line, there will need to be an upgrade to a more traditional trackside colour light signal, most likely with a junction indicator. There may also be a need to upgrade the trackwork at the branch junction if faster passenger train speeds are to be accommodated.

### 3.4.1.3 Branch line signalling

**Estimated cost:** [REDACTED]

At present, consistent with the branch line only being used about once each week, it operates on a token system. The DRS train driver collects a token from the nearest signal box, which gives them the right to occupy the branch line. This means that only one train can be on the branch at a time. In the future it would be possible for more than one train to be moving on the branch – albeit that this would end up being controlled by the locations where there were passing loops, where trains could pass each other. At present, it is envisaged that there would be a passing loop at Sharpness station, and there would also be one at the VoBR halt at Berkeley.

This would suggest that a relatively simple signalling scheme, allowing for two trains to be on the branch at any time, would need to be implemented. This is likely to be an extension of the branch entry signalling, with coloured light signals controlling exits from passing loops.

### 3.4.1.4 Track bed work

**Estimated cost:** [REDACTED]

The existing track bed has been maintained by Network Rail to accommodate the current occasional freight trains. At the moment the line is bullhead rail on wooden sleepers, some being welded rail but most of it is not. Network Rail have undertaken programmes of sleeper renewal along the line in recent years, and so the track is maintained in a fully operational state. However, NR have advised that this is likely to be at a lower level of provision than was the case when the line was being used by passenger services. It seems likely that NR (and its predecessors) have reduced the level of maintenance over time to reflect the lower speed limit that was assigned to the line when passenger

#### Mainline and signalling costs:

Comparators for mainline and signalling costs include work undertaken on the Reading – Basingstoke line some years ago, which cost [REDACTED].

#### MetroWest Phase 2:

- junction remodelling - [REDACTED]
- run-round siding - [REDACTED]

Wisbech reopening – passing loop - [REDACTED]





## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

services ceased in the sixties.

It is anticipated that this would mean that, whilst the track bed and foundations would not be expected to need significant work to return the line to passenger services, there may be a need for trackwork to be upgraded. The reinstated line would need to be re-laid with flat bottom rail to a higher specification, and founded on concrete sleepers.

This would need further liaison with NR to understand the extent of this work and the optimum means of procuring it.

In addition, the line currently does not have any passing loops, and so these would also need to be added in terms of creating the permanent way in readiness for new track. It is understood that the line was double-tracked, at least in places, in the past and hence the land take and basic level formation is anticipated to be in place to allow this work to be included in the design.

### Trackwork costs:

The “Flood and Coastal Erosion Risk Management – A Manual for Economic Appraisal”, published by the Flood Hazard Research Centre, Environment Agency, DEFRA and Middlesex University provides a guide to estimating costs of dealing with damage to rail assets. This provides a good basis for considering track bed work at Sharpness.

The guide suggests allowances of:  
[redacted] per metre for embankments  
[redacted] per metre for soil cuttings  
[redacted] per metre for rock cuttings

Wisbech re-opening – single track railway line (no existing track) - [redacted] per mile ([redacted] per linear metre)

### 3.4.1.5 Upgrades to Gloucester station

#### Contingency allowance: [redacted]

The possible need to make changes to the signals on the approach to Gloucester station has been included as a contingency allowance. It is assumed that the cost would be similar to that included for the work to the main line junction, as it amounts to improved and repositioned signalling and possible changes to turnouts near to the station. The contingency is included in the assessment as an expenditure that will be required a few years into the scheme, after the Sharpness service has become established, as it will only be required to accommodate a second service during each hour.

The sum, whilst included in the appraisal, is allowed for as a contingency as it is highly likely that work may have been undertaken to improve things at Gloucester station by the time a second Sharpness service needs to use it. It is already recognized that Gloucester station represents a constraint on the network, and so plans may come forward to improve it in advance of the Sharpness scheme.

### 3.4.1.6 Other infrastructure

VoBR have proposals to reinstate a station halt at Berkeley, as they would intend to operate heritage trains between Sharpness and Berkeley, then extending in time to Berkeley Road. The Berkeley station is likely to be a single platform halt at least initially. VoBR would like to see this expanded to a two platform layout, with a rebuilt station building as it was up to the 1930's. This would therefore be a natural focus for heritage trains, but would not be expected to be used by the scheduled services to Gloucester. In the short term this location may benefit from a passing loop in order to allow flexibility in operating both heritage and timetabled services together – but this is an issue for future detailed



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

design.

Information is awaited from Network Rail regarding the status of the bridges over the Sharpness branch line and what they are currently used for. This will enable the identification of any remedial measures that may be necessary to overcome any constraints to operation that they may represent – although none are anticipated at this stage, as they all date from a time when passenger services used the line previously. Initial desktop research and liaison with Network Rail has identified the extent of level crossings, Public Rights of Way and bridges along the line. VoBR's contacts at Network Rail have advised them that the nature of the freight traffic, with nuclear flasks, has meant that the structures along the line have been subject to a higher standard of maintenance regime in any event.

Where new bridges may be required over (or under) the operational railway line in order to facilitate connections that relate to the Sharpness Vale masterplan, then it would be expected that these would be procured and funded in the usual way by the developer. Hence, these new crossings do not form part of the considerations in this appraisal.

### 3.4.2 Train Service Proposals

#### 3.4.2.1 VoBR services

The heritage rail services that VoBR will operate will be likely to operate at times to maximise the tourism attraction – mainly at weekends and bank holidays, with some trains in school holiday periods. As the heritage railway will operate on a voluntary basis, it is not expected that there would be extensive service patterns for this use.

#### 3.4.2.2 Scheduled services

The scheduled service that will operate to Cam & Dursley and onwards to Gloucester would be expected to operate a regular service, to allow users to rely on it. But this will develop over time, as greater levels of users arise related to the completion of housing at Sharpness Vale.

Initially the service would be expected to operate on an hourly frequency in the peak periods, perhaps operating less frequently during weekdays and Saturdays initially. As patronage grew, the service would expand to operate a half hourly frequency to Gloucester during weekday peak periods and daytimes, and on Saturdays, but with an hourly, or less frequent service at night and on Sundays.

Further work, and service planning will need to be undertaken as the details of the development and rail service come forward in the future.

At this stage, it is envisaged that the full service would comprise a pattern along the following lines:

Time period	Service pattern to Gloucester, via Cam & Dursley:
<b>Weekdays</b>	



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

07:00 to 19:00	Two trains per hour each way
19:00 to 22:00	One train per hour each way
Overnight	No service
<b>Saturdays</b>	
07:00 to 18:00	Two trains per hour each way
18:00 to 23:00	No service
<b>Sundays</b>	
07:00 to 19:00	One train per hour each way
Overnight	No service

### 3.4.2.3 Other destinations

Scheduled services running from Sharpness to Gloucester, via a stop at Cam & Dursley, could form part of a longer service that continued onwards from Gloucester. This has not been considered in the timetable modelling undertaken or this appraisal at this stage, and would essentially be an issue for the train operator at the time to determine alongside their usual scheduling activities.

### 3.4.3 Phased introduction

The reintroduction of the passenger services at Sharpness can be phased, reflecting the quicker timeframes of establishing the heritage operations before the timetabled services come along later, as the development opportunity is built out in future years,

#### 3.4.3.1 First Phase – getting the heritage railway up and running

In the immediate term, VoBR's secured site at Oldminster Sidings is their initial operational base. It will provide safe and secure covered accommodation for all rolling stock and other maintenance facilities. If VoBR then receives the lease to the branch in 2020, as currently anticipated, they would expect to be able to run heritage steam tourist services within 18 months.

This will require some rebuilding and upgrading of the existing track layout and as soon as platforms are completed and operational at Newtown and Berkeley, VoBR would begin to work with rail providers such as GWR to consider the requirements for providing services onto and from the mainline.

Hence, VoBR's immediate plans are to replace platforms at Sharpness and Berkeley in order to run a heritage service between them. At Berkeley Station the previous station halt platform on the southern side of the line will be restored, and at Sharpness, there will be a new platform on the footprint of the original Sharpness Station, adjacent to present day Newtown, so that passengers can board and leave trains at Berkeley and Newtown stations.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

The Sharpness station would almost certainly then be relocated to match the optimum location within development as the Sharpness Vale proposals came forward. This is subject to final master planning and planning consent steps.

The costs of rebuilding the two platforms using VoBR labour were originally anticipated to be around £200,000 but this is now considered to be an optimistic estimate! In any event, the delivery of this infrastructure would be accelerated by the use of contractors.

VoBR also propose construction of a new track layout arrangement to provide a passing loop at Berkeley. This would allow then allow the DRS trains serving the Berkeley siding and nuclear flask facility there to turn the train more efficiently. This would release the line westwards to Sharpness for VoBR use as a heritage railway in the first instance, and help later on to dovetail passenger services with the continuing freight operations.

This represents Phase One of the strategy and has been agreed in principle with DRS. The intention is for work on this project to begin immediately on receipt of the lease to the line from Network Rail. VoBR continue to work with Network Rail at present to deliver the relevant approvals and other processes that need to be completed to set the scene for this work to go ahead.

VoBR already occupies the former Sharpness Docks exchange sidings site at the end of the branch line under licence from Network Rail. This is planned to be the operational base for the VoBR, replacing the current facility in Sharpness Docks. It provides sufficient space for carriage and locomotive maintenance and the stabling of other rolling stock that might be provided for public use. There is also space at the Berkeley Station site that could be used for this purpose.

VoBR has met with the railway regulator (the Office of Rail and Road – ORR) and are preparing the comprehensive Safety Management System that the ORR require to be in place before granting either a Licence or Licence Exemption as appropriate, which will allow the VoBR to commence railway operations in line with its target of the end of 2022.

SDC also granted a “Certificate of Lawfulness” in December 2019 which allows the VoBR, as a Railway Undertaker, to develop those parts of the branch line covered by the certificate without the need to obtain individual planning consents.

### **3.4.3.2 Second Phase – developing the tourism offer**

The second phase would revolve around the development of a stronger tourism and heritage offer at Berkeley. More comprehensive proposals at Berkeley Station would create a new amenity for the town, with the opportunity for both tourism and some timetabled services to then offer a service to residents and businesses at Berkeley. VoBR’s proposals therefore incorporate rebuilding the attractive station building (estimated costs of around £1.5m), which will provide visitors with a café, waiting room and other facilities.

As this station could be focused on the heritage and tourism aspects of the line, if some timetabled services stopped there it would provide a significant gateway to the wider tourist attractions and economy of the area.

There may be the potential to also provide a heritage / tourism related station halt closer to the junction with the main Bristol – Birmingham line at Berkeley Road. This would be investigated by



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

VoBR once their heritage services were established, and so is not part of the proposals at this stage. However – it is noted here as there is nothing that is proposed in this submission that would preclude such a provision in the future.

### 3.4.3.3 Third phase – Sharpness Vale

In respect of the Sharpness Vale development, this would revolve around the reopening of passenger services to the burgeoning development as soon as this was practicable. The preference is to enable a direct service through to Gloucester, with an intermediate stop at Cam & Dursley to both improve services there, and provide connections southwards for connections to Bristol and beyond.

The timetable modelling work outlined above describes how this would operate.

By the time trains began to operate the core infrastructure work would need to have been undertaken, and be available for use.

In addition, discussions with Network Rail have also indicated that platform capacity at Gloucester Station is limited as a result of signalling and track configuration. Although the platforms are very long, they only have a single signal and so multiple services cannot use each platform. Network Rail are already undertaking modelling work associated with the re-signalling of lines around Gloucester Station, and it is expected that this issue would have been resolved by the time that any Sharpness service needed to use the station.

Network Rail have also indicated that it may be possible to provide a bay platform at Gloucester Station using the old mail siding to the rear of the Station. Such provision could be beneficial to the Metro West stopping service and the Sharpness service, and maybe others as well, and could be considered as a strategic improvement, with the potential to pass through and head on to the Forest of Dean and South Wales.

### 3.4.3.4 Fourth phase – Gloucester Station

If required, upgrade work to the approaches to Gloucester Station would be undertaken as a final phase of the work, if it had not already been resolved as part of Network Rail's investment in dealing with network constraints. The appraisal spreadsheet model allows for this contingency to be required around ten years into the development of the Sharpness service.

## 3.4.4 Basis of a collaborative approach

As the railway re-use project develops over time, and assuming that the Sharpness Vale proposals are confirmed in the emerging Local Plan, Sharpness Development LLP and VoBR have agreed that they will work together to provide supporting information to the authorities to allow public funding bids, from relevant sources, to be lodged. In addition to support from the Restoring your Railway process, it is expected that bids via the Gloucestershire LEP for strategic transport improvements will be investigated as well as the Housing Infrastructure Fund. There is also the potential for Network Rail contributions in respect of betterment of their asset and potential operator investment, which will need to be investigated in time.

VoBR already has in their possession many of the physical resources needed to build and operate the heritage railway, such as trackwork, carriages and locomotives.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

On the basis that the development at Sharpness Vale will form a long-term growth point for the District, at a strategic level, it is envisaged that strategic infrastructure delivery will be managed by the local authorities, using funds from public sources and developer contributions.

### 3.4.5 Testing deliverability

The approach to restoring the passenger services at Sharpness has been undertaken in a sequential fashion, recognizing that it was first important to understand how the asset owner (Network Rail) viewed the opportunity and potential of the scheme, and then to establish that there was capacity in the timetable to accommodate such a service.

It was recognized, following preliminary discussions with Network Rail, that infrastructure upgrade work would be required to allow the line to be used for scheduled passenger services again. But, on the basis that this had been done before, this was not seen as a critical path issue compared to the need to understand if the timetable could accommodate the service.

As the timetable modelling has now been completed, and it demonstrates that the service can be included as envisaged, with works to the branch line and some upgrades at Gloucester station, it is now considered timely to engage with the Restoring your Railway fund bidding process, with a proposal that can be delivered.

