

**Bradley Canal**

**CRT Bradley Workshop to Moorcroft Junction**

**Restoration Feasibility Study**

**Canal and River Trust  
West Midlands Waterway Partnership  
2015**



**Moss Naylor Young**

# Bradley Canal

## CRT Bradley Workshop to Moorcroft Junction Restoration Feasibility Study

### Client and Funding

Client: Canal and River Trust / West Midlands Waterway Partnership

Funded by:

Canal and River Trust

Inland Waterways Association – Restoration Committee

Inland Waterways Association – West Midland Region/Birmingham, Black Country and Worcs Branch

Birmingham and Black Country Wildlife Trust – Nature Improvement Area Fund

Birmingham Canal Navigations Society

*This project has been supported by Defra, DCLG, Environment Agency, Forestry Commission and Natural England’.*



© This report is shared copyright between Moss Naylor Young Limited and those funding the report.

# Bradley Canal

## CRT Bradley Workshop to Moorcroft Junction Restoration Feasibility Study

### Preparation and Issue of report

Prepared by Moss Naylor Young on Behalf of the Canal and River Trust and the West Midlands Waterway Partnership

This report has been prepared by the following individuals

Patrick Moss  
Jennifer Smith  
Debbie Taylor  
Tamarisk Kay  
Sara Coffield

And authorised for Issue by

Patrick Moss

© This report is shared copyright between Moss Naylor Young Limited and those funding the report.

**Moss** Naylor Young Limited  
5 Oakdene Gardens  
Marple  
Stockport  
SK6 6PN

*Town Planning, Transport Planning, Waterway Regeneration*

1. Introduction .....	1
2. Brief History of the Bradley Locks Canal Route .....	3
3. Policy Review .....	6
4. Restoring the canal .....	15
5. Benefits .....	34
6. Biodiversity and Habitats .....	44
7. Funding .....	50
8. SWOT Analysis of Restoration .....	54
9. Conclusions and Recommendations .....	55

**Eco-record information and the main maps/diagrams for the report are included in a separate annex document.**

## 1. Introduction

Moss Naylor Young Limited has been commissioned by the Canal and River Trust / West Midlands Waterway Partnership to investigate the feasibility of restoring the Bradley Locks Branch and part of the Wednesbury Oak Loop of the Birmingham Canal Main line. The proposal is to restore navigation between the present terminus of the Wednesbury Oak Loop Canal at CRT Bradley Workshop and the Walsall Canal Main Line at Moorcroft Junction. The history of this length of canal is complex and for the purposes of this report the length proposed for restoration is generally referred to as the “Bradley Canal”: this is not intended as a marketing device but simply to avoid confusion around naming relating to this section of canal.

The Bradley Canal actually consists of several components, the history of which is briefly described later. The length subject to this proposal stretches from the point at which Bradley Lane crosses the Wednesbury Oak Loop of the BCN and Moorcroft Junction. The length itself was built in four different stages, the combined effect of which was to create a through route between the Wolverhampton Level of the Birmingham Canal Main Line and the Walsall Level of the Walsall canal. The length is about 2 kilometres/1.5 miles and has a descent of 9 locks. Currently it is possible to take a boat from one end of the Bradley Canal to the other using two routes: the first, via Tipton, encompasses 9 miles and 11 locks, the second, via Wolverhampton, is 17 miles and 8 locks. The Bradley Canal not only offers a more direct route between these points it also forms a much more direct route between the top of the locks in Wolverhampton and the Tame Valley Canal which leaves the Walsall Canal near Moorcroft Junction, thus creating a new route across the Black Country for boats.

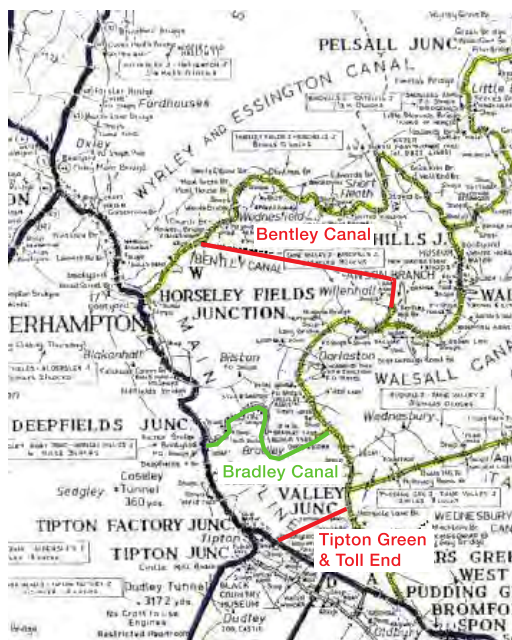


Figure 1: Bradley Canal and Surrounding Areas

The Bradley Canal was closed in the 1950's and has since been infilled with the exception of the bottom two locks and the final reach to the Walsall Canal. The remaining portion of the Wednesbury Oak Loop has survived, because it was needed to transport water from Bradley pumps, and because it serves a maintenance depot at Bradley Lane which still operates today.

Whilst the line of the canal remains protected and free of development, the road bridge which takes Bradley Lane over the canal near the Bradley Depot has been lowered, reopening this branch will therefore require changes in either the existing highway configuration, or the canal alignment, or both, at this location.

One feature of this proposal is that it is not solely, or even primarily, driven by a simple desire to reinstate navigation. The proposal was originally put to Moss Naylor Young by the Birmingham and Black Country Wildlife Trust (BBCWT) as a multi-faceted project that could deliver wildlife and habitat enhancements, urban regeneration benefits, water supply and management solutions, land-based recreation, heritage restoration, interpretation, and general educational benefits. To optimise these

benefits the canal would be restored to navigation, creating an active and managed waterfront that would present further opportunities for the boating and waterways communities.

### **Bradley Locks Context**

The site of the Bradley Canal lies in the heart of the Black Country, an area to the west of Birmingham which makes up the western part of the West Midlands metropolitan area. Formed of the Boroughs of Dudley, Sandwell, Walsall and the City of Wolverhampton; the Black Country is a polycentric urban area that lies at the heart of the west midlands transport hub and is home to a diverse population of over 1.8m people. Overall, Black Country residents are considered to be more deprived than the UK average although this varies across the area. The same can be said for health, with lower levels of participation in sport and regular exercise than the rest of the UK.

The Black Country today is very much a product of its industrial past. As the area which pioneered the urbanisation that accompanied the industrial revolution it has a special place in UK, and world, history. Once seen as the ‘workshop of the world’ the industrial past is still very much part of the areas image and identity. The changing economic situation and decline in heavy manufacturing has resulted in a number of other post-industrial challenges including the abandonment of many canals and railway lines. Despite this, these abandoned areas now provide significant opportunities for reversing decline, repairing environmental damage and creating more healthy and sustainable communities where people have attractive leisure and recreational facilities that are accessible to all members of the community.

### **Structure of the report**

After a comprehensive review of the development plan policy framework, the engineering technicalities of restoration are addressed. This is followed by a review of potential benefits, including economic assessment, as well as suggestions as to how incremental benefits can be maximised.

The study draws on a range of UK research case studies, evidence gathered during three site visits, as well as first-hand experience of canal restoration projects to provide a balanced and practical view on the best way forward. Discussions with officers from the relevant local planning authorities has confirmed what development is likely to be feasible in this area. The document concludes by providing an overall analysis of the project.

## 2. Brief History of the Bradley Locks Canal Route

The Birmingham Canal Navigations (BCN) as they are today started with the authorisation and construction of the Birmingham Canal Main Line, completed in 1772, between Birmingham and the Staffordshire and Worcestershire Canal at Wolverhampton. The original Main Line from Birmingham was added to by the construction of the Wyrley and Essington Canal in 1797, from Wolverhampton to the collieries on Cannock Chase via Walsall, and the Walsall Canal from the Birmingham Canal at Ryders Green (near West Bromwich) to Walsall which was completed in 1800.

The Birmingham Canal Main Line was heavily modified in the 1830's, resulting in two parallel lines for around 6 miles around Oldbury and Tipton, and a large loop being cut off that became known as the Wednesbury Oak Loop, today this loop survives in part from the main line at Deepfields Junction to Bradley Lane.

When the BCN Company and the Wyrley and Essington Company merged in the 1830's a number of connections between them were made, most notably the flight of locks at Walsall connecting two canals that were less than a mile apart but separated vertically by a rise of 64 feet. The Walsall Canal and the Birmingham Main Line were already linked not only at Ryders Green, where the two met, but via the Tipton Green and Toll End Communication canal. Further links between the Wolverhampton Level and the Walsall Canal were built at Rushall and Bentley. The Bradley Locks route was thus one of six directly linking the two levels in the second half of the 19<sup>th</sup> century. Of these, only Ryders Green, Walsall Locks and Rushall Locks survive. The Toll Green route and the Bentley route now lie under modern developments at least in part and are probably beyond recovery as navigations.

Starting from Bradley Lane the Bradley Canal is initially a continuation of the Wednesbury Oak Loop of the Birmingham Canal. This stretch was opened in 1770 as part of the Main Line, and was bypassed by the building of the new route through Coseley Tunnel in the 1830's. The Loop itself was shortened sometime prior to 1849 with a straight cut across the valley sometimes known as the Rotton Brunt Line. It was from this line that the flight of locks known as Bradley Locks descended.



Figure 2: Historic Map of the Birmingham Canal Navigations including the Bradley Canal

At the other end, the Walsall Canal had been completed as far as Moxley in the 1790's, and in 1796 a branch was built to Bradley Hall colliery. This created a situation whereby the Bradley Hall branch terminated less than a mile from the then main line of the BCN, but the two were not connected. In 1849 a flight of six locks was built to connect the two, completing the route. Thus the route referred to as the Bradley Locks canal was built in four separate stages in 1770, 1796, and the 1840's.

It is also worth noting that, on the abandoned length there was once a further branch just south of Bradley Lane, leading east down a two rise staircase lock to works at Bradley Marr. The branch was private and had opened by 1801, it is not clear when it closed. Comparing historic maps with modern sources it is possible to identify that this short dead end probably now lies in private development and there is no obvious trace on the ground. However for completeness reference is included here.

The whole of the Birmingham Canal Navigations has a place in national, if not international, canal history as surely the most dense network of industrial canals anywhere. They are also significant for being so high above sea level; the entire system is over 400 feet above sea level. The reason for such early development of the Birmingham Main Line was that Birmingham and the Black Country were not well located for navigable rivers.

The Locks themselves represent a particular stage in the technological development of English Canals in general and The Birmingham Canal Navigations in particular. Both the Rotton Brunt Line and the new locks at Bradley were built on dead straight alignments, ignoring any minor changes in the contour and taking the most time-efficient route. The locks were amongst the last on the BCN to have a single gate at top and bottom, the original Birmingham Canal Locks had double bottom gates as did the last the BCN Company built at Rushall and Perry Barr. The lagoons alongside each lock were a device to maximise water capacity in the short intervening pounds, and finally, the locks themselves are all at one side of the canal, not located midstream as earlier locks were. It is thought that this feature, which is shared by the locks at Oldbury and Perry Barr, was to make subsequent duplication straightforward. Thus restoring the locks allows access to and understanding of a particular phase of canal development.





Figure 3: Bradley Locks, Top Lock



Figure 4: Bradley Lock 7 and Great Bridge Crossing circa 1960

### **3. Policy Review**

Any development taking place within the UK must comply with the Proposals and Policies of Land Use Planning System. As restoration of the locks will require a significant amount of development, which would lead to potential changes of use for the site, proposals must comply with the regulatory framework for the site set by the planning system.

This section provides a review of the planning policy framework that is used to guide development decisions within the Black Country and more specifically the Bradley Locks site. A brief review of national planning policy (with which all policy must comply) is followed by analysis of the Black Country Core Strategy and subsequent statutory, and relevant emerging, land use allocation documents for each of the authorities through which the canal and towpath run, namely Wolverhampton, Walsall and Sandwell.

#### **The National Planning Policy Framework - Department for Communities and Local Government, March 2012**

The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied when writing local planning documents and making decisions regarding land use and development.

The document clearly states that the overall purpose of the planning system is to achieve sustainable development. A number of core planning principles are identified, those which are of relevance to this project include:

- promoting mixed use developments, encouraging multiple benefits from the use of land whilst recognising some open land can perform many functions (including for wildlife and recreation)
- conserving heritage assets in a manner appropriate to their significance so that they can be enjoyed and add to the quality of life for this and future generations
- supporting local strategies to improve health, social and cultural wellbeing for all
- proactively driving and supporting sustainable economic development
- seeking high quality design and a good standard of amenity
- accounting for the different roles and character of areas and promoting urban vitality
- conserving and enhancing the natural environment

Restoration of the Bradley Locks branch would fulfil a number of the core planning policy principles as long as proposals do not cause any adverse risk of flooding and that they ensure accessibility to all members of the community via a range of sustainable transport modes. Indeed, the document notes that access to high quality open spaces can make an important contribution to the health and wellbeing of communities; as such Local Authorities should seek opportunities to provide better facilities by enhancing rights of way and linking existing networks. Given that the site lies within an area of relative deprivation where many members of the community suffer from poor health, a development which would enhance the existing open space and encourage greater levels of exercise would be encouraged.

The document also suggests the planning system should contribute to and enhance the environment by providing net gains in biodiversity where possible, and that Local Planning authorities should

recognise that heritage assets are an irreplaceable resource and so positively plan for the conservation and enjoyment of the historic environment. This could include putting them to viable uses consistent with conservation, something which can assist in creating sustainable communities.

### **The Black Country Core Strategy, February 2011**

The Black Country Core Strategy (BCSS) is a spatial planning document which sets out how the Black Country should look in 2026, and identifies clear directions for change in order to achieve this. Produced jointly between the four Local Authorities of Dudley, Sandwell, Walsall and Wolverhampton, the Strategy is the key document that will guide and coordinate development decisions across the Black Country. At the heart of the Strategy is a series of regeneration corridors and strategic centres where change will be focused in order to achieve the visions of creating sustainable communities, environmental transformation and economic prosperity.

To help achieve the vision a series of 10 objectives have been developed, of particular note is objective 6 which aims to deliver

*A high quality environment fit for the future, and a strong Urban Park focussed on beacons, corridors and communities; respecting, protecting and enhancing the unique biodiversity and geodiversity of the Black Country and making the most of its assets whilst valuing its local character and industrial legacy.*

Accompanying the 10 objectives is a series of Strategic Policies, which will be used to guide development and enable change, these include:

**CPS 1, The Growth Network** – which highlights the role of regeneration corridors in providing sustainable and accessible mixed use development. (This includes enhancing the canal corridors within the Loxdale to Moxley Regeneration Corridor to improve sustainable access to areas of open space).

**CPS3, Environmental Infrastructure** – which requires development proposals to demonstrate that the strategic network of environmental infrastructure (including open spaces, canals and wildlife corridors) will be protected, enhanced and expended at every opportunity.

**CPS4, Place making** – which notes that the Black Country has a unique heritage and urban structure that requires high quality design which demonstrates a clear understanding of the historic character of the area. The protection and enhancement of the historic canal network should provide a unifying characteristic of the Black Country's urban structure and add to an integrated open space network that provides space for wildlife and informal recreation for local people.

Throughout the BCCS the canal network is seen as a distinct part of the areas unique industrial heritage, which provides character and sense of place. The document wholeheartedly supports opportunities for enhancement of the canal network to facilitate environmental improvement and provide recreational opportunities that would enhance health and wellbeing. Indeed, canals are seen to be of such significance that this strategic document has a policy dedicated to them - which will be the key policy across all three Local Authorities in any development decision about the Bradley Canal site:

**Policy ENV 4, Canals** states that

*The Black Country canal network comprises the canals and their surrounding landscape corridors, designated and undesignated historic assets, character, settings, views and interrelationships. The canal network can provide a focus for future development through the potential to provide a high quality environment and accessibility. All development proposals likely to affect the canal network must:*

- *safeguard the operation of a navigable and functional waterway;*
- *protect and enhance its special historic, architectural, archaeological and cultural interest (including potential to record, preserve and restore such features);*
- *protect and enhance its nature conservation value;*
- *protect and enhance its visual amenity;*
- *Protect and enhance water quality in the canal.*

*Where opportunities exist, all development proposals within the canal network must:*

- *enhance and promote its leisure, recreation and tourism value;*
- *improve and promote walking, cycling and boating access, including for freight;*
- *Promote beneficial and multifunctional use of the canal network.*

*Such development proposals must be fully supported by evidence that the above factors have been fully considered and properly incorporated into their design and layout. Where proposed development overlays part of the extensive network of disused canal features, the potential to record, preserve and restore such features must be fully explored. Development will not be permitted which would sever the route of a disused canal or prevent the restoration of a canal link where there is a realistic possibility of restoration, wholly or in part.*

Text accompanying the policy notes that the Black Country's canal network is one of the most defining historical and environmental assets which represents a significant stage in human history and as such there are aspirations for network to obtain UNESCO world heritage status. It has significant value for nature conservation, tourism and recreation. Preservation and enhancement is a major objective in the vision for environmental transformation and delivery of spatial objective 6. The network has the potential to make an important contribution to economic regeneration through the provision of high quality new environments for development and a network of pedestrian, cycle and water transport routes. However as only 54% of the historic network has survived in use, development proposals should consider the potential for restoration of disused sections of canal.

Throughout the BCCS there are a number of other policies which are of relevance to this study – all of which are outlined in Appendix A. Most notable of these are:

- **EMP6, Cultural Facilities and the Visitor Economy** – which recognises the canal network as a significant visitor attraction, that should be maintained and extended to help provide a network of linked facilities and visitor hubs, helping make the visitor economy a key growth sector.
- **TRAN4, Creating Coherent Networks for Cycling and for Walking** – which aims to create a comprehensive, safe and integrated cycle network. Enhancing, where possible, existing links including the canal network.
- **ENV1, Nature Conservation** – which aims to safeguard nature conservation and ensure the movement of wildlife through linear habitats.

- **ENV2, Historic Character and Local Distinctiveness** – which suggests that development should aim to promote the special qualities, historic character and local distinctiveness of the Black Country, including the canal network and its associated infrastructure.
- **ENV6, Open Space, Sport and Recreation** – which recognises the wide array of social, economic and environmental benefits provided by open space, including canals. Where appropriate the restoration of towpaths, bridges, public rights of way and the creation of cycle and pedestrian links will be sought via LTP funding, Safer Routes to School, British Waterways, Groundwork, Sustrans and planning obligations.

**Appendix 2** of the BCCS identifies aims and objectives for the Strategic Regeneration Corridors, including:

**Corridor 5 – Loxdale to Moxley**, which recognises the Walsall Canal, the Bradley Locks Branch and Moorcroft Wood Local Nature Reserve as positive features which should be built upon to help achieve the overall strategic aims for the corridor, and

**Corridor 4. Wolverhampton to Bilston** which aims to create sustainable and attractive communities focused along the metro route and canal corridor, served by open space networks and walking and cycling routes.

### **Local Authority Specific Planning Documents**

As noted above, the Bradley Locks canal site spans three Local Authorities, and as such is subject to a complex set of planning policy documents that form the overall planning policy framework for the site. The eastern part of the canal, south of Moorcroft Wood Local Nature Reserve forms the boundary between Walsall and Sandwell, whilst a small section of infilled canal, between the tram line and the A4098 fully falls within the Sandwell Borough. From the A4098 westwards, the canal runs along the boundary line between Sandwell and Wolverhampton, until it bends in a northerly direction at Wednesbury Oak, where it falls fully within the Wolverhampton boundary.

Given this complex situation it is highly important that all Authorities share the BCCS as their strategic statutory document to guide land use and development; however, it is also necessary to review the more detailed, site specific policies, for each authority which compose the entire planning policy framework for the site as follows:

### **Walsall Planning Policy Framework**

Walsall's current statutory planning policy framework comprises the BCCS combined with a number of 'saved' policies from the 2005 Unitary Development Plan (UDP). The Authority is also producing a Site Allocations Development Plan Document (SADPD) in line with the requirements of the new planning system. Although the SADPD is currently only at the issues and options consultation stage, and has no statutory status, it is worth consideration as, once adopted, it will form a key part of the Boroughs planning framework, replacing many policies in the existing UDP.

### **Walsall Unitary Development Plan 2005**

The UDP was adopted in 2005 and was set to cover the period to 2011; however, many of its policies have been saved until they are replaced by policies in other documents. Part 1 of the plan contains strategic policies, whilst part 2 contains more detailed policies and proposals about where particular types of development should take place.

Strategic Policies which are of relevance to proposals to restore the canal include:

- **Policy GP2, Environmental Protection** – which expects development to have a positive contribution to the quality of the environment and adhere to the principles of sustainable development (including implications for water resources), and
- **Policy GP6, Disabled People** – which states that leisure, recreation and community facilities will only be permitted if they are designed to provide good access for disabled people.

The UDP Proposals Map identifies the Bradley Locks site and environs as an Urban Open Space (under Policy LC1) and Greenway (LC5).

- **Policy LC1, Urban Open Space** – states that the Council will protect, maintain and enhance existing urban open spaces and readdress deficiencies in their provision or accessibility, recognising the variety of roles and functions they provide.
- **Policy LC5, Greenways** – suggests the greenway network will continue to be enhanced and safeguarded. The Bradley Canal site is also allocated as a Site of Importance for nature conservation and a local nature reserve; however, these policies have been replaced by those within the BCCS (see ENV1 of the BCCS).

There are a number of policies within the Environment Chapter of Part 2 of the UDP which are identified in Appendix A of this report. In general terms these policies aim to ensure new development does not have an adverse impact on the natural environment, including the supply of water and water resources, but rather seeks to enhance nature conservation, this includes provision for the creation of new habitats. The document also aims to ensure high quality landscape design and to protect and enhance the Boroughs industrial archaeology, including canals and associated structures.

Finally, it is worth noting that the document states that for planning proposals of particular significance, the Council will require the submission of an Environmental Statement in support of the application – this is likely to be the case for restoration of the canal.

#### *Walsall Site Allocations Issues and Options Document*

As noted above, the SADPD Issues and Options document is the first stage in the writing of a document that, once adopted, will eventually replace many policies in the existing UDP. Whilst this document does not yet have any statutory weight, by the time a planning application for restoration of the canal is submitted, it may do so. Consequently, it is only diligent to review its emerging policies, policy allocations and proposals.

Section 2.1 of the document highlights key issues for Walsall noting that protection and enhancement of Walsall's environment is a key consideration for SADPD. Urban green space will be expected to play a role in mitigating the potential impacts of climate change – important elements being canals and railway lines, which are distinctive features in the landscape and the paths of which provide an alternative transport network for walking and cycling. As the population of the borough is generally less prosperous and less healthy than the national average – opportunities here many therefore be seen as beneficial. Indeed Walsall's Green Space Strategy 2012-2017 sets a vision for putting green space at the heart of the Council's priorities to support communities, the economy, health and wellbeing, but notes that areas in the west of the Borough, (Including Willenhall) have

the lowest levels of provision and quality of green space, something which needs to be addressed alongside improving environmental assets and linking sites to form cohesive networks.

The canal network is described as one of the Borough's notable historic assets and most important environmental assets, providing greenways that offer opportunities for many different uses. In addition to maintaining its use as an operational waterway the SADPD will seek to protect and enhance the historic environment of the canal network, its water quality, nature conservation value (esp. its importance as a wildlife corridor), and its leisure and recreation value, by providing routes for walking and cycling. The SADPD notes that whilst increased usage by boats may impact upon biodiversity, this could provide opportunities for investment and encourage better maintenance of buildings and structures, whilst developments can benefit from waterfront locations – i.e. the importance of canals for economic regeneration if they are put to suitable use.

### **Sandwell Planning Policy Framework**

Sandwell's statutory planning policy framework for the Bradley Locks site comprises the BCCS and the formally adopted Site Allocations and Delivery DPD, 2012 which will guide development in the Borough until 2021.

### *Sandwell Site Allocations and Delivery DPD 2012*

The SADD strategy is based on the concentration of development within centres and regeneration corridors and a presumption in favour of sustainable development. It provides a series of local policies to cover issues not addressed in the BCCS.

Policies within the document aim to protect and enhance green spaces, ensuring adequate provision of local quality spaces for communities, including by promoting provision of environmental infrastructure within developments. Development that includes public access should have regard to the needs of disabled people, and so Design and Access Statements may be required as part of planning applications. Canals within Sandwell provide an accessible amenity resource for water sports and informal recreational activities, consequently the recreational use of suitable water features is supported, provided that there is no detrimental impact upon the nature conservation value of such sites.

There are a number of site specific policy allocations for and around the Bradley Canal site. The eastern stretch of the canal to the west of the tram line falls within an area identified as a **'Gateway' under Policy SAD DM5**, which aims to (amongst other things) ensure the topography of the area is emphasised and environmental infrastructure features are incorporated into the design of development.

The towpath to the south of this stretch of canal is identified as a Site of Local Importance for Nature Conservation (SLINC). Whilst there is no specific policy relating to this designation, this area will be subject to the principles of Environmental Infrastructure policies within the SADPD and BCCS. Additionally, open land to the south west of Batman's Hill, east of the Rocket Pool is identified as a potential new nature reserve. Again, whilst there is no specific policy relating to this, this allocation will be subject to environmental and nature conservation policies that should be considered as part of any development proposal. Finally, the SADPD acknowledges proposals to expand the Metro in the Black Country which will link to the existing route at Wednesbury; this means there will be improved access to the Bradley Locks site by a sustainable transport mode.

### **Wolverhampton Planning Policy Framework**

The statutory planning policy framework for Wolverhampton is formed of the BCCS and ‘saved’ policies from the Wolverhampton Unitary Development Plan, 2006. Additionally, the Bilston Corridor Area Action Plan (AAP), including Bilston Neighbourhood Plan, has been submitted to the Secretary of State for examination. When adopted, this document will also form part of the Council’s Local Plan to guide future development up to 2026.

### *Wolverhampton Unitary development Plan 2006*

Part 1 of the UDP identifies four key objectives:

- economic regeneration
- social inclusion
- protecting and enhancing the environment, and
- The prudent use of natural resources.

Each objective is followed by a number of strategic guiding principles; these include developing high quality environments and promoting conservation-led regeneration, by giving priority to historic buildings and archaeology, biodiversity and nature conservation resources.

Additionally, Part 1 of the plan also includes a number of Strategic (thematic) Policies which development must adhere to such as community safety, high quality design and access for those with disabilities. Those policies which are of most relevance to this study can be summarised as:

- **Policy HE1, Preservation of Local Character and Distinctiveness** – which recognises the contribution of the canal network and protected spaces in adding to the character of the local area
- **Policy N1: Promotion of Nature Conservation** – which seeks protection and enhancement of existing nature conservation resource, including the creation of new habitats and nature conservation features
- **Policy R1: Local Standards for Open Space, Sport and Recreation Facilities** – which seeks to ensure an adequate supply of good quality open spaces to meet recreational need, and
- **Policy IMR2: Planning Obligations and Agreements** – which states that in appropriate circumstances planning obligations will be negotiated with developers to enable development to proceed.