## 3.5 POTENTIAL PATRONAGE

More detailed work and modelling will need to be undertaken in respect of establishing the patronage for the new scheduled services as the scheme becomes more established. However, some preliminary work has been done to consider the proportions of trips from the existing community and the new development at Sharpness Vale that might be expected to make use of the service.

The forecasts for peak period rail trips has been considered in Stantec's "Sharpness Vale – Transport Technical Appraisal – June 2020" document. This takes forecasts of person trips from the development and existing community, examines the proportions that would head towards destinations that would be served by the railway – predominantly Gloucester and Cam & Dursley, with a minority of trips towards Bristol who might change at Cam & Dursley. This provides a forecast of potential train users.

The complete analysis is set out in that report, but the outputs are summarized below.

### 3.5.1 Assessing rail patronage demands

It should be noted that this is an assessment of the likely propensity for people to choose the rail mode from the outset, rather than the level of usage that would arise if proactive travel behaviour change measures (MaaS, travel planning etc) were successful in moving people from the private car to the train mode. Hence the actual demand could be higher.

In addition, as the station and passenger services would be a wholly new public transport provision into the area, it would be expected that a proportion of existing residents would also take advantage of the service and start to use the train. This has also been assessed below.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

It is also possible that some people working in the area (at the docks or existing employment areas) may choose to use the train to get to work once the service was available. This is difficult to assess, as there is no reliable information available to assess where these people live, and hence whether the rail mode would be viable for them. As a result, no allowance has been made in the assessment below for these trips.

Finally – there would also be a potential for people visiting the area – either to enjoy the amenity, to visit family or for leisure purposes to use the train. Again, these are difficult to assess, although they could be expected to be modest in number and so they have been omitted for the purposes of this assessment.

### 3.5.2 Demand from Sharpness Vale

The peak period passenger demand from the completed Sharpness Vale development is assessed to be as follows:

	Morning Peak (8am to 9am)			Evening Peak (5pm to 6pm)		
	Arr.	Dep.	Tot.	Arr.	Dep.	Tot.
Gloucester	38	113	152	103	55	158
Cheltenham	2	6	9	6	3	10
Tewkesbury	1	4	5	5	2	7
Bristol	14	44	57	43	22	65
South Gloucestershire	21	62	84	61	33	94
<b>Total</b>	<b>77</b>	<b>229</b>	<b>306</b>	<b>218</b>	<b>116</b>	<b>335</b>

### 3.5.3 Demand from Berkeley, Sharpness and surrounding settlements

The existing community that could use the train service will be comprised of both the households contained within the local area, and those from development that is committed already or likely to come forward. This suggests that, by the time the Sharpness Vale development is complete, the existing community would include some 3,205 households.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

For the peak period passenger demand from the existing community, a modest 3% mode share has been applied to make an allowance for existing household trips that would choose to take advantage of the train service:

	Morning Peak (8am to 9am)			Evening Peak (5pm to 6pm)		
	Arr.	Dep.	Tot.	Arr.	Dep.	Tot.
<b>Person Trip Rates</b>						
Residential	0.176	0.732	0.908	0.564	0.248	0.812
<b>Person Trip Generation</b>						
Person Trip Generation (3,205 dwellings)	564	2,346	2,910	1,808	795	2,602
Rail Trips (3% mode share)	17	70	87	54	24	78
<b>Rail Trips by Destination</b>						
Gloucester	8	34	42	26	12	38
Cheltenham	0	2	3	2	1	2
Tewkesbury	0	1	2	1	0	1
Bristol	3	13	17	10	5	15
South Gloucestershire	5	20	24	15	7	22
<b>Total</b>	<b>17</b>	<b>70</b>	<b>87</b>	<b>54</b>	<b>24</b>	<b>78</b>

### 3.5.4 Total Demand

The total demand would therefore comprise:





## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

	Morning Peak (8am to 9am)			Evening Peak (5pm to 6pm)		
	Arr.	Dep.	Tot.	Arr.	Dep.	Tot.
Gloucester	46	147	194	129	67	196
Cheltenham	3	8	11	8	4	12
Tewkesbury	2	5	7	6	3	8
Bristol	17	57	74	54	27	80
South Gloucestershire	26	82	108	76	40	116
<b>Total</b>	<b>94</b>	<b>300</b>	<b>393</b>	<b>273</b>	<b>140</b>	<b>413</b>

A passenger demand of c.300 passengers in the morning peak period would represent two 2-car trains, with some allowance for passengers to be standing in the peak period.

It would be expected that the peak period demand would equate to 15 – 20% of the daily demand, and so the daily demand can be estimated to be of the order of 4,000 passengers per day, on a typical weekday, or around 22,500 passengers per week, and potentially around 1,000,000 passenger journeys arising from the Sharpness station each year.

### 3.6 REASONS FOR INTERVENTION

There are a number of reasons why intervention is important, as failure to invest in the latent potential of the existing railway asset would mean a number of consequential losses in benefit:

Risk	Effect	Likelihood	Impact	Level of risk
Potential value of VoBR in joining up heritage and tourism opportunity is lost.	Tourism spend in the area is reduced, and VoBR takes long to become established	Very likely	Medium	High
Sharpness Growth Point development is less sustainable	Developers may be deterred from investing in the area, reducing value of land. Residents are more reliant on the private car, meaning	Very Likely	High	Very high



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

	investment is required in highway works.			
Development at Sharpness happens in a piecemeal way, rather than as a planned and coordinated Growth Point	<p>Stroud DC has to release other areas of land for development in the short term.</p> <p>The advantages of scale that come with a growth point are lost.</p> <p>The local living agenda, linking employment and residential development at Sharpness is lost.</p>	Likely	Medium	Medium
Land-side freight movement related to Sharpness Docks would be most likely to remain as an entirely road haulage-based operation	The social and environmental consequences and impacts of heavy goods vehicle traffic would continue to be felt on the local and strategic road network.	Likely	Low	Medium
The railway asset will degrade and may ultimately be lost altogether, as it is completely reliant on a single, occasional user at present	The nuclear related trips are intended to continue for many years, but it may be possible to make these trips in a different way in the future. If this traffic finished, the line would immediately fall into disuse, and it is unlikely that Network Rail would maintain it as a non-operational asset.	Possible	High	Medium
Opportunity to travel to leisure activities and existing communities by sustainable modes is significantly reduced	It is already known that local bus services in the Sharpness, Newtown and Berkeley area are marginal at present, due to extended journey times to key destinations. Without investment in the railway it is likely that these communities would be left with no sustainable public transport provision at all.	Very likely	High	High
Environmental benefits of sustainable travel would be lost	The opportunity to reduce both car and lorry mileage associated with trips into and out of the Newtown, Sharpness and Berkeley areas would be lost. The area would be entirely dependent on the private car and road-based haulage and transport.	Likely	High	Medium



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

<p>Future asset development opportunities will be much less attractive or feasible.</p>	<p>The re-opening of the Sharpness branch line to passenger services could be the catalyst for re-consideration of the replacement of the south facing chord towards Bristol and the re-instatement of a River Severn rail crossing. Although these would be significant projects in their own right, failure to secure the best future for the existing branch line would undermine the likelihood that these schemes could even be considered again in the future.</p>	<p>Very likely</p>	<p>Medium</p>	<p>Medium</p>
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It can be concluded that intervention is required in order to address the above issues and ensure that the potential benefits of the project can be realized.

### 3.7 OBJECTIVES

The objectives of the project are therefore to:

- Provide enhanced sustainable transport infrastructure to the Sharpness area
- Provide a suitable railway infrastructure to allow the VoBR to operate heritage passenger services in the area, linked to other tourism activities in the area – particularly maintaining the connection to their facilities and heritage base at Sharpness, the new station at Berkeley and ultimately allowing for a halt at Berkeley Road, close to the main line.
- Upgrade the existing railway line trackwork and signalling to allow passenger services to operate with reasonable frequency and headways.
- Upgrade the connection to the mainline at Berkeley Road to allow higher speed passenger trains to access the line, without the need for a token from the signalman
- Maintain the same level of service provision for existing freight traffic on the line, and provide an enhanced opportunity to use the line for freight purposes, with run-round facilities at the northern end of the line close to Sharpness Docks and the potential for rail-connected development.
- Develop a new fully-accessible station at Sharpness, with suitable facilities to cater for the demands of the Sharpness Growth Point development.
- Stimulate the regeneration of existing brownfield employment sites at Sharpness.
- Assist in the delivery of a zero carbon agenda for the District by 2030.

### 3.8 OPTION ASSESSMENT

As part of the Local Plan process, the Council has considered a series of growth options, and has assessed these using its Sustainability Assessment. This process considered a range of development options for the District, and concluded that the Sharpness Growth Point, with the enhancements to the railway service to re-introduce passenger services would represent the most sustainable growth proposition for the District.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

However – options can also be considered in respect of how the sustainable transport solution would be provided for the area. The table below summarises the options that could be considered, and the preferred option is shaded for ease of reference:

Intervention scenario	Strategic Fit	Achievability	Acceptability	Affordability / Risk
Do Nothing / Do Minimum	<p>Tourism and heritage opportunities only come forward organically and reliant on small scale, occasional investments.</p> <p>Growth Point can only be promoted on the basis of current transport infrastructure – likely to be road based.</p> <p>No environmental benefits would be achieved.</p> <p>Sharpness area accessibility remains at a low level, with consequent lack of investment – especially in employment.</p> <p>Stroud housing need has to be made in other, smaller scale locations; economies of scale are lost.</p>	<p>VoBR has a supporter base, who will fund improvements over time – but delivery will be uncertain over an undefined programme “as resources allow”.</p> <p>Highway network constraints would need to be tackled.</p> <p>Housing need can be met, but only on smaller scale sites.</p>	<p>Heritage and tourism benefits to the area will be lower, and VoBR has less leverage to achieve its objectives.</p> <p>Highway based growth strategy is not consistent with sustainability and environmental aspirations.</p>	<p>Affordable, as no intervention is required to support heritage and tourism – private investors take any risk.</p> <p>Highway infrastructure likely to require some investment – by developer and local authority. This is achievable, but would reduce funds that could otherwise be targeted at sustainable measures.</p>



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

Intervention scenario	Strategic Fit	Achievability	Acceptability	Affordability / Risk
Intervention Scenario – Bus based development strategy	<p>Tourism and heritage opportunities only come forward organically and reliant on small scale, occasional investments.</p> <p>Growth Point can only be promoted on the basis of current transport infrastructure – likely to be road based.</p> <p>No environmental benefits would be achieved.</p> <p>Sharpness area accessibility can only be improved organically based on opportunities for extension of local bus services as development activity occurs.</p> <p>Increased pressure on the local highway network, with consequent requirements to upgrade highway infrastructure.</p> <p>Stroud housing need may only be able to be met at a slower pace, economies of scale are lost.</p>	<p>VoBR has a supporter base, who will fund improvements over time – but delivery will be uncertain over an undefined programme “as resources allow”.</p> <p>Highway network constraints would need to be tackled, and third-party land may be required.</p> <p>A “traditional” developer led approach to infrastructure delivery would be slower.</p> <p>Housing need can be met, but only on smaller scale sites.</p>	<p>Heritage and tourism benefits to the area will be lower, and VoBR has less leverage to achieve its objectives.</p> <p>Highway based growth strategy is not consistent with sustainability and environmental aspirations.</p> <p>Distance to the A38 via bus creates longer journey times, which are less attractive.</p>	<p>Affordable, as no intervention is required to support heritage and tourism – private investors take any risk.</p> <p>Highway infrastructure likely to require some investment – by developer and local authority. This is achievable, but would reduce funds that could otherwise be targeted at sustainable measures.</p>



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

Intervention scenario	Strategic Fit	Achievability	Acceptability	Affordability / Risk
<p>Intervention Scenario –</p> <p>Utilise existing rail track – link to Cam &amp; Dursley only</p>	<p>Tourism and heritage opportunities can be delivered as planned.</p> <p>Growth Point would be promoted on the basis of a service to Cam &amp; Dursley, with users then changing to mainline services to continue their journeys north and south. Some patronage would be lost compared to a direct service to Gloucester.</p> <p>Sharpness Vale growth can come forward, but greater mitigation schemes for public transport (coaches and buses) and highways would need to be delivered as well.</p> <p>Some environmental benefits would be achieved.</p> <p>Some additional pressure on the local highway network, with consequent requirements to upgrade highway infrastructure.</p> <p>Stroud housing need may only be able to be met at a slower pace, economies of scale may be reduced.</p> <p>Assists in future case for south-facing chord and Severn bridge.</p>	<p>VoBR would achieve its objectives over time, using its own resources.</p> <p>The railway would require some upgrades, and it is unclear if activity would be sufficient to support this investment.</p> <p>Highway network constraints would need to be tackled, and this should be possible within the highway land available.</p> <p>Some environmental benefits would be achieved at a local level.</p> <p>Phasing of infrastructure delivery would be harder to plan, and the capital investment in the railway would have to sit alongside other mitigation and upgrade works.</p> <p>Housing need likely to be met over time.</p>	<p>Heritage and tourism benefits to the area achieved.</p> <p>The future of the Sharpness branch, with passenger services on it would be clearer. But service attractiveness would not secure it firmly.</p> <p>Sustainability of proposals are more marginal, as the choice between public transport and car-based travel would be less positive.</p>	<p>Affordable, as no intervention is required to support heritage and tourism – private investors take any risk.</p> <p>Affordability of limited rail service, with requirements to deliver capital to both rail and road infrastructure makes this option harder to achieve in affordability terms.</p> <p>Development pace may be slower, and benefits may not accrue.</p>