Having spoken to Wolverhampton Planning Department it was felt reasonable that any land needed to restore the canal could be provided as part of planning conditions if the authority were to grant permission to develop/redevelop surrounding areas. However, given the low value of development in the area it would be difficult to negotiate any extra provision such as funding a new cycle way, for the canal works themselves.

There are a number of relevant policy allocations in and around the canal site as identified on the UDP proposals map as follows:

The infilled canal is identified on the UDP proposals map and allocated under **Policy HE23: Bradley Arm of the Birmingham Canal**. This policy safeguards the canal from any development which would prejudice its possible future reinstatement as a canal link. Text accompanying the policy notes that



reinstatement of the former Bradley Arm of the Birmingham Canal Navigations may yield significant economic, tourism and recreation benefits and as such it is important to ensure that the line of this Canal is safeguarded to avoid prejudicing any future discussions that may take place regarding the feasibility and viability of reinstating the link.

Additionally, **Policy HE22: Protection and Enhancement of the Canal Network** applies to the entire canal network of Wolverhampton, and states that the council will work with partners to protect and enhance the historical, recreational and nature conservation value of the canal network and increase its attractiveness as both a local amenity and a tourist attraction. Text accompanying the policy notes that the canal network in Wolverhampton has many important functions. The network is a key local and regional recreational resource, catering for a wide variety of leisure interests and forms part of the Greenway Network with many shared use paths providing harmonious routes for pedestrians and cyclists. Canals are important wildlife corridors, some parts are valuable habitats that can also be of value for environmental education and tourism. Many parts of the network and associated features are of architectural, archaeological and historical significance. As such canal corridors, have the potential to play a major positive role in regeneration projects.

The entire area each side of the canal including Batman's Hill to the west of Rocket Pool is allocated as **Recreational Open Space under Policy R1** (as identified above) which seeks to protect and enhance areas of open space, ensure adequate provision and reduction in crime. Linked to this allocation, the UDP notes that many Canals serve as Greenways. **Policy R6: The Greenway Network** states that the Council will work with other agencies to extend and increase access to the Greenway network, enhance its value for recreation, education, sustainable transport and wildlife and realise its potential to facilitate regeneration.

Sections of the towpath are allocated under **Policy N5: Protection of Sites of Local Importance for Nature Conservation (SLINC)** which states that where a proposed development site includes or adjoins a SLINC or any landscape feature of value for wildlife, the council will seek the protection and long term management through the use of conditions, planning obligations or management agreements, where appropriate, and may require the submission of an ecological survey. This is reiterated in **Policy N3: Protection of Sites of Importance for Nature Conservation**.

There are a number of additional policies contained in Part 2 of the UDP which relate to the allocations identified above and/or are worthy of consideration which are identified in Appendix A. In summary these policies address: ensuring adequate access to natural green space, provision for pedestrians and cyclists, conserving nature, natural features and habitats, protecting groundwater, watercourses and canals, and ensuring development minimises consumption of water and maximising water recycling.

### **Bilston Corridor Area Action Plan**

The western stretch of the infilled canal running from Batman's Hill to Bradley lies within the area covered by the Bilston Corridor Area Action Plan – a document being produced by the City council as part of its Local Plan to guide future development up to 2026. The Corridor extends from the edge of Wolverhampton City Centre in the north, to Loxdale Industrial Area in the south, and is a key regeneration priority for the City.

Key policies and proposals in the AAP include delivering over 2,500 high quality new homes and protecting quality employment land, improving transport and other infrastructure, requiring protection and enhancement of heritage assets and delivering environmental improvements by identifying areas for public realm enhancement, nature conservation, and open space.

The line of the canal is identified on the Key Diagram. It runs through an area identified as Local Quality Employment Land and then into an area of Open Space near Batemans Hill. Conversations with Wolverhampton City Council planning department have indicated that this area of employment land is likely to be subject to redevelopment, however, they would be happy to include provision of the necessary land required to restore the canal, as part of any planning permission or development brief.

### **Conclusion**

In summary, the planning policy framework guiding development within the Bradley Canal site is generally supportive of proposals for restoration of the canal if it is done so in a manner which would enhance nature conservation and biodiversity, and provide opportunities for recreation through improvements to the amenity value of the existing open space. The canal system is recognised as an important landscape feature of the Black Country which adds character and distinctiveness to the local area. As such, proposals to restore and enhance this stretch of canal and distinct set of locks are supported by planning policy as long as they apply a sympathetic design which promotes public safety, avoids opportunities for crime, and ensures access for all users including those with disabilities.

### **Key Issues to Consider:**

- The possible need for 3 separate planning applications – one for each local authority.
- The need for an environmental statement to support any planning applications.
- The need for applications to include full details of landscaping measures and design – possibly via design and access statements.

Discussions with Local Planning Authorities have revealed it is unlikely planning obligations could be used to secure associated infrastructure such as improvements to the towpath, accessibility, and development of recreational and educational facilities.

## 4. Restoring the canal

### The existing Canal

For the purposes of this section the canal is described from Bradley Workshops to Moorcroft Junction: historically this length was built in at least four different stages as described elsewhere but for restoration is considered as a single entity.

The starting point at Bradley Lane is actually an arbitrary point on the Wednesbury Oak Loop of the Birmingham Canal Main Line. The canal is navigable to this point from Deepfields Junction, although not much navigated. Bradley Maintenance yard and a public house adjacent to the truncated canal terminus provide little incentive for the average leisure user to reach this point.



Figure 5: New lock gates at Bradley Yard

Bradley Lane is now rather lower than when the canal was open, which presents the first (and only substantial) obstacle to restoration. It is unlikely that it would be possible to put the original vertical alignment of the road back, as the crossing is at the top of a significant slope on Bradley Lane and the original bridge not only made this steeper but raised the crown of the slope above the existing summit. The road surface at present is approximately at water level so would need to be lifted at least 2.5 metres if a fixed bridge at present canal levels were to be installed.



Figure 6: End of navigable section, Bradley Lane

Between Bradley Lane and the site of the first lock the canal course is infilled but unobstructed. The service area of a number of industrial units is on the course of the canal and this use would need to be modified, relocated or otherwise removed for the canal to be re-established on its historic line. Interestingly, the present buildings, or ones very similar, can be seen on Google Earth for 1945 *with the canal still open past them*. Thus if relocation of the existing businesses were not to occur it may well be practical to modify the access arrangements to allow for a canal to be reinstated.

The land falls away rapidly away from the canal line and the building compound, following the same slope as Bradley Lane itself. Thus moving the canal sideways to avoid this area is not practical.



Figure 7: Industrial area, Bradley Lane

The site of the junction between the Rotton Brunt Line and the flight of locks is undeveloped but has no surviving features above ground. The line of the Rotton Brunt Line continues unobstructed as well and this could be used to create mooring opportunities as discussed elsewhere. The locks are infilled but show up as slopes in the landscaped area between modern housing developments. It is believed the locks and the stone towpath walls are all buried intact, although the gates were (probably) removed.

This infilled-but-intact character continues to the seventh lock, immediately below which Great Bridge Road crosses the canal. There is evidence that the arch of this bridge has been collapsed, presumably to remove a hump in the road, but when viewed from downstream it is apparent that the existing road level would still provide for navigable headroom. If there is a need to create a small increase in available height then the eighth lock is only a short distance away and a slight lowering the water level, either temporarily or permanently, would be straightforward.



Figure 8: Great Bridge Road arch

The canal below Great Bridge Street is clear but dry as far as the ninth lock. There is a small stream flowing down the centre of the channel and the pounds are overgrown but reinstatement here is primarily a clearance project not an excavation. Locks 8 and 9 were restored using HLF money and then appropriately filled in to preserve the brickwork in order to enable full restoration in the future.

Below the ninth lock the canal is level with the Walsall Canal and in water, although very overgrown. Japanese knotweed is also present on this length. In terms of engineering, this length simply needs dredging and clearance, although it should be noted that this is the only length of canal where the habitat within the canal bed will be significantly different to the surrounding area.



Figure 9: Lowest level to Walsall Canal

## Services and utilities

We have not carried out a formal services search: although there is a legal right to gain information from utility companies this is subject to a charge and the charges are not commensurate with the value to this study such a search would bring nor with the budget constraints of compiling this report. Whilst on site the project manager has made observations regarding services over the length of the canal from visible evidence such as access covers, evidence of works and disturbance and the physical presence of service conduits and apparatus.

There is occasional evidence of a pipe following the line of the old canal in the form of covers at the crossing of Bradley Lane and on the route of the canal down the former flight of locks. There are no obvious covers between Bradley Lane and the locks. It is likely that these covers give access to a drain along the canal line to replace the land drainage function that the canal would once have provided. There is no evidence of a feed from the Wolverhampton Level to the Walsall Level along the canal line

At Great Bridge Road there is evidence of services in the road and footway in the form of access covers and road/footway works and repairs. There is also a large pipe across the downstream face of the bridge. The pipe has navigational clearance and it is not clear whether it is still used in any event. Cable and Wireless covers indicate the presence of fibre optics but their presence in the footway indicates that these are not deep and it is unlikely that the bridge deck has been compromised – footway levels have not altered following closure of the canal so the presence of footway services per se is not a problem.

There is some local evidence of utilities for domestic properties coming to either side of the canal but not crossing it. This is in the form of repairs to the footway surface the end at the last residential property.

At Bradley Lane the road and footway level has been lowered and thus services within these potentially obstruct restoration. Most covers in this area relate to highway drainage and services but a cover labelled “Telewest” actually on the line of the canal, in the western footway, would suggest that fibre optic cables cross the route here. Fibre optic cables are normally installed with slack to allow localised shifting, as extending a cable is very expensive and operationally unsatisfactory. It is not known whether these cables have sufficient flexibility to allow for diversion. If not, then raising or lowering the canal is likely to be cheaper than rerouting the cable.

As these proposals are developed a full services search is recommended.

## **Recreating a navigable canal**

### **Crossing Bradley Lane**

Options:

#### **1. Take the canal to either side of the road**

The cheapest solution to the problem of traversing Bradley Lane is to simply take the canal to either side of the road itself and create two termini. Although this is technically feasible this arguably does not constitute restoration

From a navigation point of view bringing the canal to either side of the road would essentially produce a short, lock-heavy, branch line with no obvious destination at its terminus and would not increase the appeal of the existing branch. As shortish branches off even the busiest canals do not attract large numbers of boaters it is unlikely to become popular with the tourist contingent.

Other benefits of re-opening the canal would also likely be compromised if not lost completely. Terminating the canal at either side of the road limits the efficacy of the wildlife corridor created by the restoration as well as potentially affecting its popularity as an off-road cycle/pedestrian route due to the difficulty of crossing a busy road, particularly with small children.

Overall, whilst this option creates a navigable canal from Bradley Lane to Moorcroft, it does not create a through route and should be discounted.

#### **2. Close the road**

Closing the road would entail significant diversions for all road traffic motorised or not – it would also leave the canal route unobstructed for boats. However, whilst the highway authority and the local community may be persuaded to accept restrictions on crossing the canal in the form of wait times or weight limits complete severance is not likely to be acceptable. For pedestrians and cyclists a lightweight swing bridge could be installed although the canal route would then feature an obstruction that required user operation.

Given the comments made under the heading of “services” earlier in this report it is likely that utilities would be disturbed if the road were physically removed: these would have to be routed under the canal.

To physically remove the road we would need to get a "stopping up order" so the highway no longer existed as a legal entity. This would be subject to consultation and likely to attract strong objections - we can not guarantee that such an order would be made by the Highway Authority so we can not predicate the success of the scheme on closing the road. This option should not be pursued further at this stage.

#### **3. Lift Bridge – key and button operated**

The most obvious compromise is a moveable bridge that is normally open to traffic but is operated “on demand” by boat crews to allow passage along the canal. Given the character of Bradley Lane such a bridge would need to be electrically operated and would have a cycle time of around four minutes assuming boats made an efficient transit and were not in a



substantial convoy. Interlocks could be fitted to the bridge to prevent repeated operation within a given period of time or to prevent it operating during peak road traffic hours.

It should be noted that even a moveable bridge would require the highway surface to be raised by approximately 0.5 metres such that the bridge actually cleared the water level in the canal. In extremis, it would be possible to design a bridge that had the underside of the deck below water level, although clearly the road surface on the downhill side of the crossing would have to be above water level.

A swing or lift bridge would not really discourage through traffic although it would act as a slight deterrent to shorter trips that might head for the locks but not then descend them, as the bridge would have to be operated twice.

As with removing the road altogether, a moveable bridge is likely to disrupt services which would have to be routed under the canal, the cost of this is not known at present, although a notional allowance is made in the costings.

A moveable bridge does not assist the movement of pedestrians and cycles across the road on the towpath.

#### **4. Raise Road**

The situation at Bradley Lane has been created by the lowering of the road surface following closure of the canal, the original Tup Street Bridge having been demolished to ease the gradient for road traffic (historical note: although the bridge is on Bradley Lane it was known as Tup Street Bridge). Raising the levels as before would allow unobstructed navigation once again, and may allow for a towpath under the structure as well.

As a starting point, it is necessary to consider that the original lowering was done for a reason, and that changes may well have occurred since this time that may mitigate reinstatement of the original vertical alignment in any event. Taking the gradient issues. The highway, more or less level on the western side of the crossing has already started to fall at the historic bridging point, and will need raising by, say 0.5m even for the moveable bridge option. Raising by an addition two metres will require an approach ramp on both sides of the crossing. The maximum desirable gradient on an all purpose single carriageway (DMRB 2002) is 6%, or 1 in 17, on the level this would require approach ramps 34 metres long or thereabouts. On the east side of the crossing the road is already falling away from the crossing at a gradient of 4-5% (estimated on site and from OS maps) meaning the approach ramp would be very much longer, potentially upwards of 100 metres. Not only would this be expensive, but the approach ramp would be in front of a number of private residences that have driveways onto the road. Some of these private access points, especially nearer the bridge, would not be capable of adaptation, a factor that must be added to the impact on the enjoyment of the properties raising the road by over 2 metres would have.

Overall, from this preliminary assessment, we have concluded that raising the road to allow unrestricted navigation is not practical.

#### **5. Drop Canal Level**

This is actually two sub-options:

- a) Drop and stay dropped
- b) Drop and climb again

In order to assess the implications of either option it is necessary to identify how far the canal can be lowered and how far it needs to be lowered.

#### *Minimum viable headroom*

Purportedly the lowest tunnel on the network is Froghall Tunnel on the Caldon Canal, which requires your boat to be no larger than 52 inches (1.32 metres) high with a maximum cabin width at top of 66 inches (1.68 metres). Although this is, just about, navigable the skipper is unable to stand upright when traversing the tunnel and therefore it is not considered best practice (the tunnel in question was reopened in 2005, part of the restoration work involved dredging the pound to lower the water level and thus improve the headroom).

Headroom of around 2.2m seems a reasonable aim (based on the standard headroom here <https://canalrivertrust.org.uk/media/library/1059.pdf>) while CRT state that the minimum headroom on the network is 1.88m (6.17 ft) on Bridge 10 of the Caldon Canal (page 8 of the aforementioned document).

The level information available to the study team is not accurate enough to allow for fine tuning of available headroom, and this given that the existing crossing is approximately at water level (and falling to the east) we have assumed that the canal would need to be lowered by **at least** 2.5 metres and up to 3 metres if the road level is to remain unaltered. This allows for 2.2m clearance plus the depth of the bridge deck. In practice, as will be seen. The difference between 2.5 metres and 3 metres is a matter of degree and does not fundamentally affect the viability or otherwise of lowering the canal.

#### *Lowering the canal between Bradley Lane and Bradley Locks*

The canal at Bradley Lane is 64 feet higher than the canal at Moorcroft, as the fall of Bradley Locks is the same as that of Walsall Locks and Rushall Locks, both of which link the same two levels of water and are stated to be 64 feet. As there were nine locks at Bradley these had a fall of around 7.1 feet each (2.1 metres). Thus if the canal drops by a lock at Bradley Lane to gain headroom under the road then the top lock at Bradley will be redundant and the next one will have its fall reduced by between 0.1 metres and 0.8 metres (4 inches to 2 feet 7 inches), dependent on how far the canal is lowered in the range identified above.

There is an obvious implication for the restoration of Bradley Locks in that the top lock disappears and the second one may be materially affected. This report does not go into the detail of how much, if any, of the top lock should be retained in this instance, but the historic view from the top of the flight would not be recreated.

A more pressing concern is the volume of fill that must be removed and relocated. Assuming that the new canal corridor is 12 metres wide, and that the lowered alignment can be accommodated entirely at the edge of the level area and thus a slope is only required on the uphill side then approximately 25,000 cubic metres of fill would need to be removed. Using a rule of thumb of 2 tonnes per cubic metre this amounts to 50,000 tonnes of excavations.

There is of course a large open area adjacent to the canal that is currently open grassland used for grazing and other activities. A very rough estimate of the total area of this comes to around 160,000 square metres: the fill would still cover this to a level of around 0.15 metres. In addition the canal would be in cutting around the back of Humphries Crescent, part of the development around the Rocket Pool. This is not to say that this solution is impractical, but it is to say that a lot more detail is needed before any commitment is made to lowering the canal from Bradley Lane to Bradley Top Lock.

#### *Lowering the canal local to Bradley Lane*

This requires the canal to be lowered north of the Bradley Lane Crossing and then raised again. Two additional locks would be required to drop the approximately 6' required unless a scheme such as Dalmuir Drop Lock were adopted.

The simplest user operated scheme would be to have two conventional locks, one either side of the crossing. Boaters would then lock through as per any conventional locks but there would be no further impact on levels and issues regarding excavation, removal of fill and impact on the lock flight are avoided. There would need to be associated flood prevention systems in the bottom section to prevent floodwater (however it occurred) from reaching the soffit of the bridge: potentially this might occur through either user error or gate failure.

#### *Dalmuir Drop Lock*

One potential solution to the problem of navigating a busy road is demonstrated by Dalmuir Drop Lock on the Forth and Clyde Canal. Before closure in 1962 the A814 crossed the canal on a swing bridge, but reinstating this on an extremely busy road nearly 40 years later would have caused unacceptable delays therefore the decision was made to go with a more ingenious solution. Boats enter the lock on the same level as the canal, the water is then pumped out until sufficient head room is achieved (there is a maximum clearance of 10ft), at this point the safety barriers are raised allowing boats to pass under the road and, once they are safely on the other side, the barriers are lowered again allowing the water to be pumped back in.

This method, while novel, could produce a viable solution for navigating Bradley Lane. Downsides of such a scheme include the amount of electricity required to operate the pumps and the fact that the lock would only be operable by a lock keeper meaning it would either have to be manned during daylight hours or boats would have to book passage through the drop lock, which might reduce the likelihood of the canal being regularly navigated. (It should be noted that all the locks on the Forth and Clyde Canal are manned, so this is less of an issue)

#### *General note on lowering the canal*

Following services investigation it should be possible to lower the canal sufficiently to allow existing services to be unaffected, especially in the case of localised lowering as this option allows more flexibility over the level under Bradley Lane itself. If service diversions prove especially expensive, which with fibre optics they may, this may mean that localised lowering of the canal is the most cost effective option.

## **6. Hybrid drop canal and raise road**

One option which might be beneficial is the possibility of raising the road to reduce the amount by which the canal has to be lowered. It would need a detailed engineering study to determine how much the road might be raised by before the impact of new approach ramps becomes unacceptable, for the purposes of this study we have assumed the road might be raised far enough to allow the canal to be lowered by only one metre. This would result in a lock at Bradley Lane with a fall of one metre and a reduction in the fall of Bradley Top Lock of one metre.

The impact on excavation would be to reduce the requirement from 25,000 cubic metres to around 8,500 cubic metres, or 17,000 tonnes, and to reduce the depth of any cutting such that the impact on the landscape is less dramatic.

In navigation terms an extra lock would be introduced, and there would also be a need to consider supply to the lower eight locks given that these would now be deeper than the locks above them and thus the consume more water than is passed down the flight.

In theory this idea could also be applied to localised lowering of the level, making the droplock or the pair of locks shallower, however the benefits are more limited.

Finally, if the highway cannot be raised at all, a shallow lock will be necessary for a swing or lift bridge option, lowering the canal surface by enough to allow the bridge deck to be clear of the water, or at least to ensure that the downstream approach ramp is above water level. At this stage we have assume that this might entail a drop of around 0.5 metres at Bradley Lane.

This option will still potentially require service diversions

## **7. Divert Road**

Changing the horizontal alignment of the canal and the road might provide a means of achieving greater headroom in order to allow for a fixed crossing at the existing water level. Providing no other factors came into play, moving the canal crossing point east on Bradley Lane would mean crossing under the road at a point where the surface is higher than at the historic crossing. However, the industrial buildings to the north of the crossing site are new and will not become available for redevelopment in the foreseeable future so we have assumed the moving the canal or road through them is not an option.

The land to the south on the other hand is occupied by buildings which appear to be approaching the end of their useful life. Redevelopment of this site is a pre-requisite for restoring the canal in any event as there is currently no vacant corridor for the canal to pass along. If this redevelopment permitted a change in the alignment of the road such that more favourable gradients were achieved a fixed canal crossing at the existing water level may be achievable.

The latter scheme would require diversion of the road by about 200 yards to the south, re-joining the existing line at a right angle level with the an existing gap in the frontage. This scheme would, sadly, go well beyond the scope of any likely proposed redevelopment and

involves perhaps 750 metres of new road, which is grossly out of proportion with the scale of the project.

#### **8. Lifting boats over the road**

Two sub options:

- a) Aqueduct – would need to be very long
- b) Physically transfer the boat (and some water?) over the road.

#### *Parameters*

A fixed structure over the road would have to be in accordance with design guidelines in the DMRB unless otherwise agreed. The DMRB indicates that a highway bridge over a road must have a clearance in excess of 5.7 metres or must be built to withstand impact from a vehicle strike. In practice a canal aqueduct would also need to meet these criteria as a vehicle strike on a trough filled with water has potentially devastating consequences. A temporary obstruction at a lower height might be permissible if the traffic were stopped for a boat transit, however if this occurs it is difficult to see the benefits of this over a lift or swing bridge.

#### *Aqueduct*

An aqueduct would need to clear the road by 5.7 metres or be able to withstand vehicle impact. In practice clearance of around 5 metres is necessary anyway unless a restriction on the height of ordinary vehicles such as buses and large box lorries is approved.

An aqueduct trough with a soffit height of 5.7 metres above the road would have a water level approximately 2 metres higher than this, allowing for the floor of the trough and an adequate depth of water. This would make the water level 7.7 metres above the road, and by definition at least 7.7 metres above the existing water level.

It would be necessary to lift boats onto the aqueduct on either side: this could be done by locks or by a mechanical boat lift. Looking at each option

Each lock would have a rise and fall of 7.7 metres, or approximately 25 feet, making them comfortably the deepest locks on any inland waterway in Great Britain. The aqueduct would not hold enough water to fill these locks so each one would have to be filled by pumping. The most efficient transit of boats would require both locks to be full at the same time, meaning that the volume of water of both locks would be needed at once. Some efficiencies could be obtained by having one lock full and the other empty at any one time: the two locks could be linked by a pipe under the road allowing one to drain into the other to save pumping.

The depth of the chambers could be reduced by having two or more locks either side, however this would make the structure longer. It is probably impractical to fit a flight of locks in either side, and thus the series of locks would have to be a staircase.

A boat lift either side would remove the need for pumping water to raise the boats but would replace this with a need to lift a tank containing water and boat instead. The tank and the frame of the lift would be open so the experience would be less claustrophobic than a

7.7 metre deep lock. Calculations would be required to see whether the operation is more or less energy efficient than pumping water to fill a lock.

### *Transfer structure*

The boat lift and aqueduct idea could be taken to its logical conclusion by doing away with the aqueduct and having a single mechanical device to transfer boats from one side of the road to the other. At its simplest this could be a slipway and trolley arrangement on which boats could be slipped from the water on one side of the road, cross on the level and slipped back in on the other side, road traffic being stopped to achieve this. At the opposite extreme a tank full of water containing the boat might be lifted out and carried over the road on either a lattice structure or a device resembling a very large crane clearing the road by 5.7 metres.

It is beyond the scope of this study to develop a design for such a device. However we would caution that the cost of any elaborate arrangement is likely to be very high indeed, possibly over £10 million. The slipway solution could be the cheapest option of all but has not been priced.

The chances of a lift turning into a tourist attraction in its own right is quite high, particularly as there are only two boat lifts in the UK, The Falkirk Wheel and the Anderton Boat Lift. Overall visitor numbers to these attractions are quite low compared to the cost of development/restoration however. In 2011 The Falkirk Wheel received 413,004 visitors ([www.alva.org.uk/details.cfm?p=597](http://www.alva.org.uk/details.cfm?p=597)) while in 2010 the Anderton Boat Lift received 116,922 visitors (<http://www.alva.org.uk/details.cfm?p=596>). The Falkirk wheel cost £17.5 million to build (<http://www.thefalkirkwheel.co.uk/about-the-wheel-/quick-quirky-facts>), the Anderton boat lift cost around £7 million to restore (restoration was completed in 2002 <http://canalrivertrust.org.uk/Anderton-boat-lift>). It is worth noting that the attempt to restore the Foxton Incline Plane has been shelved as the trust believes it is unlikely to be able to raise the £11 million needed to complete the project nor achieve the £30,000 per annum required to maintain the site (<http://www.leicestermercury.co.uk/Foxton-Inclined-Plane-Trust-drops-boat-lift/story-20483448-detail/story.html>).

### *Conclusion*

For the scheme costs at this stage we have assumed a swing or lift bridge: if the effect on traffic flow is accepted this is the scheme with the least intrusive impact and probably the lower cost subject to service diversions not being unacceptably expensive – the extra cost of a swing or lift bridge being more than offset by the costs of avoiding the need for it.

### **Bradley Lane to Bradley Top Lock**

Assuming a solution that does not change the level of the canal at Bradley Lane (i.e. either there is no change in level or such a change is local to the crossing only) reinstatement to Bradley Top Lock is relatively straightforward. The line of the canal is not apparent and there are no remains but the area is generally level and a footpath follows the former route. Excavating a new channel across this area would be relatively straightforward. For costing purposes we have assumed a standard detail of a trapezoidal section providing 1.5 metres of water depth at the centre, 1 in 2 slopes to either side and a width at water level of 10 metres. On the towpath side a hard edge would be provided to allow boats to approach the

bank, on the non-towpath side the sloping edge would form a margin where habitat development would be encouraged.