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

Intervention scenario	Strategic Fit	Achievability	Acceptability	Affordability / Risk
<p>Intervention Scenario – Upgrade railway to re-introduce passenger services</p>	<p>Tourism and heritage opportunities can be delivered as planned.</p> <p>Growth Point would be promoted on the basis of a service to Gloucester, with an expectation that this would skew work trips towards this destination compared with today due to ease of access.</p> <p>Cam &amp; Dursley change remains for users to access destinations to the south.</p> <p>Sharpness Vale growth can come forward.</p> <p>Measurable environmental benefits would be achieved.</p> <p>Stroud housing need should be met.</p> <p>Opportunities for further asset development are created.</p>	<p>VoBR would achieve its objectives.</p> <p>The railway would require substantial upgrades, and this would be likely to require public sector investment, but with tangible value for money benefits.</p> <p>Highway network constraints could still be tackled in the usual way alongside development.</p> <p>Housing need likely to be met over time.</p>	<p>Heritage and tourism benefits to the area achieved.</p> <p>The future of the Sharpness branch, with passenger services on it should be secured for the foreseeable future.</p> <p>Sharpness Vale proposals can be considered as substantial sustainable development at a new growth point.</p>	<p>Long-term public asset investment opportunity, but with support from developer contributions and other sources as the scheme comes forward.</p> <p>Would need public and private sector parties to work together to achieve the best outcome.</p>



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

Intervention scenario	Strategic Fit	Achievability	Acceptability	Affordability / Risk
<p>Intervention Scenario – Upgrade railway to re-introduce passenger services AND provide south-facing chord towards Bristol</p>	<p>Tourism and heritage opportunities can be delivered as planned.</p> <p>Growth Point would be promoted on the basis of direct services to Gloucester and Bristol and beyond, with an expectation that this would deliver considerable opportunities for sustainable travel.</p> <p>Sharpness Vale growth can come forward with greater speed and sustainable access.</p> <p>Significant environmental benefits would be achieved – there may be some local impacts of construction.</p> <p>Stroud housing need should be met.</p> <p>Opportunities for further asset development are created.</p>	<p>VoBR would achieve its objectives.</p> <p>The railway would require substantial upgrades, and recovery of land disposed of. A TW&amp;A Order would be required, with consequent programme and timing implications.</p> <p>Certainty that this would need to be a public sector investment</p> <p>Housing need likely to be met over time.</p>	<p>Heritage and tourism benefits to the area achieved.</p> <p>The future of the Sharpness branch, with passenger services on it should be secured for the foreseeable future.</p> <p>Sharpness Vale proposals can be considered as substantial sustainable development at a new growth point.</p>	<p>Long-term public asset investment opportunity, but with support from developer contributions and other sources as the scheme comes forward.</p> <p>Would need public and private sector parties to work together to achieve the best outcome.</p> <p>Uncertain whether trains north and south from the branch line could be accommodated on the mainline.</p>





## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

Intervention scenario	Strategic Fit	Achievability	Acceptability	Affordability / Risk
<p>Intervention Scenario – Upgrade railway to re-introduce passenger services AND provide south-facing chord towards Bristol AND NEW River Severn Crossing</p>	<p>Tourism and heritage opportunities may be difficult to deliver if there were “through trains” on the branch line – capacity would be more stretched.</p> <p>Growth Point would become a potentially more significant urban settlement on the railway.</p> <p>Ultimately, Sharpness Vale growth may be impacted by the timescale requirements to promote this scheme, which would be extensive. Development could be phased, but there would be uncertainty about ultimate outcomes.</p> <p>Regional environmental benefits would be achieved in transport terms – but impacts of construction would need to be considered.</p> <p>Stroud housing need should be met.</p> <p>National Rail network would be enhanced, with greater permeability.</p>	<p>VoBR may be unable to achieve its objectives.</p> <p>This would be project of National significance, and would need substantial political and strategic weight behind it to come forward. A DCO, using the NSIP process would be required – the programme would be likely to be more than a decade as a minimum.</p> <p>This proposal is not within the remit of Stroud DC or the Sharpness Vale promoter to deliver.</p> <p>Government funding would be required, and this would need to be set alongside other such schemes and the way that railway franchising was progressing in this area and nationally.</p> <p>Certainty that this would need to be a public sector investment</p>	<p>Heritage and tourism benefits to the area unlikely to be achieved.</p> <p>The future of the Sharpness branch, with passenger services on it should be secured for the foreseeable future.</p> <p>Sharpness Vale proposals can be considered as substantial sustainable development at a new growth point.</p> <p>Timescale implications mean that this would change the scope and nature of allocation for the Local Plan.</p>	<p>Long-term public asset investment opportunity, requiring considerable National level initiative to deliver. None of this process is, as yet, underway.</p> <p>Public finance implications.</p> <p>Very high costs, and considerable evidence of benefits would be required to support the idea.</p>



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

### 3.8.1 Examples of rail re-provision precedents and similar schemes

There are numerous examples of locations where branch lines have been re-opened, often to support growth and development aspirations. In addition, there are an increasing number of places where similar proposals to the Sharpness example are being put forward and funding approval for studies and further work has been undertaken.

The following are all examples of schemes where closures that were made under the rationalization of the rail network in the Sixties (“Beeching” cuts) have been reversed, and the lines reinstated (there are many more schemes than this, this list concentrates on lines with similar characteristics to those that would exist at Sharpness):

- The Chiltern Main Line was redoubled in two stages between 1998 and 2002, between Princes Risborough and Aynho Junction.
- The Romsey to Eastleigh link, closed to regular passenger services in 1969, reopened in 2003 along with the intermediate station at Chandler's Ford in Hampshire.
- Services on the London to Aylesbury Line were extended north along the former Great Central Main Line (closed in 1966) to a new station called Aylesbury Vale Parkway, which opened in December 2008.
- In the South-west, stations reopened include Ashchurch, Cam and Dursley, Feniton, Pinhoe, Templecombe and Yate,
- Regular passenger services between Yeovil Junction and Yeovil Pen Mill were withdrawn in 1968; a limited service was reinstated in 2015 and has since slowly increased.
- The Robin Hood Line in Nottinghamshire, between Nottingham and Worksop via Mansfield, reopened in the early 1990s. Since closure in 1964 Mansfield had been the largest town in Britain without a rail link.
- The Kettering to Oakham Line via Corby closed to passengers on 18 April 1966. A shuttle service between Kettering and Corby was introduced in 1987, but the service was unreliable and lost funding support from the local council, leading to its closure in 1990. The line was then reopened on 23 February 2009 with Corby served by direct trains to London and a limited number of trains continuing on towards Oakham and Melton Mowbray.
- The Cotswold Line has been redoubled in places and Honeybourne station reopened.
- Coleshill closed in 1968 was rebuilt and reopened in 2007.
- The line from Wakefield Kirkgate to Pontefract Monkhill closed in 1967 was reopened in 1992 with Pontefract Tanshelf and two new stations.
- Line from Sunderland to South Hylton closed in 1964 was rebuilt and reopened in 2002 as part of the Tyne and Wear Metro.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

- The Merseyrail line from Liverpool Central to Hunts Cross was closed in 1972 and mainly reopened in 1978.
- 32 new stations and four lines reopened within 20 miles (32 km) of each other: Abercynon–Aberdare, Barry–Bridgend via Llantwit Major, Bridgend–Maesteg and the Ebbw Valley Railway via Newbridge.
- Penally closed in 1964 and reopened in 1972, and Sugar Loaf closed in 1965 and reopened in 1984. Fishguard and Goodwick, which closed for regular passenger services in 1964, reopened in 2012.
- The Argyle Line was extended in December 2005 when a four-mile (6.4 km) section of the Mid Lanark Lines of the Caledonian Railway reopened, serving Chatelherault, Merryton and Larkhall.[1]
- The Glasgow and South Western Railway's Paisley Canal line was closed to passengers in 1983. The majority of the route reopened in 1990.
- The Caledonian Railway's Rutherglen and Coatbridge Railway closed to passengers in 1964. The majority of the route was reopened (with a revised terminus station at Whifflet) in 1993.
- Stirling to Alloa reopened on 19 May 2008, providing a passenger service to Alloa on the route of the former Stirling-Dunfermline main line after a 40-year gap. The restored line also provides for freight onwards to Kincardine, and ultimately to Dunfermline by the slower, single track coastal route.

In addition to these, the following are schemes that have been awarded business case funding as a result of the first round of the Restoring your Railway bid process. The schemes that have similarities to Sharpness are in bold, with a commentary on the reason they are similar:

- reopening Meir station near Longton on the Stoke-on-Trent – Derby line;
- providing regular passenger services on the Barrow Hill line between Sheffield and Chesterfield via Beighton;
- ***reintroducing passenger services on the Leicester – Coalville – Burton upon Trent ‘Ivanhoe’ line (Like Sharpness, this line currently exists as an operational line, but is only used by slow-speed freight services);***
- provision of a passing loop to enable a more frequent service to be provided on the St Albans Abbey – Watford Junction ‘Abbey’ line;
- reopening stations at Wellington in Somerset and Cullompton in Devon on the Taunton – Exeter main line;
- ***introducing passenger services on the Bury – Heywood – Rochdale line, most of which is operated as the heritage East Lancashire Railway. This route had also been identified by Transport for Greater Manchester in 2019 for a possible tram-***



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

***train trial (like Sharpness, this line is currently operated partially as a heritage railway – East Lancashire Railway);***

- extending the Blackburn – Clitheroe passenger service from Clitheroe to Hellifield to link with the Leeds – Carlisle route;
- building a new parkway station at Lydeaway to serve Devizes;
- ***reinstating passenger services on the Totton – Fawley branch in Hampshire, branded the Waterside Line (like Sharpness, this would see the reinstatement of passenger services on an existing freight only branch line);***
- extension of the Island Line south from Shanklin to Wroxall and Ventnor; and integration with the existing Isle of Wight Steam Railway to provide passenger services from Ryde to Newport. Welcoming the funding, the island’s MP Bob Seely said the heritage railway supported the studies, but he cautioned ‘we must also be realistic about the logistical challenges we face in seeing these routes restored’.

### 3.9 STAKEHOLDER ISSUES

It is understood that further stakeholder engagement will be required as the scheme progresses, and so the table below seeks to define the areas where particular liaison will be necessary. This table starts to identify the specialist areas of interest and risk areas that are relevant to particular stakeholders:

#### 3.9.1 Risks for Stakeholders

##### Key Risks

Risk	Affects
Growth Point can't be developed in a coordinated way	Sharpness Development LLP Stroud DC
Tourism and heritage scheme is delayed	VoBR Stroud DC Parishes
Service can't be delivered without significant timetable changes	Network Rail TOC's BNFL / DRS



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

Strategic case – what are we doing and why

Nuclear traffic needs to increase	Network Rail BNFL / DRS
Capital costs increase	Stroud DC Sharpness development LLP
Issues arising from increased rail traffic	Stroud DC Town & Parish Councils

### 3.9.2 Dependencies and Constraints

At this early stage of the scheme development, the full list of dependencies and constraints has not been developed, but there are likely to be a number of them that will need to be managed alongside the design and development of the project:

- VoBR may have access to grant funds or fundraising programmes related to their charitable status, and aspirations into the tourism and heritage sectors
- Local Plan – the inclusion of Sharpness Vale as a growth point in the Local Plan, and its subsequent adoption will be fundamental to the scheme, as the two projects are co-dependent
- GWR franchise and timetabling issues
- South-west Metro implications, and the wider aspirations for the development of rail services in the area
- Fare box requirements and affordability for users

The core constraints that apply to the re-introduction of passenger services on the Sharpness branch line relate to the operation of the railway:

- DRS nuclear flask service requirements
- Interaction between VoBR and development service requirements
- Gloucester signalling work and requirements
- Timetabling constraints
- Deliverability and phasing of implementation
- The reduction in patronage of public transport following the COVID19 Pandemic



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

FINANCIAL CASE - How much it will cost, and how it will be funded

### 4.0 FINANCIAL CASE - HOW MUCH IT WILL COST, AND HOW IT WILL BE FUNDED

Although the analysis that has been undertaken to support this more detailed submission to the Restoring your Railway fund programme is in the style of a business case, at this stage it represents an overview business case appraisal rather than one that is fully compliant with HM Treasury's "Green Book" appraisal process. This is because the scheme is at an early stage, and further work remains to be done – but, nevertheless, sufficient information is available to provide a robust and realistic overview assessment of the case for the Sharpness branch line re-opening.

The appraisal set out below omits some of the quantifiable benefits at this stage, as the supporting work is not yet available to include this, and it takes a comparative approach to establishing costs for the scheme based on information and experience of other similar projects. Cost estimates have routinely been selected at the higher end of the evidence provided by other case studies, and a healthy and robust allowance for optimism bias has also been applied.

Therefore, the overall outcome is considered to be appropriately representative of the case for re-opening the Sharpness branch line.

#### 4.1 COSTS

Costs have been derived based on the case studies and prior experience set out in the preceding sections, and allowances are then made for the capital costs and potential operational subsidy that may be required to allow the service to become established alongside the development at Sharpness Vale as it builds out. Further work will need to be done to understand the trajectory of housing delivery alongside the railway, but for the purposes of this appraisal, it is assumed that the railway would be delivered towards the beginning of the development process, and that subsidies to operational costs would be required, on a declining basis, for fifteen years after opening.

Costs have been derived as allowances for each phase of the work, and then apportioned to take account of different stages of delivery – planning and design, construction and contingencies.