At least one accommodation bridge would be required to connect the land either side of the new channel. Given that the area is used for grazing and vehicles have legitimate access the bridge(s) should be accessible to animals and vehicles (maximum weight 7.5 tonnes). A simple lift bridge would suffice for this.

At Bradley Junction the opportunity exists to recreate the historic scene with a T junction of canals and a bridge over the top of the Bradley Locks flight. The third arm, towards Wednesbury Oak, is not needed for the through route and cannot be restored back to the main line at Bloomfields Junction but a short length could be reinstated to create moorings. In theory the whole of the original loop back towards Bradley Lane could be reinstated as the route is clear of obstructions, but only the reinstatement of the Rotton Brunt Line is considered here.

### **Bradley Top Lock to Great Bridge Road**

Again, this length of canal has been infilled and no visible evidence of it survives above the surface except for a series of slopes in the landscape where each of the old locks were. Anecdotal and limited photographic evidence suggests the canal was simply filled in and the old lock chambers survive intact: it is likely the towpath wall is also simply buried. These factors mean much of the reinstatement here will again simply be the need to re-excavate the canal and dispose of the arisings. It is expected that the locks would be reasonably well preserved and only small scale repairs would be needed, presenting a good opportunity to utilise volunteers. Clearly new gates and furniture would be required.



**Figure 10: site of upper locks**

The channel between and around the locks should be excavated to the historic limits as far as possible, including the lagoons beside each lock: there are two reasons why these lagoons

should be reinstated: the bywash for each lock was at the end of each lagoon, and was little more than a cascade weir between the two levels – if the lagoon is not reinstated a bywash will be needed anyway and the lagoon/bywash arrangement is the most authentic from a heritage perspective. Secondly, the lagoons will be comparatively undisturbed by boat movements and will provide wildlife opportunities.

There will be a need for at least one pedestrian crossing of the canal as a public footpath runs down the canal corridor and has links to the housing development on either side. Historically there were no crossing points other than the lock gates as the surrounding housing has grown up since the canal closed. It may be appropriate for a footpath to run down each side of the canal (there is no requirement for a waterside footpath to be accompanied by a hard edge so one side can be maintained as a soft margin)

The seventh lock is immediately above Great Bridge Street Bridge: this is also buried although the copings are visible. The bridge itself has had the crown of the arch removed, information received from Laurence Hogg indicates that this was done before the canal was abandoned and a flat deck was constricted whilst the canal was still open: this is likely to still be in place. We have assumed the original structure can be re-used.

#### **Great Bridge Road to Moorcroft Junction**

This length is not infilled but is overgrown, being largely dry between Great Bridge Road and the bottom lock. The two locks were restored using HLF monies but have recently been infilled to preserve them. This length will need clearance of the dry sections (including accumulated silt and debris – it is safe to assume the canal was not dredged or cleared before being drained) and dredging below the lock. The two locks are assumed to need minor repairs and new gates and furniture – in principle very similar to the locks above.



**Figure 11: Lock 8**



### **Waterproof lining**

It is assumed that the entire canal, except for the in-water section below the 9<sup>th</sup> lock, will need a new lining. Whilst it is unlikely the original lining was dug out at the time of infilling the canal line remains remarkable dry at all times and thus rain falling on the land surface is capable of soaking away. It is possible to repair puddle clay but the condition of the clay would need to be ascertained first. We have costed the restoration on the basis of using bentonite lining throughout.

### **Excavations arising**

It is normal for canals being built at ground level (as most of this route is) to avoid the need for excavations to be removed from site by putting them on the side of the excavated channel – the resultant canal is then slightly above ground level. However, in this instance the canal has been infilled with imported fill and the levels are largely pre-determined and this approach is not readily available, the resultant banks would be approximately 0.3-0.5 metres higher than is desirable.

The overall volume of excavations arising will be of the order of 19,000 cubic metres (see costs section). It should be noted that this a basic requirement and any need to lower the canal between Bradley Lane and the top lock **adds** to this total. Ideally this should be disposed of on site or in the general vicinity by profiling the land form. However we have assumed this fill will have to be removed from site to landfill. It must be noted that if the arisings turn out to be heavily contaminated the cost of disposal will rise dramatically. However funding for decontamination may be available.

### **Locks**

It is assumed that all 9 locks are in reasonable condition and will need minor repairs when excavated: that is clearance, repointing, some replacement of bricks or masonry etc. We do not expect lock walls to have moved excessively and it is assumed that culverts etc. are intact. Experience of canal restoration suggests that copings may need replacing and that most damage to brickwork is likely to be around the waterline. Minor works in this area could provide opportunities to utilise the skills volunteers, and thus help reduce cost.

With regards to the condition of these chambers several factors count in their favour – they were built very late in canal terms – very few new locks were built as late as 1840 and thus they are comparatively young. These chambers were in use until the 1950's – infrequently but nevertheless they must have been useable then, and they have been infilled for most of the sixty years or so since their last use, which will have resisted deterioration of the brickwork and movement of the walls.

### **Bridges**

One entirely new bridge is needed for highway purposes: at Bradley Lane. It is assumed this will be a 40 tonne capacity swing bridge at present but other options are available as described in this report

It is probable that the original structure survives under Great Bridge Road but would need excavation and refurbishment.

At least two accommodation crossings will be required – one between Bradley Lane and the locks and one within the locks. It is recommended that the crossings above the locks should be lightweight lift bridges for reasons of cost. Within the locks this isn't really practical and a bridge over the tail of a lock is recommended.

Historically there was a bridge over the junction of the locks branch with the Rotton Brunt Line. This would have been one of the characteristic “Horsley Ironworks” Bridges. Ideally a replacement would be incorporated as part of a heritage restoration

### **Towpath**

We have assumed the creation of a one metre wide surfaced path following the canal throughout.

### **Water Supply**

The Wolverhampton Level (473 feet above sea level) of the Birmingham Canal Navigations is fed with water from Chasewater Reservoir, from Titford Pools via Oldbury Locks on the Titford Canal, and by pumps at Bradley Maintenance Yard from underground workings.

The Wolverhampton Level consists of 67 kilometres (41 miles) of canal and is one of the longest single levels of canal in the UK; it is by far and away the longest length at such a height above sea level. This level will form the direct feed to fill the canal at Bradley Locks and provide water for the locks to operate.

By contrast, the new length of canal is a total of approximately 1700 metres long including the lock chambers (the length of canal below the bottom lock is not included in this as it is already fed from the Walsall level). This represents 2.3% of the length of the Wolverhampton Level, either at that level or to be supplied from it.

Currently the following lock flights drain from the Wolverhampton Level

- Rushall (9 locks – 64 feet, fall to Walsall Level)
- Walsall (8 locks – 64 feet, fall to Walsall Level)
- Wolverhampton (21 locks, fall to Staffordshire and Worcestershire Canal)
- Tipton Factory (3 locks – 20 feet, fall to Birmingham Level)
- Parkhead (3 locks – 20 feet, fall to Birmingham Level)
- Brades (3 locks – 20 feet, fall to Birmingham Level)
- Spon Lane (3 locks – 20 feet, fall to Birmingham Level)
- Smethwick (3 locks – 20 feet, fall to Birmingham Level)

In addition Ryders Green Locks connect the Birmingham Level to the Walsall Level, and Farmers Bridge Locks in central Birmingham provide another route out of the BCN as an alternative to the Walsall Canal.

The implication of the above is that a number of trips through the restored Bradley Locks are likely to be using the locks as an alternative to another route off the Wolverhampton Level.

When the Bradley route is constructed, it will need an initial fill: this is estimated very approximately at 22,500 cubic metres of water. Given the length of the Wolverhampton

Level, to fill the Bradley route from this level without replenishment would lower the Wolverhampton Level by approximately 0.3 metres. We are not proposing that this happen, but the figure illustrates how small the volume of water required is compared to the capacity of the system.

Similarly, if a summer rate of 25mm loss through evaporation and leakage per day is assumed across the Wolverhampton Level then currently 16750 cubic metres are lost each day. The top lock of the Bradley Branch would consume around 120 cubic metres of water on each filling.

These figures, whilst not totally scientific, serve to demonstrate that the restored canal would create a very small increase in demand for water in relation to the existing demand and the capacity of the system. The locks would, however, provide a very direct means of water transfer from the Wolverhampton Level to the Walsall Level, in close proximity to the pumped supply at Bradley. There may be operational advantages to this.

The proximity of the Bradley supply to the new route does create a slight operational complication however. Whilst canals appear level they have a very slight gradient which falls away from the point of supply. Over short distances the gradient is scarcely relevant, but over a long distance the level might vary by as much as 75-100mm dependent upon distance, channel constraints and flow of the feed.

The furthest lock from Bradley Workshops, where the pumped supply is, is Rushall top lock, some 40 kilometres away along the Wolverhampton Level. By contrast Bradley top lock will be less than a kilometre away and as a result, if the spillweir height at each location were the same, water pumped at Bradley Yard would run weir at Bradley Locks and never reach Rushall. Detailed spillweir arrangements need to be considered but given the distance between Bradley Lane and the top lock it is likely that there is no need for an ordinary spillweir at all, just a storm overflow with a crest say 150mm higher than the normal water level.

There would still then be a requirement for a supply down the locks at Bradley, which should be subject of more detailed study. The most straightforward arrangement is to have a sluice that allows a small flow down the locks but that can be closed if required. The flow should only be adequate to compensate for expected losses through leakage and evaporation, an event such as a drained pound would require intervention.

### **Summary**

With the exception of Bradley Lane there are no significant obstacles to restoration of the route, and whilst water demand has not been studied in detail the volume required for first fill and the additional demand created by the locks is unlikely to be significant given the scale of the Wolverhampton Level as a whole and the number of lock flights already supplied.

We have at this stage favoured the most straight forward solution at Bradley Lane, a swing (or lift) bridge. The other solutions whilst technically practical would have a much higher

capital cost as a proportion to the scheme as a whole, options such as a boat lift are likely to dwarf all other costs.

## Costs

### Bradley Yard – end of Navigation to Bradley Top Lock

No	Works	Cost
1	40 tonne Swing Bridge at Bradley Lane and associated works including M+E and control panel for user operation *based on recent contract costs elsewhere-service diversion could at least double this	£300,000*
2	Creation of 700m of canal channel through level ground, works include:  Removal of approx. 10,000 cubic metres of inert fill @ £20 per cubic metre Disposal of inert fill @ £10 cm Lining of channel @£300 per linear metre	£200,000 £100,000 £210,000
3	Towpath surfacing 700 metres @£10 a linear metre	£7,000
4	2.no pedestrian bridges over canal @£100,000 each	£200,000
	Total	£1,017,000
	Prelims@ 25%	£254,250
	Design Fees @10%	£101,700
	Professional Fees @12%	£122,040
	Contingency @10%	£101,700
	TOTAL	£1,796,690

### Bradley Top Lock to Great Bridge Street

No	Works	Cost
1	7 no. Locks to excavate and refurbish including furniture e @£300,000 each	£2,100,000
2	Creation of 620m of canal channel through level ground (830m less 7 locks at 30m per lock) Removal of approx. 9,000 cubic metres of inert fill @ £20 per cubic metre Disposal @ £10 per cubic metre Lining of channel @£300 per linear metre	£180,000 £90,000 £186,000
3	Towpath surfacing 830 metres @£10 a linear metre	£8,300
4	2.no pedestrian bridges over canal @£100,000 each	£200,000
	Total	£2,764,300

No	Works	Cost
	Prelims@ 25%	£691,075
	Design Fees @10%	£276,430
	Professional Fees @12%	£331,716
	Contingency @10%	£276,430
	<b>TOTAL</b>	<b>£4,008,325</b>

#### Great Bridge Street to Moorcroft Junction

No	Works	Cost
1	2 no. Locks to excavate and refurbish including furniture @£300,000 each	£600,000
2	Clearance and dredging of 690m of canal channel (750m less 2 locks at 30m per lock) Assume 5 square metres cross section along canal length (3,450 cubic metres)	£51,750
	Assume disposal of 75% at uncontaminated rate @ £10 cubic metre	£172,500
	Assume disposal of 25% at contaminated rate @£200 cubic metre	
	<b>Total</b>	<b>£824,250</b>
	Prelims@ 25%	£206,063
	Design Fees @10%	£82,425
	Professional Fees @12%	£98,910
	Contingency @10%	£82,425
	<b>TOTAL</b>	<b>£1,293,353</b>

## 5. Benefits

Canals are an important part of the cultural and built heritage in England and Wales, for national and local identity, and creating pride for local people. They can contribute to many national and local Government policy agendas that are aimed at creating more sustainable places and communities. Canal restoration can help facilitate a wide variety of benefits to their local areas including:

- place-making, place-shaping and becoming a catalyst for urban renaissance
- facilitating housing growth and renewal
- stimulating the visitor economy, sustainable tourism and recreation
- providing options for sustainable transport
- Improving health and well-being and mitigating the impact of climate change through carbon reduction, drainage and flood management and improving biodiversity and environmental sustainability.

Restoration can offer that can offer opportunities to improve social cohesion by providing a focal point for community activity, and providing opportunities for volunteering and skills training. Investment in canals can have a wide variety of benefits beyond their immediate surroundings by feeding supply chains in the marine economy, helping to change perceptions and improve the image of an area. Such benefits can be very hard to specify in financial terms but there is a growing bed of evidence to make the case for canal restoration and improvement, some of which is evidenced below.

*The inland waterways of England and Wales are national, regional and local cultural and natural assets. They link urban and rural communities, as well as linking historic buildings and structures with the wider landscape and forming key strategic wildlife corridors. Inland waterways are helping to stimulate regional, sub-regional and local economies and are being used successfully as tools in improving community wellbeing and urban and rural housing offers; in attracting and generating investment; in place-making and place-shaping; and in delivering wider public benefit. Inland waterways are making an increasingly important contribution to the visitor economy, and there is a growing national awareness of the added value and commercial betterment deriving from the presence of waterways in developments.*

Source - *The Town and country Planning Association, 2009, Pp1. Advice note Inland Waterways.*

The Diverse Benefits of Inland Waterways (Adapted from the TCPA advice note on Inland Waterways, 2009 (below):

<p><b>Environmental sustainability &amp; climate change mitigation</b></p> <ul style="list-style-type: none"> <li>• Canals form part of the land drainage and water supply system, assisting in the mitigation of flood risk and ensuring sustainable drainage.</li> <li>• They contribute to urban cooling and form part of the strategic green infrastructure network which acts as a 'green lung' in urban areas.</li> <li>• They can provide a sustainable energy source through hydro-power and can be incorporated into SUDS.</li> </ul>	<p><b>Heritage &amp; Cultural Assets</b></p> <ul style="list-style-type: none"> <li>• Canal infrastructure forms an important part of our built and cultural heritage which contributes to our local and national identity.</li> <li>• In 2009 BWs historic estate (Britain's 3rd largest) included 4 WHSs, 51 scheduled monuments, 14 historic battlefields, and 33 historic parks, along with thousands of listed buildings/ archaeological sites.</li> </ul>	<p><b>Ecology &amp; Biodiversity</b></p> <ul style="list-style-type: none"> <li>• Canals provide valuable habitats acting as wetland and green corridors for a wide variety of species.</li> <li>• In 2009 BW's estate included 1,000 wildlife conservation sites, 600 miles of hedgerow, and 64 SSSIs</li> </ul>	<p><b>Transport</b></p> <ul style="list-style-type: none"> <li>• Canals provide an economical, low carbon, means of transporting non-perishable heavy freight.</li> <li>• The towpath network supplies traffic-free routes to walk and cycle to and from school, work or home.</li> <li>• For every kilometer of towpath restored or upgraded a saving of 100 tonnes of CO2 is generated.</li> </ul>
<p><b>Recreation, Tourism &amp; the Visitor Economy</b></p> <ul style="list-style-type: none"> <li>• As tourist attractions in their own right canals can also provide an enjoyable and pleasant means of connecting other attractions.</li> <li>• Many SMEs, jobs in craft manufacturing and the service sectors are dependent upon waterway infrastructure due to associated supply chains.</li> </ul>	<p><b>Physical Regeneration</b></p> <ul style="list-style-type: none"> <li>• Waterways are being used as vehicles in place-making, place-shaping &amp; urban renaissance.</li> <li>• They are supporting housing renewal and growth as well as helping facilitate diversification.</li> <li>• Canal restoration can help create confidence for investors and subsequently help to stimulate the market and development activity</li> <li>• Development values lift by approximately 19% for properties with water frontage.</li> <li>• research by CRT and the IWA suggest anecdotally property values were boosted 15-25% by waterway restoration.</li> </ul>	<p><b>Community Assets</b></p> <ul style="list-style-type: none"> <li>• Canal restoration can help instil a sense of local pride and improve local confidence.</li> <li>• It provides opportunities for volunteering and skills training as well as facilitating outdoor education.</li> <li>• By improving access to green space canal restoration encourages people to be more active and helps them realise the associated health and well-being benefits.</li> </ul>	

### Economic Benefits

Research by The Canal and River Trust and the Inland Waterways Association has shown that canal restoration can bring both short term and long term economic benefits including direct job creation,

during construction and after completion in marinas, boat yards, cafés, pubs and tourist attractions. Canals can contribute to local economies by attracting tourists who spend locally, supporting the marine sector, particularly SME’s and craft trades, and improving the image of an area and subsequently land and property values. Restored waterways can be valuable tools in place making and re-branding of areas to attract investment and enable transformational change, for example the Mail Box and surrounding waterside buildings in Birmingham were originally purchased by developers for £4 million, following redevelopment the site was valued at £125 million in 2003. Anecdotally it was suggested waterway restoration can increase property values by 15-25%.

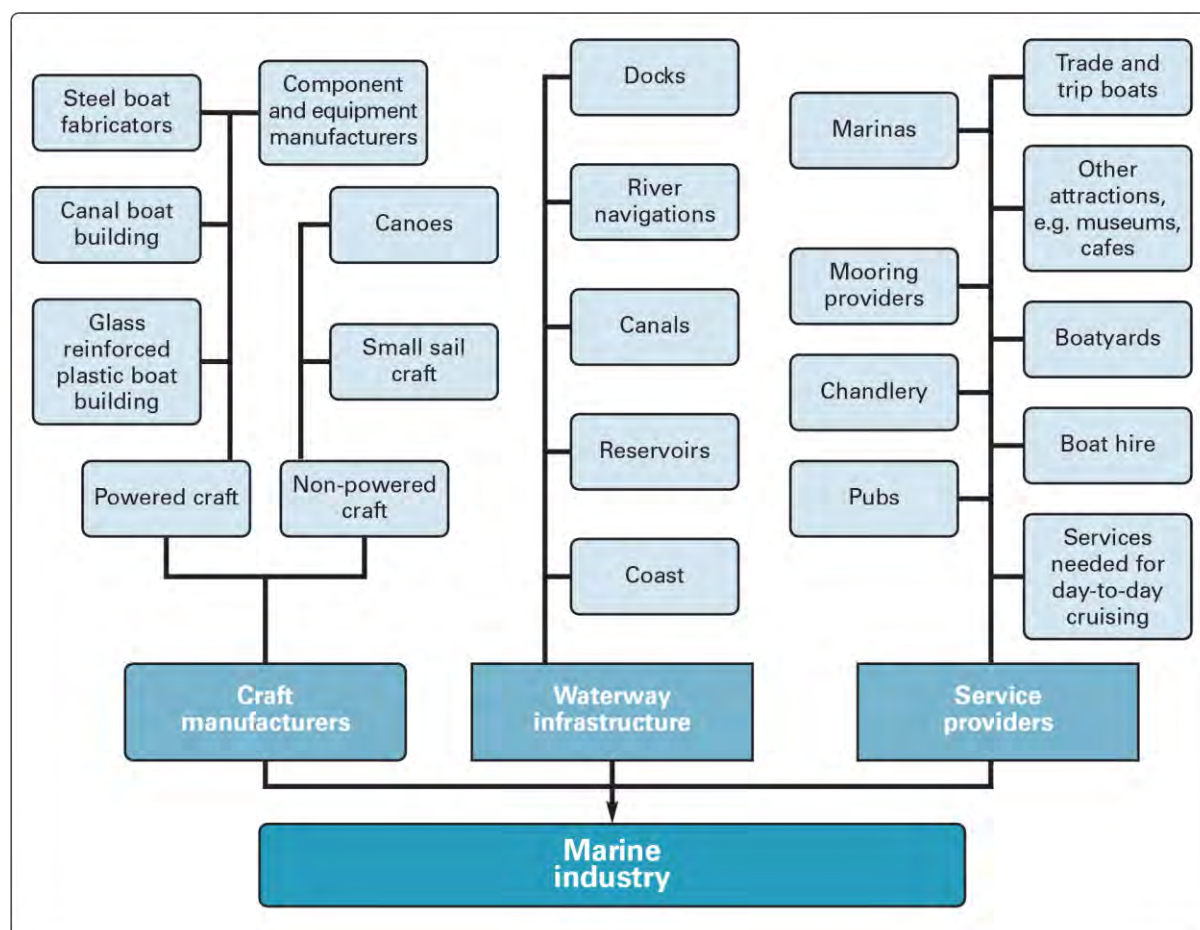


Figure 12

It can be extremely difficult to quantify the economic benefits of canal restoration due to the complexities of supply chains (as indicated by Figure 12), variable impacts upon land values as a result of image improvements and the wide ranging manifestations relating to impact upon the visitor economy. Further to this there are a wide range of incremental values that are hard to quantify in monetary terms, such as improved community health and wellbeing, leading to reductions in the cost to the NHS and local authorities. Below are a number of case studies from research undertaken by the University of Northampton for the Canal and River Trust in 2013, demonstrating the likely economic value of some canal restoration schemes around the UK:

1. **Forth & Clyde** – 12,800 Full Time Equivalent (FTE) jobs with 3500 FTE in construction. Encouraging business start-ups. Property developments, mainly residential. Attractions such as Falkirk Wheel attracting spend of over £3 million into the local economy (2013).



2. **Liverpool Canal Link** – Contributed to the delivery of an estimated 280,000 extra visitors annually to the Liverpool waterfront which in turn contributed to and £4.3 million additional gross visitor spend. 10 out of 16 leisure related businesses in the Pier Head / South Docks area reported an improved economic performance following the completion of the Canal Link project.
3. **Kennet & Avon** – Delivered 23 property related schemes, including marinas, retail, offices and residential, resulting in over £35 million of investment & 328 net FTE jobs. The restoration contributed to the success of the £250 million Oracle Centre, which attracted over 20 million visitors in first year of opening and employs more than 4000 people.
4. **Bridgwater & Taunton** – Created 51 jobs within recreation and leisure, and tourism with an estimated property value enhancement of £54 million. Over 600,000 visits were made to the canal in 2010 and these visits generated approximately £1.7 million of direct expenditure. Restoration positively supported business start-ups and business development and canal related investments often acted as a catalyst for investment and regeneration.
5. **Rochdale & Huddersfield Narrow Canals** – Created 150–160 Full Time Equivalent jobs in leisure and tourism. Delivered significant canal related development, including residential, business and offices on the Rochdale Canal. Visitor numbers for the Rochdale are estimated at 3.8 million visitors with a net impact of £2.5–4.1 million PA. For the Huddersfield Narrow estimates are 2.3 million visitors, with a net impact £2.5–2.8 million PA. The chair of the Huddersfield Canal Society suggested restoration has been the catalyst for redevelopment and regeneration in the canal corridor, which had seen an investment of over £85 million across two Local Authorities, creating over 300 jobs.
6. **Droitwich Barge Canal** (unpublished) – Has delivered an approximate 20% uplift in towpath visitors, a positive impact on businesses close to the canal, £1.1 million visitor spend from boating supporting currently 11 full time jobs. With approximately £2 million private investment in the new marina, creating 2 jobs with plans to expand and supporting significant waterside development.

*Source: Water Adds value, highlighting the Impact of the Restoration of Our Waterways, Canal & River Trust / Inland Waterways Association, 2013.*

### **Tourism Benefits (and how to optimise them)**

**The Black Country Strategic Economic Plan 2014** notes that investment in the cultural economy and the visitor economy is important both as a driver of growth and to enhance the attractiveness of the Black Country as place in which to live, work, invest and visit. This ‘enabling’ sector plays a vital role in improving the attractiveness of the area and providing a flexible range of employment opportunities as well as facilitating the development of local supply chains.

Inland waterways contribute to the visitor economy because, as well as being important tourism visitor destinations in their own right, they provide key links to markets, other visitor destinations and attractions, and are essential infrastructure upon which a wide range of leisure businesses depend. A report by the TCPA in 2009 suggested that the waterway network owned and managed by British Waterways contributed £1.2 billion per annum to the visitor economy, with a potential for growth of up to £2 billion by 2012. Their role in attracting overseas visitors generated £30 million alone. There is clearly significant potential for waterways to generate spend in the Visitor Economy, but the success of this, and level of spend, can be affected by a number of factors including:

- the condition of the waterway infrastructure itself,
- its accessibility by road, water and foot,
- the availability of other services, facilities and attractions, and
- The perception and image of the waterway, its tow path and surroundings.

To maximise the benefits of restoration there needs to be complementary development taking place along the corridor and enhancements to the towpath and immediate surroundings. Wolverhampton City Council have indicated that whilst they would greatly welcome improvements to the towpath, such as provision for walkers and cyclists, as well as seating and historic interpretation, provision needs to be such that maintenance costs would be low, avoiding designs that could easily be subject to vandalism. With this in mind we would recommend the provision of a shared surface towpath with seating benches provided at reasonably regular intervals. Interpretation boards could then be evenly spaced along the branch and include child friendly activities such as symbols or images in relief, allow rubbings to be taken and offering a feature for blind or partially sighted users. This type of attraction helps encourage people to walk the length of the canal, rather than just one small part of it, and therefore gain the associated benefits: exercise, interaction with the environment and surroundings. This would help encourage longer stays in the area and therefore increase likelihood of spend locally.

To further increase pull along the Branch and attract a greater number of visitors ideally there would be an ‘attractor’ facility at each end, encouraging both locals and tourists to go from one end to the other and possibly back again. For example, there are plans in place for the development of a new Visitor Centre at Moorcroft Wood Nature Reserve, if this was complemented by improvements to the existing Lock Factory at Bradley, such as a café and museum displays, this would increase the likelihood of visitors travelling the length of the canal and locks, stopping at each end and spending money. Additional facilities such as cycle hire, boat trips and educational tours for schools could provide further income for canal maintenance as well as increased spend in the local economy.