##### 4.1.1 Cost allowances by phase

The following allowances have been made for each phase of the delivery of the project:

Phase	Cost allowance
<i>First phase - establishing the Heritage railway</i>	██████████
<i>Second phase - developing the tourism offer - Berkeley Station Halt</i>	██████████
<i>Mainline junction works (turnouts and signalling improvements to allow faster train running speeds to and from the branch line)</i>	██████████



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

FINANCIAL CASE - How much it will cost, and how it will be funded

<i>Branch line signalling improvements, to remove the need for token operation and allow more than one train on the branch at a time</i>	██████████
<i>Track bed work – allowed on the basis of 5,500m of branch line and two passing loops each of 800m, costed at £1,500 per linear metre of track</i>	██████████
<i>Station costs at Sharpness – new DDA compliant station, potentially with two platforms</i>	██████████
<i>Operational Costs (Service Subsidy) – Year 4 @ £1m, declining pro rata to £206,000 in Year 19</i>	██████████
<i>Contingency allowance for works to Gloucester Station approaches</i>	██████████
<b>Total COST</b>	██████████

### 4.1.2 Financial profile

The costs have been phased across an assumed four-year design and construction process, on the basis of the proportions below:

Year	Total	1	2	3	4	10
<i>First phase - establishing the Heritage railway</i>	██████████	██████████	■	■	■	■
<i>Second phase - developing the tourism offer - Berkeley Station Halt</i>	██████████	██████████	■	■	■	■
<i>Mainline junction</i>	██████████	■	██████████	██████████	■	■
<i>Branch line signalling</i>	██████████	■	██████████	██████████	■	■
<i>Track bed work</i>	██████████	■	██████████	██████████	██████████	■
<i>Station costs at Sharpness</i>	██████████	■	■	██████████	██████████	■



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

FINANCIAL CASE - How much it will cost, and how it will be funded

Operational Costs (Service Subsidy)	██████████	■	■	■	██████████	■
Contingency – Gloucester Station works	██████████	■	■	■	■	██████████
<b>Total COST</b>	██████████	██████████	██████████	██████████	██████████	██████████

## 4.2 FUNDING

### 4.2.1 Anticipated Sources of Funding

As this submission is part of the bidding process for the Restoring your Railway funds identified by DfT, the way that the scheme will be funded has not yet been determined. However, there are a range of potential sources, all of which will need to be explored as the proposal comes forward. Apart from the DfT funding source through this bid, other potential sources are identified here for completeness:

- **LEP** - The local LEP is supportive of the growth point at Sharpness and in addition is also keen to offer support to significant sustainable infrastructure projects as part of its remit to facilitate sustainable development across the region.
- **LOCAL AUTHORITIES** – The public sector authorities would also be expected to contribute to the delivery of sustainable growth in their area through the adoption of suitable policies and schemes, for example, through the Local Transport Plan. Gloucestershire County Council's emerging LTP review does not currently feature the Sharpness branch line proposals (the review was drafted before these became known about), but it is supportive of creating opportunities for travel behaviour change and recognizes the critical importance of bringing about a shift to more sustainable modes of travel compared to the private car.
- **NETWORK RAIL** – are the asset owners, and irrespective of any aspiration they may have to improve the line, would see a betterment of their asset through the development of the scheme. In addition, there are reports that DRS, the freight operator on the line, has been seeking upgrades to the line to allow more modern, heavier rolling stock to be able to access the facilities at Berkeley.
- **TRAIN OPERATORS** – The TOC's are generally expected to invest in their franchise areas, often through improvements to station infrastructure and facilities.
- **CIL** – the adoption of CIL by Stroud District Council allows an apportionment of development contributions towards the promotion of strategic sustainable transport infrastructure projects that benefitted the whole of the District. The Sharpness branch line scheme has the potential to reduce reliance on road transport to the benefit of the District and County as a whole





## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

FINANCIAL CASE - How much it will cost, and how it will be funded

- **S106 / DEVELOPER** – Contributions towards infrastructure could be expected from developers that would benefit from the provision of the scheme. In the case of Sharpness, it would be anticipated that contributions could be sought towards the operational subsidies, on the basis that the capital costs were establishing a public asset, but the developer should be encouraged to incentivize its usage and underwrite its early provision when the volume of development may not be sufficient to support the service itself.
- **VOBR** – VoBR members would be able to make some contributions to the capital costs of the scheme, which may be in benefit-in-kind contributions of their resources. Their charitable status, and objectives to improve the tourism economy in the area may open opportunities to apply for grants and funds in support of this objective to assist in the delivery of the project overall.

### 4.2.2 Anticipated apportionment of funding

This will need to be considered in detail as the project comes forward, but the funding for the scheme is likely to be predominantly procured in the following way.

The anticipated contributors are considered at this stage to represent the best and most likely sources of funding for the project. It is expected to be a collaborative effort, recognising that a range of stakeholders stand to benefit from the scheme as it is delivered. Beyond this, there may well be a need for shortfall funders to also contribute to help to deal with cash flow and approval challenges and ensure that the scheme can go ahead with appropriate contingencies underwritten.

It should be noted that, at this early stage, the order of the funders listed below is not intended to convey any impression of which sources may contribute what proportions. The stakeholders understand that they will need to work together to deliver the project.

#### ANTICIPATED CONTRIBUTORS:

- **LOCAL AUTHORITIES** – Through the Local Transport Plan and Infrastructure Plan delivered alongside the Local Plan allocations (including Sharpness) to deliver the upgrades and capacity needed to support Local Plan growth.
- **DEVELOPER FUNDS** – S106 & CIL contributions to support the Sharpness Vale development
- **Via VoBR** – Access to tourism, heritage and charitable grants to deliver these benefits into the scheme

#### SHORTFALL FUNDERS:

- **RESTORING YOUR RAILWAY FUNDS** – Will be necessary to a greater or lesser extent to underwrite the capital costs of public asset development that will have a benefit beyond the anticipated contributors above.
- **LEP** – Would be expected to want to ensure the delivery of such a clearly sustainable infrastructure project within the region as part of their remit.



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

FINANCIAL CASE - How much it will cost, and how it will be funded

- **NETWORK RAIL** – a potential betterment contribution
- **TRAIN OPERATORS** – who are likely to benefit from an increase to their franchise operations and long-term fare box revenue.

### 4.2.3 Financial appraisal

Budgetary details will need to be developed as part of a formal business case submission in due course, and have not been developed for this overview approach. However, there are a series of issues that fall under the heading of financial management that can be identified at this stage.

#### 4.2.3.1 Capital versus operational costs

Within the rail sector, there is a division in any event between capital and operational costs, as the franchise structure means that there is a separation between the rail and wheel. Network Rail owns and manages the fixed assets and infrastructure – track, stations, signal and structures, whilst the train operating companies (TOC's), under their franchise agreements, operate trains. Hence, the capital infrastructure costs rest with Network Rail and the operating costs rest with the TOC's.

The re-introduction of passenger services to the Sharpness branch line will require both capital and operational investment. The development of the signalling systems, track bed and stations will require significant capital investment, whilst the requirement to provide train services at an early stage of the Sharpness Vale development, to encourage the adoption of sustainable travel habits from the outset, will require support for operational costs.

This overview business case makes allowances for both of these, but a more detailed business case will be required to consider the sources of each type of funding and how it is to be procured and managed.

There will need to be an agreement by the stakeholders regarding which of them takes the lead in the delivery of the project. This is certain to be one of the public authorities, as they will be the recipients of funds from a range of sources which would not be open to other stakeholders in the project. The exact form of this structure, and how it is managed will be developed as the scheme progresses, and will be contingent on where and how funding is secured.



## 5.0 ECONOMIC CASE – OUR OPTIONS AND THE EXTENT TO WHICH THEY PROVIDE VFM

This section covers the economic case. The main aim is to set out the impacts of potential investment in re-establishing passenger services on the Sharpness branch line, both in terms of costs and benefits, and demonstrate the value for money in the use of public sector expenditure. The economic case will ultimately need to be prepared in line with the underlying principles and requirements of HM Treasury's Green Book, which is used across government for investment decisions through identification, selection and appraisal of options. This overview style business case is robust enough to support the bid for consideration in the Restoring your Railway fund process, but is not detailed in such a way as to support formal business case considerations by funding authorities. It will need to be further refined to meet this requirement, but with this overview assessment as the basis for appraisal.

The analysis takes account of appraisal guidance prepared by MHCLG, particularly on estimates of land value uplifts and the treatment of additionality, albeit at a broad-brush level at this stage.

The economic case presents the extent to which the re-commencement of passenger train services on the Sharpness Branch Line would benefit the UK economy through tourism and development provision, the local housing market in the South-West and Stroud District and the provision of more sustainable transport for existing and new communities.

In summary, an overview cost benefit analysis (CBA) has been used to determine whether the benefits enabled by the infrastructure investment, in terms of securing tourism and development investment and growth, are sufficient to outweigh the net costs of funding the investment. The benefits are essentially made up of the economic values created by tourism activity in the area and the uplift in land value generated by the infrastructure investment and the benefits that accrue from recreational benefits for those living and working in the area, while the net cost is the difference between the investments paid to support the infrastructure minus the repayments.

It should be noted that there are additional benefits that could be quantified and included in a more refined business case – related to environmental benefits, socio-economic and employment benefits related to commercial development and the proposed VoBR activities. Therefore, even though the cost estimates used at this stage will also need refinement for a formal business case, the appraisal presented here is considered robust.

### 5.1 OPTIONS CONSIDERED

The Strategic Case set out above draws the clear conclusion that intervention in the re-provision of passenger train services would confer economic benefits.

No other options were considered that involved a different profile of development. It would have been possible to undertake a theoretical appraisal of a slower / smaller development profile at Sharpness. This would represent a case somewhere between the business case scenario and the do-nothing option. However, this was discounted as it would require an assumption that a more organic and



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piecemeal approach to development may be considered acceptable at Sharpness, and this is unlikely to be the case.

Under the current standard housing method, the Government requires the Stroud District Local Plan Review to provide for at least 638 new homes per year (based on previous 2014 household projections). This requires a 40% increase on the figure in Stroud District Council's current Local Plan of 456 homes per year. To meet this new challenging target every year over a 20-year period will require the Local Plan Review to identify land for at least 12,800 new homes. Currently, 7,100 new homes have received permission or are already identified in the current Local Plan and Stroud District Council needs to identify land for at least 5,700 homes to meet this target. The proposals at Sharpness Vale provides the opportunity to deliver at least 2,400 of these new homes by 2040 – or over 40% of the additional growth required.

Beyond 2040, the Sharpness Vale proposals offer real potential to deliver a significant proportion of future growth requirements for the District, building upon the solid foundation of infrastructure-led growth during the next plan period. As such, for Stroud, the proposals at Sharpness have the potential to make a very significant contribution to closing the housing supply gap both now and in the future. It is also worth noting that under the Government's proposed new standard method for calculating housing need, this could further increase the requirement for Stroud to deliver at least 786 new homes per year.

Several potential options for the delivery of employment and housing were tested during the development of the Stroud District Local Plan Review. The potential options for growth included:

- Continued concentration of housing and employment development at a few large sites, located adjacent to the main towns in the District.
- A more dispersed approach with some medium sized housing and employment sites on the edge of larger villages, as well as towns.
- Dispersed development across the District with most villages including at least one small to medium site allocated to meet local needs
- Identify a growth point in the District to include significant growth, either as an expansion of an existing settlement, or to create a new settlement.

In the identification of a potential growth point it was recognized that the scale of growth would provide the best opportunity to provide non car alternatives in transportation. Following consultation, the emerging Local Plan Review proposed Sharpness as a potential growth point for the District that would deliver 10 hectares of new employment land and 2,400 new dwellings up to 2040 and a further 2,600 dwellings in the next plan period.

Sharpness is the largest allocation of the emerging Plan and was specifically designed at this scale to ensure that the development could deliver sustainable and transformational change in the way we both live and work. Part of the criteria for the growth point was to ensure that new development could deliver a sustainable infrastructure which through design, could deliver behavioural change in the way we travel and thereby reducing our carbon output. Equally, it was also envisaged that significant new development in this area would also stimulate the regeneration of large tracts of derelict land that have lay fallow in this area for a considerable period. The Local Plan ambition was therefore to deliver



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a significant amount of new employment and housing in one location that would in turn be able to develop an environmentally friendly and sustainable new infrastructure for the area that could be expanded in the future to deliver further housing in successive plan periods and thereby ensuring that this growth point paved the way for sustainable development and a zero carbon agenda.

### 5.2 INVESTMENT REQUIRED, ESTIMATED OUTTURN COST AND OPTIMISM BIAS ALLOWANCE

it is important that the costs for the scheme are determined with as much certainty as possible at an early stage, and that they are appropriately tested to ensure that they are reliable and meet the tests of value for money for public funding. In the absence of a detailed design for the works at this stage, which would be costly and time-consuming to prepare, broad cost estimates, benchmarked against other, similar schemes, have been used to develop an overall cost profile for the scheme.

#### 5.2.1 Other costs

The case also allows for consideration of operational costs related to the way that services may be procured and that the initial services may need to be pump-primed for some time whilst housing and commercial development is becoming established. It is assumed that the services would become profitable once the Sharpness Growth Point was almost complete, and so any operational costs relate to the need to support the early phases of development, when absolute patronage is lower, so that the service can become established and residents can rely upon it.

The spreadsheet model assumes that support will be needed for 15 years after the opening of the railway to passenger services.

The costs of land purchase, either for infrastructure or stations has not been included. It is assumed that these would be dealt with on a separate commercial basis where necessary.

### 5.3 COSTS ASSESSMENT

The capital cost of the scheme has been derived on the basis of the costing methodology set out above, as these form the basic sum which will need to be secured to allow the project to proceed.

However, as identified in the section on Risks and Mitigation, additional sums are identified to deliver the project and mitigate the potential risks that may occur once the detailed design process and delivery are underway. Therefore, the Estimated Outturn Cost is as follows:

Item	Description	Estimated Outturn Cost
Design and Planning – 5% allowance	Development of the project scheme, planning and / or TWA Order process as appropriate, feasibility, legal costs, funding procurement costs	██████████



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Detailed Design Costs – 3% allowance	Construction capable design process and contractor procurement, following grant of necessary consents.	██████████
Infrastructure Costs	Trackwork, signalling, stations, bridges, culverts, utility diversions and supplies, accommodation works  NOT land costs	██████████
Operational Costs	Initial service subsidy whilst adjacent Growth Point development becomes establishing - and noting that a phased introduction of services may be appropriate.	██████████
CONTINGENCY: Detailed Design changes and constraints	Allowance for over-coming unforeseen constraints at the Detailed Design stage	██████████
CONTINGENCY: Network Rail licenses / track possession costs	Contingency against the need to undertake work at less economically advantageous times	██████████
CONTINGENCY: Upgrades required on approaches to Gloucester Station	Contingency to deliver signalling and track upgrades to Gloucester station to allow the second train per hour to run from Sharpness, if this has not already been delivered by others	██████████
<b>TOTAL</b>		██████████
*n.b. costs in this table EXCLUDE Optimism Bias		

### 5.3.1 Risk mitigation

It is important as part of the business case to identify circumstances that could arise that may mean the costs of the project delivery could have been underestimated or that the potential to achieve recovery of the costs would not be achieved where this has been included. The case is prepared on the basis that the Estimated Outturn Cost is only expected to be partially recovered, on the basis of the farebox revenue and station concessions etc. The project operates on the basis that the service is commercially viable to operate, but much of the capital investment required to re-establish the public asset of the railway line (which has been allowed to fall into relative decline) would need to be evaluated against wider social benefits.