### **Additional Incremental Benefits**

There are a wide range of potential incremental benefits that might be realised from restoration of the canal. Whilst these can be extremely difficult to quantify, they can offer highly valuable benefits to the local community including enhanced health and well-being as a result of more people undertaking physical activities, spending time outdoors and being close to nature as well as ‘trying something new’; increased local pride and self-confidence from witnessing investment in the local area and being close to a pleasant environment, and higher educational attainment as a result of local schools having nearby facilities to utilise as ‘outdoor classrooms’ and for site visits.

### **Health and Wellbeing benefits**

There is a growing set of evidence to show that access to the natural environment, including urban green spaces, improves health and wellbeing, prevents disease and helps people recover from illness. As evidenced by Natural England, experiencing nature in the outdoors can help tackle obesity, coronary heart disease and mental health problems by encouraging people to be more active and reducing levels of stress. Indeed, in 2013 the Woodland Trust estimated that the NHS could save £2.1bn a year if everyone had access to green spaces. Further to this, the role of waterways and towing paths are specifically referred to within NICE: *Public Health Guidance 8, Promoting and Creating Built or Natural Environments that Encourage and Support Physical Activity*

(January 2008) and the *Department of Health's* publication *Be Active, Be Healthy: A Plan for Getting the Nation Moving* (February 2009) for their role in encouraging people to become more active.

Given that the site is located in somewhat deprived location where there are issues of poor health, restoration of the canal could go some way to help tackle such issues which prove to be of significant cost to public services and severely inhibit the quality of life for local residents.

*The latest report on Scottish canal regeneration sets out how the network of canal towpaths, which is extensively used for different forms of active travel e.g. walking, jogging and cycling contributes almost £7 million of additional public health benefits per annum through:*

- *219,000 as the value of casualties saved from road traffic accidents*
- *reduction in absenteeism*
- *reduction in exposure to poor air quality*
- *people visit outdoors more and take more exercise*

*The report suggests that for every £1 invested in the canal towpath network there is a return of £7 of health benefits.*

Source CRT& IWA 2013.

Mental Health and Wellbeing benefits that could be seen as a result of canal restoration and the associated creation of a pleasant enhanced natural environment include reduced levels of stress, sense of calm and overall wellbeing. The Mental Health Foundation notes that 1 in 4 people will experience some kind of mental health problem in the course of the year, whilst work related stress cost to the UK economy reached a massive £6.5bn in 2012. Yet recent research from European Centre for Environment and Human Health at the University of Exeter found that Living in an urban area with green spaces has a long-lasting positive impact on people's mental well-being, much more so than many other temporary measures. As noted by the National Audit Office's Report on Enhancing Urban Green Space: "*access to green spaces improves people's quality of life, reducing stress, encouraging relaxation, and providing a sense of freedom*" all of which are vital of overall wellbeing. What's more, access to high quality green spaces can produce measurable improvements to stress levels in a relatively short space of time (Journal of Mental Health, 2006). Restoration of the canal provides an opportunity to greatly enhance the quality of this existing urban green space by providing new landscaping, water frontage and additional planting, all of which will help encourage more people to use the area and hopefully benefit from the associated improvements in wellbeing.

Cycling is a cheap, environmentally friendly form of transport and one of the fastest growing sports in Britain as revealed by Sport England's active people Survey 2012. A 2014 study commissioned by British Cycling undertaken by Cambridge University centre for Diet and Activity Research (CEDAR) suggested that relatively minor behaviour change can bring enormous health dividends, if motorists swapped the car for just 5 minutes of cycling per day the NHS could save £250m per year as a result of reductions in heart disease, diabetes and obesity however, many are discouraged by safety issues associated with cycling on roads or the initial expense of purchasing a bike in order to 'have a go' to see if they take to it. A dedicated cycle route with associated cycle hire facilities would help

overcome some of these barriers and likely encourage more local people and visit to participate in cycling this reaping the associated health benefits.

Walking is the cheapest, easiest and most accessible forms of exercise available. Having a pleasant local environment in which to go for a walk can greatly improve the level of activity participation locally. The route of the Bradley Canal is already used by local dog walkers, however, restoration of the canal would provide an active waterfront with an attractive set of locks, improved landscaping and environmental amenity, increased presence of nature and additional features including seating and interpretation boards – all of which would help encourage far greater use of the towpath by locals and visitors, leading to significant community benefits.

### **Educational Benefits**

There are a number of educational benefits that could be realised by canal restoration including direct access to local heritage, biodiversity and the environment supporting subjects such as geography, history and biology. Schools, particularly in urban areas, have long used parks and green spaces to access the natural environment as a means of education. They provide free ‘outdoor classrooms’ that are highly conducive to learning and help children and young adults relate and connect to their local environment, something which can help combat the lack of understanding that feeds into a spiral of local and global environmental degradation.

Many teachers believe field trips and site visits are vital educational assets, they are *“often the most memorable learning experiences, help us to make sense of the world around”* (teachers.org.uk) that can help raise educational achievement. Given that the Bradley Canal is in a less affluent area of the UK, it is likely that many local school and the families of their pupils may find it financially difficult to fund field trips, especially those that require transport outside the local area. The Canal and River Trust already operates an educational programme and provides learning resources linked to the National Curriculum: trails, water safety sessions, challenges and other activities. Restoration provides the opportunity to utilise this and further develop resources such as heritage trails and dipping ponds. There are five schools within very close proximity to the site, and a further five a relatively short distance away, all of which could utilise a restored canal as an active learning space, as could many other schools in the local area.

### **Community Benefits**

Waterways transect many of the most deprived districts and wards within England and Wales and consequently are increasingly being used as a means of tackling deprivation through community regeneration. Canal restoration can offer opportunities for volunteering that enable communities to come together to focus on a collective goal, whilst gaining new skills, confidence and sense of pride. *“It is important that local communities are fully engaged in the future planning of their local waterways so as to secure community ownership and use. The long-term sustainability of the waterways will be dependent upon a shared vision developed through community involvement and participation”*. TCPA / BW, Policy Advice Note: Inland Waterways, 2009.

Evidence from the Scottish Index of Multiple Deprivation (SIMD) proposes:

*That investment in canal-side communities, such as in North Glasgow, has led to a relative improvement in their SIMD\* ranking. The evidence does suggest that the activities of Scottish*

*Canals are helping to reduce deprivation in some of Scotland's most disadvantaged communities. Making communities more attractive & engaging them & fostering civic pride.*

CRT & IWA 2013

With this in mind it can be concluded that with the correct management and enthusiastic leadership restoration of the Bradley Canal could provide real opportunities for engaging the community and to enhance community spirit locally. Not only would use of volunteers reduce the overall cost of restoration it would enable people to learn new skills, gain confidence, friendships and help provide all important ownership of the canal which is a vital element of gaining support for the scheme, enhancing civic pride and preventing vandalism and anti-social behaviour.

### **Potential Use and Benefits**

At present the canal route does not exist as a waterway and is used exclusively by walkers and occasional cyclists. Restoration, aside from creating two miles (three kilometres) of new navigation, would create a through route approximately four miles (six kilometres) long between Deepfields and Moorcroft and also create a new direct corridor that incorporates the Tame Valley Canal and would be the shortest route between Salford Junction in Aston and Wolverhampton top lock: this last is significant as a number of boaters making a cruise on a route through the Black Country already go through both these points.

Boat ownership on the inland waterways is at an all-time high, new boats are built faster than old ones are scrapped, and steel narrow boats have a very long life with many examples still serviceable at well over 40 years old. The "grey market" that has fuelled much of this in the last twenty years will decline as early retirement becomes less attractive but, against that, many younger people are taking to the waterways as a way of life and despite bad press the vast majority of liveaboards wish to either have a proper, serviced mooring or travel significant distances on a regular basis.

It appears there are very few permanent moorings on canals in this part of the Black Country – notable ones near Bradley Locks being at Ocker Hill where CRT has facilities, and a few private moorings near Wolverhampton. Whilst this may reflect the character of this area as being one to pass through rather a desirable base for boating, the situation across the whole of the BCN is little altered for many years save for mooring areas promoted by BW/CRT such as those at Ocker Hill already mentioned, and places such as Hockley Port and the Engine Arm: these have been developed for a mix of leisure and residential moorings.

It should also be noted that the existing provision is for fairly small scale moorings with little, if any, scope for expansion on the same site. The existing CRT provision, and other examples such as Longwood Boat Club, are based around otherwise disused branches off the through routes. Each of the locations listed are secure and have facilities such as showers, laundry and post rooms. The creation of a route through Bradley would provide opportunities for further such moorings either on line or by adding a basin to one side, perhaps by restoring a short extra section of the Rotton Brunt Line for example.

Nationally moorings have been in short supply and there is still a distinct shortage of residential moorings. For reasons stated mooring demand has perhaps been stifled in the Black Country but the success of locations such as the CRT run sites suggests demand exists for suitable developments.

Overall there is probably demand for at least 50 and up to 200 moorings in the area, which could be provided at either a single site or in several smaller sites. Mooring fees are typically £2,000-£3,000 per annum.

### *Bankside users*

Canals in urban areas have increasingly become recreational corridors for walkers, cyclists and anglers. Generally traffic free, the watercourse also encourages a level of flora and fauna not readily found in an urban area, making an attractive environment for a range of activities.

The above could take place simply by reopening the canal corridor, but an active canal will prove more of an attraction. In the first instance creating a walking and cycling route may be the objective with restoration following alongside.

### *Potential economic benefits from visitors*

Research elsewhere indicates visitor numbers of the order of 100,000 per mile on popular canals, one third of these visitors spend an average of £10 per visit that would not otherwise have been spent in the local economy. These figures include popular locations such as Bath and Oxford as well as major regeneration sites and rural lengths of canal. The popularity of other lengths of canal of urban canal in particular around London and the West Midlands suggests that significant visitor numbers might be achieved.

We have not assumed that any day hire boats or holiday hire boats would be based on the canal. However, with 1,100 (estimate) boat movements each year recorded past Deepfields Junction, we have assumed a conservative 200 boats diverting to use the branch and make an overnight visit given a destination for this.

The following economic benefits (excluding land values) are therefore suggested

Visitor Type	Category	Expenditure/unit	Units	Total
Moored boats	Running costs (excluding mooring fees/licence)	£1,110	100	£111,000
	Mooring fees per annum	£831*	100	£831,000
	Spend whilst aboard per visit	£25	100/20 visits per boat	£50,000
Visiting boats	Hire/day	£67	100 days	£6,700
	Private/day	£24	100 days	£2,400
Angling	Spend per visit	£8	Included in informal visitors**	
Cycling	Spend per visit	£9	Included in informal visitors**	
Informal visitors	Spend per visitors	£6	50,000**	£300,000
			<b>Total</b>	<b>£1,301,100</b>

\* This average included end of garden moorings and on line moorings: in the context of new, secure urban moorings with facilities it is likely to be low and a higher spend can be expected

*\*mooring spend also assumes no residential users – residential boaters also spend their domestic budget in the local area*

*\*\* This results in the lowest figure for bankside users being used for all visitors, the resultant figure will be higher. We have assumed some uplift in benefits along the existing very lightly used Wednesbury Oak Loop.*

The above figures have to be taken in the context of restoring the canal in its current surroundings. We have not, at this stage, attempted to quantify any large scale regeneration benefits although we have identified the potential for both urban regeneration and tourism benefits. We have also alluded to the most obvious opportunity of urban redevelopment at Bradley Lane and include an illustrative scheme for this. (visualisation below with plan in appendices)



Illustration 1: Redevelopment for Bradley Lane, from the main road looking south.

## 6. Biodiversity and Habitats

The ecological and biodiversity benefits of canal restoration are often seen as secondary and therefore undervalued in comparison to the economic and social benefits of such schemes. However, for this project the ecological benefits are of significance, not least because the commissioning client, (the Canal and River Trust / West Midlands Waterway Partnership), is committed to promoting the conservation of biodiversity, and has a dedicated team of highly qualified environmental scientists and ecologists, employed to do so. In light of this, the following section does not go into great detail about specific habitats or species but identifies the importance of wildlife corridors, including canal corridors, for preserving biodiversity in the UK.

By adding water to the green wedge that already exists at the site of the in-filled Bradley Canal, significant biodiversity gains will be realised. Providing a new wetland habitat that links two existing wetland habitats will allow much greater movement of species thus reducing the risk of species isolation and ultimately extinction from that area. Furthermore it is hoped that by creating a new environment more species will be attracted to the local area.

We have received information from the Ecorecord Database: the information received is included in an annex to this report and has informed this report. The data received includes

Plans identifying designated sites adjacent to the canal route and within two kilometres of the canal route

Details of designated sites

Birmingham Canal Wolverhampton Level 2011 Local Site Assessment Report

Protected Species within 2km of Bradley Locks (XL Spreadsheet)\*

WCA Schedule 9 Species within 2km of Bradley Locks (XL Spreadsheet)\*

*\*These are provided as XL files only, and have not been converted to printable PDF format*

### Wildlife Corridors

Very simply, a wildlife corridor (often also referred to as a habitat corridor or green corridor) is an area of land used by wildlife to travel from one larger block of habitat to another. They connect wildlife populations separated by human activities or structures (such as roads and other developments), and often lie along streams, rivers, or other natural features. These corridors protect environmentally sensitive areas by providing linkages in the landscape and potential buffers between natural and/or human communities. For wildlife, a corridor may not be made entirely of prime habitat; occasionally even a wide hedgerow or vegetated stream buffer may suffice as animals travel from one place to another.