This is considered reasonable, as the scheme will significantly enhance the opportunity to provide much-needed housing in a wholly sustainable manner at Sharpness and bring other, wider economic benefits, which would otherwise be difficult to achieve.



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There are other factors that may affect the recovery through the farebox – if development progress was delayed a partially stranded asset would have been created where some of the capacity provided was not required by Growth Point residents as expected. Similarly, the VoBR, as a charitable organization relying on donations and goodwill of tourists, may not be able to generate the activity that was anticipated.

#### 5.3.2 Optimism Bias

It is appropriate to make an allowance for optimism bias (OB) in the development of any outline case.

For the purposes of this scheme the allowance has been assessed on the basis of Green Book Table 7 - Standard Civil Engineering. This would suggest a level of OB in the range between 3% and 44%.

On the basis of the fact that little design work has been completed to date, but benchmarking of the likely costs provides some robustness to the sums allowed for, an OB assumption at the upper end of the range is considered to be most appropriate.

Therefore a 33% OB figure has been allowed for in respect of the project. After discounting, this increases the overall costs of the project included in the BCR assessment by [REDACTED].

This is considered to be an appropriate level of optimism bias in this case as it provides significant additional robustness to an overview appraisal at this stage of the project.

## 5.4 COST BENEFIT ANALYSIS

The section sets out the methodology applied in undertaking a very preliminary Cost Benefit Analysis (CBA) to determine the potential value-for-money (vfm) for the project against a series of sensible assumptions. The aim of the CBA is to estimate the impacts associated with enabling the accelerated tourism activity and delivery of much-needed development and determine whether the benefits, in terms of economic activity and uplift in land value, would outweigh the public sector costs. The following list sets out the assumptions and inputs used.

### 5.4.1 Assumptions and Inputs:

The analysis makes assumptions about the additionality benefits that will accrue from the release of additional tourism activity in Sharpness and the release of land for sustainable development in the Growth Point. The most significant of these have been quantified and included in this overview appraisal, whilst others would need to be incorporated at the next stages of the appraisal process. The assumptions are as follows:

#### Tourism benefits:

- An additional level of expected tourism spending in the area as a result of the delivery of the VoBR, in a way that is accessible via the public railway. This benefit has been estimated in the appraisal based on information from “*The Economic Impact of Gloucestershire’s Visitor Economy 2017*” undertaken by The South West Research Company Ltd for Cotswold District Council.
- The tourism benefit is based on an average spend of £184.00 per trip for a Staying Visitor and £33.29 for a Day Visitor.



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- Assumptions in respect of the uplift attributable to the new visitor attraction planned by VoBR are modest – assumed to be a 0.3% increase on the visitors to Stroud District in the first four years of operation, 0.8% in the next four years, and 1.5% thereafter when they have delivered the complete heritage asset.

#### Development benefits:

- 5,000 new homes located at Sharpness (this benefit is included, and quantified on the basis of the economic benefit of land value uplift)
- An additional 10 hectares of land for commercial and employment development, which could be rail-connected in the area (this benefit is included, and quantified on the basis of the economic benefit of land value uplift)
- An enhanced value to the existing Docks and associated Industrial Estate as a result of the enhanced accessibility by rail and adjacent workforce available in the growth point project (this benefit is NOT included in the overview appraisal)
- The uplift in residential land value is based on the per hectare value provided in *Land Value Estimates for Policy Appraisal*. The figures for Stroud (£2.35m / ha) were used.
- For the residential development, the existing use value for all the land is assumed to be the agricultural land value for the South West (£23,000 / ha) as the growth point constitutes predominantly agricultural land;
- Net Social Value of typical non-residential development taken from Appendix E of DCLG Appraisal Guide. Value of uplift per m<sup>2</sup> used is that for South West (range between Exeter at £24 and Bristol at £45). The case assumes values weighted more towards Bristol to reflect the character of the area based on the proximity to Bristol. Weighting is 60% Bristol and 40% Exeter to arrive at a value of £366,000 / ha.

#### Costs and appraisal parameters:

- Anticipated capital cost of the investment required is [REDACTED] profiled over a four-year period nominally from 2021 onwards (drawn down 5% in Year 1, 23% in Year 2, 43% in Year 3 and 16% in year 4 – the final tranche of 14% relates to the contingency for works at Gloucester station should it be required);
- The investment cost includes an Optimism Bias adjustment factor of 33% on top of the overall Estimated Outturn Cost;
- An appraisal period of 30 years is applied and discounted using the standard rate of 3.5%;
- No real increase in land values is assumed over the appraisal period;
- In terms of estimating the degree to which the impacts are additional, calculations were applied to account for deadweight and displacement. These assumptions were applied on a common basis to all of the sites and land uses, allowing 20% for deadweight and 20% for displacement.
- The net effect of these factors at a total level is to produce additionality of 64% for the scheme.

### 5.4.2 Results of appraisal

The appraisal is undertaken via an Excel spreadsheet model, which is included at Appendix A attached to this assessment.

The cost is essentially the net difference between the investment made into the railway, spent in years 1 to 4, reduced by any non-recoverable contributions from other funders (These could include contributions through CIL or S106 contributions, but have been omitted for the purposes of this





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assessment to ensure a robust case). Applying a 3.5% discount rate the present value of costs (PVC) sum to [REDACTED].

The benefits are calculated by estimating the increased economic activity resulting from the scheme. These are based on the relative uplift in land value in the development that occurs and the additional recreational benefits that will accrue based on the opening up of new leisure routes in the Sharpness area.

The uplift in land value is estimated for residential and non-residential development applying the assumptions above. The present value of benefits (PVB) generated by the tourism benefits, land value uplift and recreational benefits is estimated to be £253.6m. Applying deadweight and displacement adjustments outlined above results in a present value of benefits of just over £162.3m over the 30-year appraisal period.

The PVB and PVC generate a healthy Benefit Cost Ratio (BCR) of 5.03 before adjusting for deadweight and displacement, and 3.22 afterwards.

## 5.5 BENEFITS IDENTIFICATION

From the analysis, the key benefits generated by the scheme are the tourism, recreational and uplifts in land value. Bringing the residential development forward delivers benefits of £199.9m, while accelerating the non-residential development generates benefits of £121.0m. The tourism benefits are estimated to amount to £39.3m and the recreational benefits represent a helpful contribution of around £2.2m.

In addition to the benefits associated with the tourism, land value uplift and recreational benefits, the development will also generate other less economically tangible effects:

- Enhanced recreational accessibility
- Increased sustainable transport infrastructure in the area, allowing consideration of future growth potential that may be released
- Enhanced access for freight traffic to the rail network – especially for bulk goods from the docks, which could see significant regeneration of this asset

Wider economic benefits will be seen in the viability and attractiveness of future development opportunities potentially throughout the District, attracting inward investment and job opportunities. This could affect the type of commercial activity investment attracted, where a strong sustainable transport provision is essential, such as hi-tech and educational facilities, as well as tax benefits with the movement and provision of labour to more productive jobs.

The project will also mean that housing is available in the South-west more quickly, and with a greater range of types and locations than would otherwise be the case. This will provide the benefit that more people are likely to be able to find a home that is suited to their needs and lifestyle.

In addition, sustainability benefits will accrue, as Sharpness will be transformed into a highly sustainable location, for people to be able to live and work with a much-reduced reliance on the private car.



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The proposals at Sharpness Vale could also act as a catalyst for the wider consideration of infrastructure and growth by Stroud District Council and neighbouring local authorities, such as Forest of Dean District Council. The proposals at Sharpness could, for example, help to facilitate pioneering proposals for a new Severn River Crossing by re-establishing the former rail line crossing or provide a new crossing (or possibly both). With the river crossing, the potential for Stroud and Forest of Dean to collaborate on a new settlement, with housing and employment delivery advantages to both could be explored.

## 5.6 KEY FINDINGS

The key findings are summarised in the table below (and these results can be traced in detail on the spreadsheet model at Appendix A). Overall the figures reveal that for ██████ invested to re-deliver passenger rail services to Sharpness, this will generate over £203.14m in public benefits i.e. for every ██████ invested almost ██████ in benefits will be delivered. If the investment does not go ahead then the benefits will not materialise.

**Appraisal Summary Table**

		Investment Scenario relative to status quo
A	Present Value Benefits [based on Green Book principles and Green Book Supplementary and Departmental guidance (£m)]	£253.61m
B	Present Value Costs (£m)	██████
C	Present Value of other quantified impacts (£m)	n/a
D	Net Present Public Value (£m) [A-B] & [A-B+C]	██████
E	'Initial' Benefit-Cost Ratio [A / B]	████
F	'Adjusted' Benefit Cost Ratio [(A + C) / B]	n/a
G	Significant Non-monetised Impacts	Holistic delivery of housing allocations for Stroud create economies of scale and allow greater mitigation of effects, and create greater opportunities
H	Value for Money (VfM) Category	High to Very High
I	Switching Values & rationale for VfM category	Switching values not considered in this outline business case
J	DfT (RyR) Financial Cost (£m)	Maximum contribution of ██████ (full anticipated scheme cost)
K	Risks	As detailed in this overview assessment.
L	Other issues	None



## 6.0 CONCLUSIONS & SUMMARY

This further submission in respect of the proposals to re-instate passenger services on the Sharpness branch line in Stroud is intended to demonstrate that the scheme would create sufficient public benefits to justify its inclusion in the next round of detailed business case funding for the Restoring your Railway funds.

The proposals include:

- The sequential development of heritage passenger rail services on the branch line, providing a new tourist attraction in the area
- The re-provision of a scheduled passenger train service between Sharpness and Gloucester, with a stop at Cam & Dursley

The submission includes detailed timetable modelling to demonstrate that the planned service can be accommodated on the railway network – both now, and when considered in the context of other planned service changes (the MetroWest services on the main line in particular). It also sets out the results of patronage forecasting related to both the existing community and that may arise from the proposed Sharpness Vale growth point, and suggests that as many as one million trips could be expected at the Sharpness station when the development is complete.

It considers the costs, potential tourism, development and leisure benefits of the scheme, and appraising them in a similar way to that set out by the “Green Book” assessment. Although this is not a fully detailed business case appraisal, it contains sufficient elements to give considerable confidence to the benefits of the scheme overall.

The appraisal shows that overall public benefits of more than £253m could be derived, for an investment risk of around ██████. This suggests a very healthy BCR of more than ██████ – a result in the “Very High” value category.

The submission sets out in some detail the infrastructure works that would be required to achieve the reintroduction of the passenger service, and the other benefits, including:

- The upgrades to the branch line track and signalling
- Upgrades to the connection to the main line
- The provision of new station facilities on the branch line
- The possibility of the need, eventually, to upgrade the signalling and track on the approach to Gloucester station

All of the costs of this work are included in the appraisal, allowing estimates that have been benchmarked against other similar schemes where the costs have been derived.

The submission concludes that the scheme is both viable, and can feasibly be delivered in terms of both infrastructure works and timetable constraints.



# **APPENDIX A**

## **Spreadsheet Model**

**RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE**

Appendix A Spreadsheet Business Case Model

**Appendix A SPREADSHEET BUSINESS CASE MODEL**

# RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

## Appendix A Spreadsheet Business Case Model

Sharpness Vale - Restoring your Railway Fund Bid - Benefits Spreadsheet															
Value for Money Assessment															
<b>Benefits Collator:</b>															
	<b>TOTAL</b>	Development	Recreational	Tourism											
Present Value of Benefits (PVB)	£253,608,957	£212,092,098	£2,224,450	£39,292,408											
Present Value of Costs (PVC)															
Net Present Value (NPV)															
Benefit Cost Ratio (BCR)															
<b>VfM Assessment</b>															
			Residential	Commercial	Recreational	Tourism		<b>Residential</b>	<b>Commercial</b>		<b>Recreational</b>	<b>Tourism</b>			
<b>Total</b>							<b>Total</b>		Out of Town Office	Industrial					
Present Value of Benefits (PVB)	£253,608,957		£199,937,509	£12,154,589	£2,224,450	£39,292,408		£199,937,509	£6,077,295	£6,077,295	£2,224,450	£39,292,408			
Present Value of Costs (PVC)															
Net Present Value (NPV)															
Benefit Cost Ratio (BCR)															
<i>Deadweight</i>	0.8							0.8	0.8	0.8	0.8	0.8			0.8
PVB	£202,887,165.51	£50,721,791	£39,987,502	£2,430,918	£444,890	£7,858,482	£202,887,166	£159,950,007.21	£4,861,836	£4,861,836	£1,779,560	£31,433,927			
PVC															
NPV															
BCR															
<i>Displacement</i>	0.64							0.8	0.8	0.8	0.8	0.8			0.8
PVB	£162,309,732	£91,299,224	£71,977,503	£4,375,652	£800,802	£14,145,267	£162,309,732	£127,960,006	£3,889,469	£3,889,469	£1,423,648	£25,147,141			
PVC															
NPV															
BCR															
<i>Aditionality</i>	64%	0					64%	50%	2%	2%	1%	10%			

# RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

## Appendix A - Spreadsheet Business Case Model

Sharpness Vale - Restoring your Railway Fund Bid - Benefits Spreadsheet

Development Benefits		Overall Discount rate 3.500%																					
Year		Totals Column																					
Discount factor		1.0000	0.9651	0.9321	0.9009	0.8714	0.8433	0.8165	0.7910	0.7667	0.7436	0.7216	0.7006	0.6805	0.6613	0.6430	0.6256	0.6091	0.5934	0.5784	0.5641		
		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039		
		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Residential	Number of houses	5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Number of houses - residential @ average 35/dph	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Total residential hectares	142.86	0.00	0.06	0.26	0.86	2.46	5.14	8.86	12.54	16.26	19.94	23.66	27.34	31.06	34.74	38.46	42.14	45.86	49.54	53.26		
	Housing unit value (From Factors)	2309.820	£14,700	£330,329	£347,066	£364,400	£383,041	£402,771	£423,601	£444,624	£465,842	£487,257	£508,871	£530,686	£552,703	£574,923	£597,348	£620,000	£642,880	£665,990	£689,331		
	Land value offer development - residential	£0	£2,014,286	£6,714,286	£11,414,286	£16,114,286	£20,814,286	£25,514,286	£30,214,286	£34,914,286	£39,614,286	£44,314,286	£49,014,286	£53,714,286	£58,414,286	£63,114,286	£67,814,286	£72,514,286	£77,214,286	£81,914,286	£86,614,286	£91,314,286	
	Land value before development - RESIDENTIAL TOTAL	£35,714,286	£0	£2,014,286	£6,714,286	£11,414,286	£16,114,286	£20,814,286	£25,514,286	£30,214,286	£34,914,286	£39,614,286	£44,314,286	£49,014,286	£53,714,286	£58,414,286	£63,114,286	£67,814,286	£72,514,286	£77,214,286	£81,914,286	£86,614,286	
	Total land value before development	£0	£19,714,286	£6,714,286	£11,414,286	£16,114,286	£20,814,286	£25,514,286	£30,214,286	£34,914,286	£39,614,286	£44,314,286	£49,014,286	£53,714,286	£58,414,286	£63,114,286	£67,814,286	£72,514,286	£77,214,286	£81,914,286	£86,614,286	£91,314,286	
	Land value uplift - Residential to RESIDENTIAL	£0	£1,994,571	£6,448,571	£11,302,571	£16,156,571	£21,010,571	£25,864,571	£30,718,571	£35,572,571	£40,426,571	£45,280,571	£50,134,571	£54,988,571	£59,842,571	£64,696,571	£69,550,571	£74,404,571	£79,258,571	£84,112,571	£88,966,571	£93,820,571	
	Total land value uplift residential	£0	£1,994,571	£6,448,571	£11,302,571	£16,156,571	£21,010,571	£25,864,571	£30,718,571	£35,572,571	£40,426,571	£45,280,571	£50,134,571	£54,988,571	£59,842,571	£64,696,571	£69,550,571	£74,404,571	£79,258,571	£84,112,571	£88,966,571	£93,820,571	
	Total Overall Residential Benefits	£0	£1,994,571	£6,448,571	£11,302,571	£16,156,571	£21,010,571	£25,864,571	£30,718,571	£35,572,571	£40,426,571	£45,280,571	£50,134,571	£54,988,571	£59,842,571	£64,696,571	£69,550,571	£74,404,571	£79,258,571	£84,112,571	£88,966,571	£93,820,571	
Commercial	Number of factories - OFFICE - Out of Town	5	0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	Number of factories - Industrial	5	0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	Total commercial hectares	10	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	Land value offer development - OFFICE - Out of Town	£0	£0	£0	£0	£1,281,000	£1,281,000	£1,281,000	£1,281,000	£1,281,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0		
	Land value offer development - Industrial	£0	£0	£0	£0	£1,281,000	£1,281,000	£1,281,000	£1,281,000	£1,281,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0		
	Total land value before development	£33,830,000	£0	£0	£0	£2,562,000	£2,562,000	£2,562,000	£2,562,000	£2,562,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0		
	Land value before development - Agricultural	£0	£0	£0	£0	£3,000,000	£3,000,000	£3,000,000	£3,000,000	£3,000,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0		
	Land value before development - Industrial	£0	£0	£0	£0	£23,000,000	£23,000,000	£23,000,000	£23,000,000	£23,000,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0		
	Total land value before development	£33,830,000	£0	£0	£0	£46,000,000	£46,000,000	£46,000,000	£46,000,000	£46,000,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0		
	Land value uplift - OFFICE - Out of Town	£0	£0	£0	£0	£1,251,000	£1,251,000	£1,251,000	£1,251,000	£1,251,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0		
Land value uplift - Industrial	£0	£0	£0	£0	£1,251,000	£1,251,000	£1,251,000	£1,251,000	£1,251,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0			
Total land value uplift commercial	£12,580,000	£0	£0	£0	£2,512,000	£2,512,000	£2,512,000	£2,512,000	£2,512,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0			
Total Overall Commercial Benefits	£0	£0	£0	£0	£2,512,000	£2,512,000	£2,512,000	£2,512,000	£2,512,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0			
Benefits	Total land value uplift residential	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035		
	Total land value uplift commercial	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0		
	Total land value uplift	£345,000,571	£0	£1,994,571	£6,448,571	£11,302,571	£16,156,571	£21,010,571	£25,864,571	£30,718,571	£35,572,571	£40,426,571	£45,280,571	£50,134,571	£54,988,571	£59,842,571	£64,696,571	£69,550,571	£74,404,571	£79,258,571	£84,112,571	£88,966,571	
	Total Overall Benefits	£345,000,571	£0	£1,994,571	£6,448,571	£11,302,571	£16,156,571	£21,010,571	£25,864,571	£30,718,571	£35,572,571	£40,426,571	£45,280,571	£50,134,571	£54,988,571	£59,842,571	£64,696,571	£69,550,571	£74,404,571	£79,258,571	£84,112,571	£88,966,571	
	Discounted Benefits	Land value uplift - Agricultural to RESIDENTIAL	£999,937,509	£0	£1,927,122	£6,206,513	£10,194,272	£16,428,923	£26,076,254	£39,725,511	£58,206,251	£84,483,229	£121,428,229	£181,967,429	£270,843,229	£404,128,229	£601,428,229	£882,428,229	£1,297,428,229	£1,902,428,229	£2,802,428,229	£4,102,428,229	£6,002,428,229
		Land value uplift - OFFICE - Out of Town	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	
		Land value uplift - Industrial	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	
		Total land value uplift commercial	£12,580,000	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	
		Total Overall Discounted Benefits	£1,002,517,509	£0	£1,927,122	£6,206,513	£10,194,272	£16,428,923	£26,076,254	£39,725,511	£58,206,251	£84,483,229	£121,428,229	£181,967,429	£270,843,229	£404,128,229	£601,428,229	£882,428,229	£1,297,428,229	£1,902,428,229	£2,802,428,229	£4,102,428,229	£6,002,428,229
		New Footpaths	Marine - Estimated visits per annum	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
River Side - Estimated visits per annum			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total recreational trips created			1040000	0	0	0	0	0	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	
Social value per visit - Marine (DVAL)			£2.79	£2.81	£2.83	£2.85	£2.87	£2.89	£2.91	£2.93	£2.95	£2.97	£2.99	£3.01	£3.03	£3.05	£3.07	£3.09	£3.11	£3.13	£3.15	£3.17	
Social value per visit - River Side (DVAL)			£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	
Social value - Marine	£0		£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0		
Social value - River Side	£0		£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0		
Total recreational value	£4,081,859		£0	£0	£0	£0	£0	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	
Total Overall Recreational Benefits	£4,081,859		£0	£0	£0	£0	£0	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212	£112,212		
Tourism Benefit	Additional Staying Visitors		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	
	Additional Day Visitors	0	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003		
	Total additional trips created	10900714.32	0	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003	8003		
	Spend value per Staying Visitor Trip	£184.00	£187.48	£191.43	£195.24	£199.17	£203.12	£207.11	£211.14	£215.21	£219.32	£223.47	£227.66	£231.89	£236.16	£240.47	£244.81	£249.19	£253.61	£258.07	£262.57		
	Spend value per Day Visitor Trip	£13.25	£13.35	£13.45	£13.55	£13.65	£13.75	£13.85	£13.95	£14.05	£14.15	£14.25	£14.35	£14.45	£14.55	£14.65	£14.75	£14.85	£14.95	£15.05			

# RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

## Appendix A Spreadsheet Business Case Model

Sharpness Vale - Restoring your Railway Fund Bid - Benefits Spreadsheet																															
Project Costs																															
Overall Discount rate	3.500%																														
Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Discount factor	1.0000	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594	0.7337	0.7089	0.6849	0.6618	0.6394	0.6178	0.5969	0.5767	0.5572	0.5384	0.5202	0.5026	0.4856	0.4692	0.4533	0.4380	0.4231	0.4088	0.3950	0.3817	0.3687	0.3563
<b>Costs</b>	<b>Costs Analysis</b>																														
	First phase - establishing the Heritage railway																														
	Second phase - developing the tourism offer - Berkeley Station Halt																														
	Mainline Junction																														
	Branchline signalling																														
	Trackbed work																														
	Station costs at Sharpness																														
	Signalling upgrades at Gloucester Station (Contingency)																														
	Operational Costs (Service Subsidy)																														
	<b>Total COST</b>																														
	Network Rail - betterment payment																														
	<b>Total Income</b>																														
	Costs less Income																														
	Customised Plus (Green Book Table 7 - Standard C Eng - 3% - 40%)																														
	<b>Discounted costs</b>																														
<b>Costs Analysis and Assumptions:</b> 1) Track work assumed to comprise: 5,500m of re-laid track @£1,500 per linear metre; new passing loop at Sharpness (800m), passing loop at Berkeley (800m), re-signalling and mainline turnouts (£5m assumed) and re-signalling the branchline (£2.5m assumed) 2) Station building assumed to be "single-sided" - no bridge to meet DDA compliance - say £15m 3) Assume two years design programme and 3 years build																															

<b>Residential</b>	
Average house price (Value per housing unit) - STROUD	£299,809 Source: <a href="https://www.gov.uk/government/publications/uk-house-price-index-england-may-2020/uk-house-price-index-england-may-2020">https://www.gov.uk/government/publications/uk-house-price-index-england-may-2020/uk-house-price-index-england-may-2020</a>
Value of INDUSTRIAL land value, per hectare	£915,000 Average industrial land value estimates by region per hectare - SOUTH WEST
Value of brownfield land before development, per hectare	£23,000 Average agricultural land value estimates by region per hectare - Average of Gloucestershire and West of England LEP areas
Value of Residential Land Value Estimates, per hectare - STROUD	£2,350,000
Value of Residential Land Value Estimates, per hectare - STROUD	£2,350,000
Value of Residential Land Value Estimates, per hectare - Average of two areas above (if two areas require)	£2,350,000
Annual increase in unit value	5.00% May 2019 to May 2020 was 10.3% for Stroud (very high)
<b>Commercial</b>	
Value of brownfield land before development, per hectare	£915,000 Average industrial land value estimates by region per hectare - SOUTH WEST
Net Social Value of Typical non-resi development - brownfield uplift per m2 - Exeter	£24 DCLG Appraisal Guide Figure 19
Net Social Value of Typical non-resi development - brownfield uplift per m2 - Bristol	£45 DCLG Appraisal Guide Figure 19
Net Social Value of Typical non-resi development - brownfield uplift per ha - Exeter	£240,000
Net Social Value of Typical non-resi development - brownfield uplift per ha - Bristol	£450,000
	£366,000 equals 0.6 Bristol and 0.4 Exeter
Net Social Value of Typical non-resi development - brownfield uplift per ha - Assumed for SHARPNESS	£1,281,000 add on original land value to uplift
<b>Agricultural and Recreational</b>	
Allowance for growth in benefits and values	2%



## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

### Appendix A Spreadsheet Business Case Model

<b>Value of Tourism 2017</b>					
	<b>Stroud</b>				
	Key Facts				
<b>255600</b>	Staying visitor trips				
742000	Staying visitor nights				
£47,030,000	Staying visitor spend	<b>Ave Staying Visitor spend:</b>	<b>£184.00</b>		
<b>2667000</b>	Day visits				
£88,776,000	Day visitor spend	<b>Ave Day Visitor Spend:</b>	<b>£33.29</b>		
£135,806,000	Direct visitor spend		2021	2025	2028
£6,429,000	Other related spend		Phase 1/2	Phase 3/4	Phase 5
£142,235,000	TOTAL VISITOR RELATED SPEND	<b><i>Assumed uplift in Stroud Tourism due to VoBR:</i></b>	<b><i>0.3%</i></b>	<b><i>0.8%</i></b>	<b><i>1.5%</i></b>
£181,522,000	TOTAL BUSINESS TURNOVER SUPPORTED				
3020	Estimated actual employment	Additional:			
2238	FTE employment	Staying Visitor Trips:	843	1917	3834
5%	% Proportion of all employment	Day Visitor Trips:	8801	20003	40005

**RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE**

Appendix A Spreadsheet Business Case Model

**APPENDIX B**  
**Timetabling Modelling Report**

## Appendix B TIMETABLE MODELLING REPORT



# Sharpness Branch Line Timetable Study

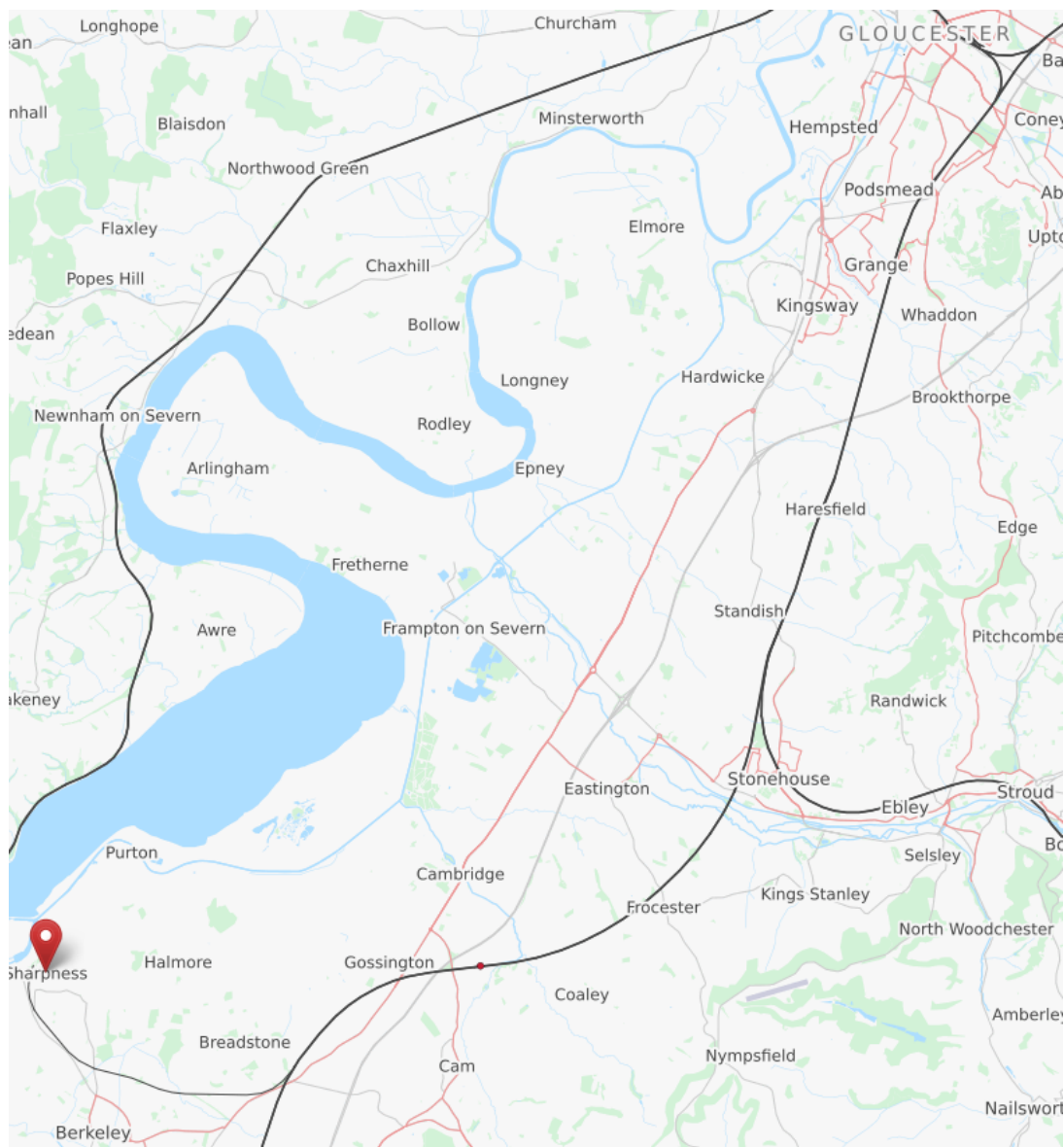
DOCUMENT CONTROL	
Project Title	Sharpness Branch Line Timetable Study
Author(s)	Ed Jeffery
Version Number	0.1
Status	Draft
Date	14/10/2020
Client	Network Rail

Version Number	Date	Issued By	Reason
0.1	14/10/2020	Ed Jeffery	First draft

## • Introduction

### • Background

The Sharpness Branch Line leaves the Bristol – Birmingham Main Line at Berkeley Road Junction (*Figure 1*). Since passenger services were withdrawn in 1964, it has been used only for freight, and is maintained and operated as a freight-only line. Current traffic is typically only one train per week, associated with the decommissioning of Berkeley Nuclear Power Station.



• *Figure 1: Sharpness Branch Line (highlighted bottom left). From OpenStreetMap*

Land alongside the branch line has been identified as a location for up to 5000 new homes (2400 before 2040). To support this development, it is proposed to reintroduce passenger services onto the route with either a 1 train per hour (tph) or a 2 tph service to Gloucester, calling at Cam & Dursley station to provide interchange onto services to Bristol.

- **Aim of analysis**

The purpose of this report is to undertake a high-level timetable study to identify:

- How a service between Sharpness and Gloucester would operate, identifying any operational constraints and impacts on any other services
- Identify any infrastructure requirements
- Identify possible connectional opportunities to Bristol

- **Key Assumptions**

- ***Infrastructure***

The base infrastructure is assumed to be that in place to operate the May 2020 timetable. Two options for the Sharpness Branch are considered:

- **“Do Minimum”**: branch line speed of 25mph and crossover speed at Berkeley Road Junction of 20mph
- **“Do Something”**: branch line speed of 50mph and crossover speed at Berkeley Road Junction of 40mph

In both cases, it is assumed that the signalling on the branch line is upgraded to passenger standards but would still only allow operation of one train on the branch at any time.

- ***Timetabling***

The May 2020 timetable (as planned rather than the amended COVID-19 service) is used as the base for this work. An 0700-1100 time period has been considered.

The geographical scope of the work is from Westerleigh Junction (at the Bristol end) to Gloucester, including the Sharpness Branch Line.

Two committed service changes have been included in the timetable (before the Sharpness trains were added).

### **MetroWest**

Phase 2 of the MetroWest scheme includes a possible increase in the stopping service levels on the route between Bristol and Gloucester to 2 tph (i.e. a doubling of the existing service). Timetable development work on MetroWest is not available for inclusion into this study, but Network Rail have provided the following assumptions:

- The existing Bristol – Gloucester service is extended to Worcester (in the hours where it does not do so today)
- A second Bristol – Gloucester service is added, as close to half-hourly as possible to the existing train. This is assumed to also call at Yate and Cam & Dursley

These changes have been incorporated into the timetable used in this study. However, there may ultimately be differences between the way the services have been assumed to operate here and the final outputs of the scheme. These assumptions are therefore suitable for a high-level study such as the one considered here, but more detailed assumptions (such as a proposed timetable) will be needed before any further timetable development work is undertaken for future stages of this work.

### **Transport for Wales**

The Transport for Wales Maesteg / Cardiff – Cheltenham Spa service is assumed to increase from broadly one train every two hours to hourly as part of the current franchise commitments. This has been achieved by adding additional trains in the same timings in the hours when they do not currently operate.

- ***Timetable Planning Rules***

The Timetable Planning Rules (TPR) is a document produced by Network Rail which specifies the values (such as headways, junction margins, dwell times etc.) to be used when planning a timetable. The current (2020) TPRs have been used for this study (except where noted in section 2), with the addition of all trains being timed at Berkeley Road Junction to better identify any potential issues with trains crossing onto the Sharpness Branch (running times for existing services have been proportionately estimated, and standard Western Region junction margins have been applied).

## • Findings

### • Running Times

To build a timetable, train running times on the changed infrastructure are required. These have been estimated at a high level using a RailSys Model. RailSys is a simulation tool which is widely used by Network Rail and the rail industry for, amongst other purposes, calculating train running times. A full model validation has not been undertaken due to the early stage of the project, so these values should be treated as approximate (but appropriate for the level of project development).

The rolling stock used for the new service is assumed to be Class 165. Estimated running times for the branch line are shown in *Table 1*. It can therefore be seen that the theoretical journey times for the 'Do Something' option are around 4.5 – 5 minutes better than for the 'Do Minimum' option.

Section	Type	'Do Minimum' (minutes)	'Do Something' (minutes)
Sharpness – Berkeley Road Junction	Start/pass	9.5	5.0
Berkeley Road Junction – Cam & Dursley	Pass/stop	3.0	2.5
Cam & Dursley – Berkeley Road Junction	Start/pass	3.5	3.5
Berkeley Road Junction - Sharpness	Pass/stop	9.5	5.0

• *Table 1: Proposed Running Times*

Class 165 running times do not currently exist for most of the route between Cam & Dursley and Gloucester. However, a test using the RailSys model showed that the running times are similar to existing Class 158 timings (which has similar performance characteristics and top speed). Therefore, Class 158 timings are used for this section.



- **Identification of Main Line paths**

One of the key constraints to operating the service is fitting trains on the main line in between the existing services.

Typical passenger timings for the *Bristol – Birmingham* direction are shown in *Table 2*.

	Bristol – Worcester	Bristol – Manchester	MetroWest (new train)	Plymouth – Scotland	London – Cheltenham
Berkeley Road Jn	1008 ½ (pass)	1023 (pass)	1038 (pass)	1057 ½ (pass)	
Cam & Dursley	1011 (stop)		1041 (stop)		
Standish Jn	1016 ½ (pass)	1028 (pass)	1046 ½ (pass)	1102 ½ (pass)	1106 (pass)
Gloucester Yard Jn	1023 (pass)	1032 ½ (pass)	1054 (pass)	1107 (pass)	1112 (pass)

• *Table 2: Example standard hour Bristol - Gloucester timetable*

Based on examination of the timetable, the following timetable opportunities (paths) are available for the new service (based on provided assumptions):

1. **Between the Bristol – Worcester & Bristol – Manchester train.** Although possible, this would involve running the Sharpness train immediately behind the existing stopping train. Although possible, the gap in front of the following Manchester train is small and would not be suitable if the Bristol – Worcester train has additional pathing time approaching Gloucester (as it usually does)
2. **Between the Bristol – Manchester & MetroWest train.** This is the largest timetable gap and has sufficient time to space the Sharpness train away from the MetroWest train (and also accommodate a freight path in some hours)
3. **Between the MetroWest train & Plymouth – Scotland train.** This gap also suitable (although noting that the gap on the opposite half hour is not suitable, meaning this could not be used for a 2 tph service)
4. **Between the Plymouth – Scotland & Bristol – Worcester train.** This gap is also suitable, and there is a suitable gap for a 2 tph service in the opposite half hour

Therefore, timetable opportunities 2 and 4 are the most suitable. This would involve passing Berkeley Road Junction at around xx.32 – xx.33 / xx.02 – xx.03 and arriving at Gloucester at around xx.24 and xx.54

Repeating the exercise for the opposite direction shows the standard timings shown in *Table 3*.

	MetroWest (new train)	Cheltenham – London	Manchester – Bristol	Worcester – Bristol	Scotland – Plymouth
Gloucester Yard Jn	1010 ½ (pass)	1015 (pass)	1035 (pass)	1044 (pass)	1057 ½ (pass)
Standish Jn	1016 (pass)	1020 ½ (pass)	1039 (pass)	1049 (pass)	1101 ½ (pass)
Cam & Dursley	1021 (stop)			1054 (stop)	
Berkeley Road Junction	1024 (pass)		1043 ½ (pass)	1057 (pass)	1105 ½ (pass)

• *Table 3: Example standard hour Gloucester - Bristol timetable*

There are again four possible timetable opportunities (based on provided assumptions):

1. **Between MetroWest & Manchester – Bristol.** This path is possible at the Gloucester end provided the Sharpness train follows the Cheltenham – London train departing Worcester. However, the train will pass Berkeley Road Junction at around the same time as the opposite direction MetroWest train
2. **Between Manchester – Bristol & Worcester – Bristol.** This path is also possible (although it is and works at Berkeley Road Junction
3. **Between Worcester – Bristol & Scotland – Plymouth.** This path is possible and also works at Berkeley Road Junction, although the timetable gap is small as the following Plymouth train catches up the stopping train in front
4. **Between Scotland – Plymouth and MetroWest.** This path is possible and also works at Berkeley Road Junction

Therefore, paths 2 and 4 are the best opportunities to operate a 2 tph service. This would not be an exact half-hourly service due to the Cheltenham – London train causing the MetroWest service to also not be able to operate exactly half-hourly from the current trains, but departures at around xx.01 and xx.34 would be possible.

### • **Constructing a through timetable: Gloucester station**

Another key constraint is the ability of trains to be accommodated at Gloucester station. Although the station has three platforms, the track layout and signalling is not very flexible and constrains how trains can be accommodated.

Considering the first pair of trains, the train from Sharpness would arrive at xx.54 and depart at xx.01. There is no current Timetable Planning Rules minimum turnround time specified for trains from Sharpness, but a 7-minute turnround is reasonable given the relatively short length of journey from Sharpness. The other pair of trains could potentially have a 10-minute turnround.

An extract of half an hour around the time of the first pair of trains at Gloucester station is shown in *Figure 2* (rows represent time and the columns represent each platform or through running line; trains are shown as coloured blocks).

	1	2	UML	URL	4
09:46					
09:47					
09:48					Nottm. 1M01
09:49					
09:50		2Z50			
09:51		Cheltenham			
09:52		Maesteg			
09:53					
09:54	2S00				
09:55	Sharpness				
09:56					
09:57					
09:58					2Z80
09:59					Bristol
10:00	Sharpness				
10:01	2S10				
10:02					
10:03					
10:04					
10:05					
10:06		1L70			
10:07		Cheltenham			Bristol
10:08					2Z90
10:09					
10:10					
10:11					
10:12		Padd.			
10:13		1L70			

• *Figure 2: Gloucester Platforming Extract*

It can be seen that the Sharpness train follows the Cheltenham – Maesteg train into the station, waits for 7 minutes and then returns after the additional MetroWest train has arrived.

However, looking at the other train half an hour later shows a different picture (*Figure 3*).

	1	2	UML	URL	4
10:15	1G07 Padd.				Maesteg Cheltenham
10:16					
10:17					
10:18					
10:19					
10:20	Cheltenham 1G07				
10:21					
10:22					
10:23					
10:24		1V05 Nottm. Cardiff 1V05			
10:25					
10:26					
10:27					
10:28					
10:29					2E56 Westbury
10:30					
10:31					
10:32					
10:33		2076 Worcs.			Worcs. 2E56
10:34					
10:35					
10:36					
10:37					
10:38					
10:39					
10:40					
10:41		Weymouth 2076			
10:42					1M60

• *Figure 3: Gloucester Platforming Extract*

An arrival about xx.24 would be at the same time as the train from Nottingham (shown in grey) arrives; this is not possible as a train arriving into Platform 1 fouls the signalling overlap of a train arriving into Platform 2. If the Sharpness train arrives earlier, it will conflict with the Cheltenham train (in red) departing. If it arrives later, it will conflict with the arrival of the next train from Westbury (shown in green).

Therefore, there is no way to operate the second service at Gloucester, and no other suitable main line paths would provide a viable half-hourly service (section 2). Potential solutions to this are explored more in section 2.

- **Constructing a through timetable: Sharpness Branch**

- **'Do Minimum' infrastructure**

The results of extending the identified train paths onto the Sharpness Branch are shown in *Table 4*.

Location	Train 1	Train 2
Berkeley Road Jn (pass)	1017	1047
Sharpness (arrive)	1027	1057
Sharpness (depart)	1024	1054
Berkeley Road Jn (pass)	1033	1103

• *Table 4: Timings on the Sharpness Branch*

This shows that it is not possible to operate the service as the trains must pass somewhere on the branch line itself (as the arrival at 1027 is just after the previous train must have departed Sharpness).

In fact, this is a problem whenever a 2 tph service is operated on the 'Do Minimum' infrastructure. The running time between Berkeley Road Junction and Sharpness is 9 ½ minutes in each direction (19 minutes for a round trip); when a 5-minute turnround and a 3-minute junction margin at Berkeley Road Junction is added, this takes 27 minutes for a train to clear the branch. If a two train per hour service operates, this means the branch would be occupied for around 90% of the hour, which leads to two further issues:

- There would be little 'spare' time available to recover any late running, meaning performance is likely to be poor
- The timings are effectively fixed, meaning it is highly unlikely to be able to construct a timetable considering constraints on the main line and at Gloucester (as demonstrated here)

It could be possible to operate a 1 tph service. As the journey time is around 30 minutes in each direction (60 minutes total), to operate a 1 tph service would mean around a 38 – 40 minute turnround at Sharpness and 20 minutes at Gloucester.

However, this would have an impact on platforming at Gloucester and would be a poor use of resources.

**Therefore the 'Do Minimum' option is recommended to be discounted due to significant operational constraints.**

- **‘Do Something’ Infrastructure**

The results of extending the identified train paths onto the Sharpness Branch are shown in *Table 5*.

Location	Train 1	Train 2
Berkeley Road Jn (pass)	1017	1047
Sharpness (arrive)	1023	1053
Sharpness (depart)	1029	1059
Berkeley Road Jn (pass)	1034	1103

- *Table 5: Timings on the Sharpness Branch*

It can now be seen that with the ‘Do Something’ infrastructure, a 5 or 6-minute turnround can be provided at Sharpness. This will allow an hourly service to be efficiently operated with one rolling stock unit, or a doubling of service to 2 tph (assuming a solution at Gloucester can be found). There is also a 13 – 14 minute ‘window’ between conflicting movements off and on the branch at Berkeley Road Junction, meaning there is flexibility to adjust timings to fit main line paths and provide more performance robustness.

Journey times from Sharpness are around 26 minutes and to Sharpness are around 22 minutes (due to difference in running times in opposite directions, and additional pathing time allowance added to make the platforming work at Gloucester).

- **Connections**

The proposed timings at Cam & Dursley are as follows:

- Arrive from Sharpness: xx.06 /xx.36. Depart to Bristol at xx.21 / xx.54
- Arrive from Bristol: xx.40 / xx.10. Depart to Sharpness xx.47 / xx.14

This therefore provides a short 4 – 7 minute connection from Bristol and a 15 – 18 minute connection to Bristol.

- **Operation in other hours**

The timings described so far have been based on a timetable off-peak hour. Extension of the times to the full 0700 – 1100 time period has shown that:

- The existing *Bristol – Worcester* services move from the standard pattern slightly in both directions in the peak hours. Some of the proposed additional MetroWest services would also conflict with other non-standard services (such as the *Cheltenham – London* services in some hours)
- Sharpness services which would have potential issues are the 0701 departure from Gloucester (used by a non-standard *Gloucester – Bristol* train) and 0754 arrival at Gloucester (used by an assumed non-standard MetroWest train to maintain an even service interval)

However, in both cases the solution depends on the exact MetroWest timings. There is sufficient capacity to operate the service (as no significant service increment occurs in the peaks) but the precise details will need to be confirmed once the MetroWest timetable has been developed; adjustments to Sharpness trains or moving from non-standard timings may be required. However, for the purposes of this high-level analysis it can be stated that there should be no significant additional blockers to operating the service in the peak.

The route is also used by freight trains, although the level of booked service is very low. Looking across a Tuesday, Wednesday and Thursday during potential passenger operating times of 0600 – 2200, only five *Bristol – Cheltenham Spa* and one *Cheltenham Spa – Bristol* path was identified (and not all trains operate on the same day of the week).

The *Cheltenham Spa – Bristol* freight train does not interact with either the proposed additional MetroWest or Sharpness trains. Some of the *Bristol – Cheltenham Spa* trains do, but the timings of these trains are not consistent across the day. The conflicts in the 0700 – 1100 time period have been resolved by adjusting the times trains are looped at Charfield or the time spent in Gloucester New Yard as required (with entry / exit times in the study area consistent); it is therefore assumed that similar changes can be made throughout the day. There is sufficient additional capacity available to operate at least two freight paths in each direction, and it is therefore a matter of adjusting timings of trains into the appropriate paths. This will also need to be undertaken for the MetroWest scheme, regardless of any Sharpness service.

### • **Interventions at Gloucester**

The impact of the constraints at Gloucester station on the operation of the second path per hour is described in section 7.

Network Rail have supplied details of a potential Gloucester intervention which brings the No 1 Spur line into passenger use (Figure 4). Although this would provide a significant amount of additional flexibility at Gloucester, it would not resolve the specific issues identified stopping the operation of the 2 tph service.

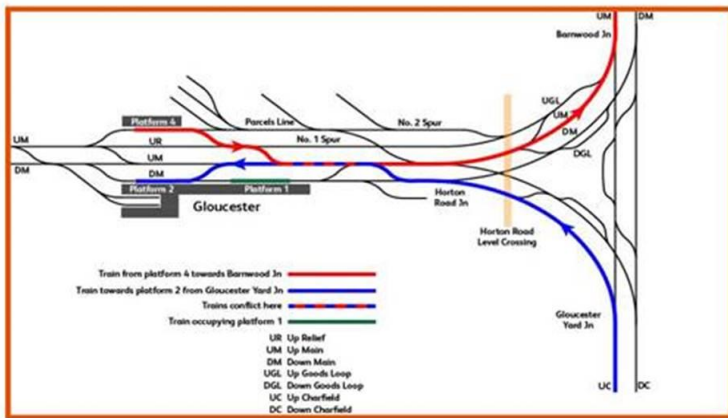


Figure D.3: Illustration of conflicts in the Gloucester station area

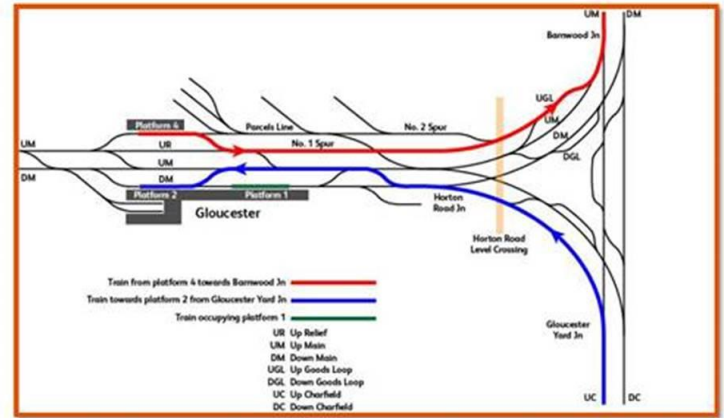


Figure D.4: Potential infrastructure intervention - No. 1 Spur useable by passenger services

### Figure 4: Network Rail potential Gloucester intervention

Potential solutions which could resolve the highlighted issues include:

- An additional platform (such as a bay platform facing towards Gloucester Yard Junction / Barnwood Junction to terminate or reverse trains)
- Additional crossovers to allow more movements to take place in parallel
- Splitting the platforms into shorter lengths
- Signalling changes to allow more movements in parallel (such as allowing a train into Platform 1 at the same time as a train arrives into Platform 2)

The last intervention is likely to be the simplest required to resolve the issues. This is also complementary to the potential Network Rail intervention:

- Currently, a train being routed along the Up Main from Cheltenham Spa into Platform 1 blocks any departure from Platform 4 and any arrival into Platform 2
- With the Network Rail intervention, one additional move can take place at the same time (a departure from Platform 4 towards Cheltenham Spa)
- With both interventions, one further additional move can take place at the same time (an arrival into Platform 2 from the south)

Therefore, where only one move can occur today, three moves would be able to occur at once enabling significant additional flexibility. It should be noted that the potential Network Rail intervention is not required for the second Sharpness train to operate.



## • Conclusions

This analysis has considered the reintroduction of passenger train services onto the Sharpness Branch Line, providing a 1 train per hour (tph) or 2 tph service to Gloucester. The study has considered an 0700 – 1100 time period based on the current timetable with additional MetroWest and *Cheltenham Spa – Cardiff* services overlaid on top.

Two branch line infrastructure options were considered; **‘Do Minimum’** (20mph junction and 25mph linespeed) and **‘Do Something’** (40mph junction and 50mph linespeed). The key findings are:

- The ‘Do Minimum’ infrastructure can only support 1 tph due to the length of time the branch line would be occupied each hour. However, even a 1 tph service would be constrained at the Gloucester end and would be an inefficient use of resources
- The ‘Do Something’ infrastructure could support a 1 tph service without any further interventions being necessary. This would be a more robust service and would be more efficient in terms of resources
- The ‘Do Something’ infrastructure could support a 2 tph service if additional infrastructure is provided at Gloucester. The simplest form of intervention would be signalling alterations to resolve overlap issues and allow parallel arrivals into Platforms 1 and 2. This would also be complementary to a potential intervention proposed by Network Rail

To summarise (including a high-level qualitative assessment of performance risk and operational efficient):

Infrastructure	Service Level	Feasible	Performance Risk	Operational Efficiency	Additional infrastructure
Do Minimum	1 tph	Yes			No
Do Minimum	2 tph	No			N/A
Do Something	1 tph	Yes			No
Do Something	2 tph	Yes			Gloucester

• *Table 6: Summary of findings*

The Do Something service has journey times of between 22 minutes (*Gloucester - Sharpness*) and 26 minutes (*Sharpness - Gloucester*); the difference is due to different running times and additional pathing time needed for platforming trains at Gloucester). Connections to and from Bristol are provided at Cam & Dursley of around 4 – 7 minutes in one direction and 15 – 18 minutes in the other.

The timetable developed has been replicated across the 0700 – 1100 time period. There are no significant blockers to operating the Sharpness service across this time period, but the precise details will depend on the exact timings of the MetroWest timetable (which will also need to factor in

constraints at the Bristol end). Although the level of freight traffic on the route is low, minor amendments will also need to be made where paths conflict (which are generally possible by adjusting looping times at Charfield and Gloucester New Yard); this is caused partially by the Sharpness service and partially by the new MetroWest service.

- **Recommendations and next steps**

This analysis has shown that there is no fundamental to operating a 1 tph service from *Sharpness - Gloucester* (or a 2 tph service with an appropriate intervention at Gloucester).

It is recommended that:

- The 'Do Minimum' option is discounted due to the operational and performance issues that may result, the extended journey times and the inability to ever operate a 2 tph service
- Allowance is made in the Sharpness project for one of the suggested interventions at Gloucester

This report has presented high-level findings. It is not possible to consider more detail at this stage due to the need to understand the interaction with the MetroWest trains; this is dependent on the timetable detail which is not currently available. This report therefore provides a 'proof of concept' and it is recommended that further, more detailed, work takes place at a later stage when more detail on MetroWest is available.

## RESTORING YOUR RAILWAY – SHARPNESS BRANCH LINE

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### • Appendix A: Proposed 1 tph timetable

The proposed standard 1 tph timetable based on the 'Do Something' infrastructure with no additional infrastructure is shown below.

	Bristol – Worcester	Bristol – Manchester	Sharpness (new train)	MetroWest (new train)	Plymouth – Scotland	London – Cheltenham
Sharpness			1028 (depart)			
Berkeley Road Jn	1008 ½ (pass)	1023 (pass)	1033 (pass)	1038 (pass)	1057 ½ (pass)	
Cam & Dursley	1011 (stop)		1036 (stop)	1041 (stop)		
Standish Jn	1016 ½ (pass)	1028 (pass)	1041 ½ (pass)	1046 ½ (pass)	1102 ½ (pass)	1106 (pass)
Gloucester Yard Jn	1023 (pass)	1032 ½ (pass)	1048 (pass)	1054 (pass)	1107 (pass)	1112 (pass)
Gloucester	1029 (arrive)		1054 (arrive)	1058 (arrive)		1115 (arrive)

	MetroWest (new train)	Cheltenham – London	Manchester – Bristol	Worcester – Bristol	Scotland – Plymouth	Sharpness (new train)
Gloucester	1008 (depart)	1012 ½ (depart)		1042 (depart)		1101 (depart)
Gloucester Yard Jn	1010 ½ (pass)	1015 (pass)	1035 (pass)	1044 (pass)	1057 ½ (pass)	1103 ½ (pass)
Standish Jn	1016 (pass)	1020 ½ (pass)	1039 (pass)	1049 (pass)	1101 ½ (pass)	1109 (pass)
Cam & Dursley	1021 (stop)			1054 (stop)		1114 (depart)
Berkeley Road Junction	1024 (pass)		1043 ½ (pass)	1057 (pass)	1105 ½ (pass)	1117 ½ (pass)
Sharpness						1123 (arrive)