Wildlife corridors may potentially moderate some of the worst effects of habitat fragmentation, wherein urbanization can split up habitat areas, causing animals to lose both their natural habitat and the ability to move between regions to access all of the resources they need to survive. Habitat fragmentation due to human development is an ever-increasing threat to biodiversity, and habitat corridors are a possible mitigation. Wildlife corridors can also assist in re-establishing animal populations that are in danger or diminished because of human or natural events. By maintaining a



contiguous pathway from one habitat to the other, wildlife corridors provide habitat for continuous populations and allow individuals to range as far as they need. This allows an exchange of individuals between populations, which may help prevent the negative effects of inbreeding and reduced genetic diversity (via genetic drift) that often occur within isolated populations. Corridors may also help facilitate the re-establishment of populations that have been reduced or eliminated locally due to random events (such as fires or disease).

Wildlife corridors also help keep wild animals out of urban areas, allowing for the safe coexistence of animals and humans. Allowing people and animals to go about their lives around each other keeps the space sacred for both parties. These corridors also give scientists the chance to research migratory patterns and potentially better ways to treat the wild animals in urban centres.

There are two main types of wildlife corridors, although many different kinds of ways in which these

corridors can be built. There are continuous corridors, which are large, unbroken strips of green corridor that lead to another habitat, and stepping stone corridors, which are small patches of habitat that are connected by smaller green corridors. Migration can therefore be conducted despite the kinds of human activity in the area.

Such are the importance of wildlife corridors that they now feature significantly in the UK Biodiversity Action Plan, the 'UK Post-2010 Biodiversity Framework' (July 2012) and local Biodiversity Action Plans around the country. Indeed, local to the Bradley site there is clear evidence that wildlife corridors are of highly important value for the Black Country environment as outlined in the text box below.

#### **The value of canals as wildlife corridors**

Canals, though built for industrial and agricultural freight, are now waterway channels that provide some of our most obvious wildlife habitat. Despite their artificial origins, 200 years later many are designated as important Wildlife Sites at local, national and international level. As noted by British Waterways (now Canal and River Trust) "*Their slow flows and*

#### **Walsall MBC's website explains the importance of 'green corridors' locally (in summary):**

Often overlooked as simply waste ground between residential areas, Goscote Valley is a vital wildlife link to the wider countryside. Because it is a place of vital connectivity for wildlife, it is often the residents of Goscote who experience close encounters with our most elusive and secretive wild creatures including deer, foxes and bats as well as birds, amphibians and reptiles. In particular, insects rely on these networks to move about safely, find food and mate. It is often an industrial past which has led to some of today's best green corridors - Canals and old Railway Lines become wildlife highways when they cease to be used for industry!



Heath End is an urban nature reserve. The 12 hectare site is a fantastic mosaic of different habitats, including blocks of woodland, scrub, grassland, wetland and open water. Because it is adjacent to the Wyrley and Essington canal, it is a wildlife corridor for water fowl, and is a rich habitat in which amphibians flourish. The site is best accessed off Slackey Lane or Brewer's Drive.

*managed water levels provide a unique environment that has become internationally important for nature conservation". P.5 (British Waterways and Biodiversity – A framework for waterway wildlife strategies).*

Canals provide a green corridor into urban areas which offer a mixture of freshwater and terrestrial habitats. Because they are often less intensively managed than the surrounding land, canal and canal side environments can be very important for wildlife offering a variety of habitats that suit a range of species.

Canals form important wildlife corridors through developed and agricultural landscapes. They enable species to bridge geographical barriers that exist between river systems. As artificial habitats, canals differ from rivers in providing a very slow moving water body with a more regular linear profile, gently curving bed, uniformity of substrate and a relative constancy of water levels. Consequently, unlike other flowing aquatic systems, canals provide a relatively stable environment for the biota that they support. This stability, as well as habitat longevity and often consistent management has enabled many canals to support a diverse range of habitats and species.

The canal habitat itself is often a last foothold for many species whose natural wetland and aquatic habitats have diminished or disappeared. Additional habitats within the canal corridor such as banks, off-line sidewaters, and surrounding grassland, heathland, hedgerows or wooded areas provide shelter, breeding and feeding sites, for a range of species that utilise canals.

Waterway banks are some of the UK's most biodiverse habitats. Developing since the waterways were built, banks became colonised from adjacent ponds and wetlands, most of which have now vanished. Consequently, the remaining canal banks are now particularly valuable for biodiversity.

Most of our water birds use waterway banks for nesting. Coots and moorhens hide their small nests

#### **Towpath verges support many meadow plants**

Close to the waterway bank wet meadow plants can often be found, such as gypsywort, bedstraws and skullcap. On the hedgerow side of the towpath dry meadow plants such as cow parsley, red campion or oxeye daisy can be found. At the edge of the trodden path there are more trample-resistant plants such as plantains and dandelion.

Grassland and flowers at Bradley Canal site



in bankside vegetation. Larger birds such as mute swans build large nests in the open, usually on the offside bank to avoid disturbance, but also on towpath banks with good habitat.

Waterway banks are home to water voles and many amphibians and reptiles, including frogs, toads, newts, grass-snakes and aquatic insects. These species are usually hidden from view in the taller vegetation of the banks. This vegetation provides them with essential food, cover and habitat for breeding. This in turn creates great hunting grounds for kingfishers and otters, two top predators of the waterways.

A huge range of invertebrates also live in the canal side habitat. The Succinea snail is

common in tall grassy areas, whilst rarer snails, such as the Desmoulin's snail which lives in this habitat on the Kennet & Avon Canal, can also occur. Banks are also very rich in insects - dragonflies, damselflies and other species with aquatic larvae spend their adult lives feeding and breeding here.

Habitat quality varies, both along the waterway and from bank to bank, it often differs on the offside bank, where 'poaching' by cattle can create wide shallow conditions.

Towpath verges often extend many miles along waterways and can support a very rich flora and fauna. Their wildlife value has gradually developed over a period while meadows and field margins in the wider countryside have lost many species as a result of development and changing agricultural practices. Today canal towpath verges can be particularly valuable for biodiversity because even narrow verges can support a range of animals and plants; they also provide important oases for local wildlife in urban areas. Canal associated habitats are often rich in species which are relics of formerly widespread habitats such as unimproved grassland, marsh and carr. They provide habitats for species which have been displaced from their natural environment as a result of urbanisation.

Canal supply reservoirs and feeder streams are also often rich habitats that extend the influence of the corridor and provide a more hospitable environment alongside canals that can be impacted by heavy boat traffic. The extensive bankside tree resources which surround the country's canals help in the re-colonisation of the countryside by European otter, whilst canal tunnels can provide roosting, foraging and hibernation sites for bat species. If the climatic conditions within a canal tunnel are right, and suitable cracks and crevices are present, bats may use canal tunnels for breeding.

### **Wildlife Benefits of Restoration**

Waterway restoration can greatly benefit the local environment in a number of ways. A report by the Canal and River Trust & Inland Waterways Association – *Water Adds Value, 2014* – notes that restored waterways have been found to improve bio-diversity of whole areas, bringing wildlife into the heart of our communities and acting as green lungs within towns and cities. Waterway restoration has helped to create a rise in the number of some of the nation's important and much-loved species such as water voles, kingfishers and native crayfish.

Research by Northampton University: '*review of the impact of waterway restoration*' March 2014 (which is the basis of the *Water Adds Value* document) further explains the environmental benefits of canal restoration. The wealth of benefits identified by the data included improved air quality and drainage in some areas, and reduction in levels of poor air quality as a result of both commuter and freight traffic decreasing in some parts of the country.

The research also notes that many of those interviewed commented upon the significant increase in wildlife along the restored canals, and improved and increased green space. Improved biodiversity in the flora, fauna and habitats was reported as well as reductions in traffic (as people use the improved towpaths for commuting). However, it is perhaps the number of SSSIs along the Forth & Clyde and Union Canals that provide the strongest evidence of the environmental impact that canal restoration can have on an area. Indeed there are over 20 SSSIs along the Scottish Lowland canals alone.

### **Benefits at Bradley Canal Site**

The Bradley Canal site already holds some nature conservation value which is recognised by all three Local Authorities through which it runs. As identified in the Planning Policy review, the entire site is allocated as a greenway and much of it as a Site of Local Importance for Nature Conservation (SLINC) by Walsall, Sandwell and Wolverhampton. The eastern part of the site is also allocated as a Local Nature Reserve as it adjoins Moorcroft Wood Local Nature reserve. Furthermore, there are a number of wildlife designations surrounding the site including Great Bridge Road, Rocket Pool and Weddell Wynd, and an area to the west of Wednesbury Oak and South of Batas Hill is identified as a potential new nature conservation site in the Sandwell Site Allocations DPD.

However, whilst the Bradley Canal site is obviously of importance locally, on a national scale the biodiversity and ecological value of the site is limited. Discussions with the Birmingham and Black Country Wildlife Trust have confirmed that biodiversity would be improved just by the fact that an open water channel would be created which is linked other stretches of water. There are water vole populations on the mainline canal and restoration of the Bradley Canal might potentially provide an opportunity to increase their range. There are also otters on the Staffordshire & Worcestershire Canal so there may be opportunities for populations in the future. Additionally, as noted by English Nature, Moorcroft Wood LNR has recorded several species of bat on site, including the enigmatic Daubenton's bat (or water Bat) which skims the water searching for food. Offering extra feeding grounds could greatly benefit this species locally.

The Wildlife trust also explained that the Bradley Canal site is a typical Black Country landscape – kept open by ponies grazing. Too much ad-hoc woodland planting in the 1990's led to an artificial change in the landscape which often has not been well maintained and led to dead, dark spaces. The Wildlife Trust do not wish to create any more Woodland and do not feel that tree planting would benefit the area around the canal corridor. The Wildlife Trust felt that the site had developed its own intrinsic interest partly based on grazing. There is no need for huge additional planting, the ponies help keep the area open and prevent takeover of one particular species, maintaining this would be no bad thing. Grazing enables the area to get as near to a meadow as it can and keeps maintenance costs down, something which is a key concern for all three Local Authorities.

The Ecorecord data indicates that there are NO SAC's or SSSI's within 2km of the canal, and lists one Local Nature Reserve, Moorcroft Wood. This is referred to elsewhere in this report and visits to this are actively encouraged by the Birmingham and Black Country Wildlife Trust. Moorcroft Wood is adjacent to the Bradley Locks Canal on the lowest length as the route approaches the Walsall Canal.

The database also lists 40 sites of Importance for Nature Conservation (SINCS), of these one is the lowest length of the Bradley Locks canal which is currently in water but unnavigable. This will clearly be affected by restoration and an agreed conservation management plan would be essential for this length (and advisable for the whole of the restoration scheme). A second SINC is identified on the Wednesbury Oak Loop, which is the canal leading to Bradley Lane from the Birmingham Canal Main Line. This canal is not affected directly by the restoration process but any boats passing through the locks will transit this section. It is worth noting that this length which is navigable, contains more habitats of note than the unnavigable length of Bradley Locks, and also contains two of the three habitats noted at Bradley Locks (neutral grassland and scrub).

At least four other sites are included within the search area that are navigable canal and thus may see an increase in boat traffic. Whilst this should be noted traffic levels are not high at present on these routes and the increase is expected to be very small.

Sites including Weddell Wynd, Strirling Road Open Spaces and Great Bridge Road are adjacent to the canal and should be addressed in a Conservation Management Plan.



**Figure 13: grazing along the canal line**

At present proposals are to create on hard bank on the towpath side and a soft bank on the other. As noted above soft banks can hold significant biodiversity value as they create good habitats for a wide range of species. The Wildlife Trust did suggest that adding lagoons to the edge of the canal would be an added bonus but recognised this may create safety and maintenance issues. Lagoons were an original feature alongside the original Bradley Lock Flight and there is a heritage benefit to recreating these as part of the scheme.

As boat traffic on the canal would not be significantly high, it is felt that reinstating the canal at Bradley would provide significant opportunities for habitat creation and biodiversity gain. Given the proximity of surrounding sites of local importance for nature conservation, restoration of the Bradley Canal could provide a real opportunity to link these and provide a more comprehensive network for habitats for a range of species.

Prior to any planning applications being submitted or works taking place, ideally an ecological survey of the site should take place to truly establish its current conservation value and what opportunities exist for enhancing biodiversity and habitats.

## **7. Funding**

There are many funders who focus in particular themes. Where large capital sums are not forthcoming, it is useful, in terms of identifying funding, to also examine the different elements of the restoration which could be funded by different organisations. These include:

- physical engineering works to channel/locks
- highways alteration/improvement
- historic structure repair
- works to reduce flood risk
- environmental enhancements or mitigation
- community involvement
- sports/health development
- interpretation and education
- visitor facility construction

Funding will need to be assembled from a range of sources to ensure that the work can proceed. In view of the long timescale of the project there is little point in examining in great detail every single funding source. An excellent overview is given in the IWA's "Funding for Waterway Restoration" chapter of their Technical Restoration Handbook. Typical sources of funds for canal restoration projects include:

- Lottery Funds
- Inland Waterways Association
- Local Canal Society
- Canal and River Trust
- English Heritage
- Local Authority Resources
- Homes and Communities Agency
- Land Fill Tax Credit
- Private Sector
- European Structural Funds
- Sport England

Of these, European structural funds are now extremely limited for English projects, as funds are being diverted to new European countries. As there appears to be little opportunity for securing any European funding, Lottery and HCA funding targeted at regeneration and community enhancement therefore tend to be the principal larger sources of capital funding.

In addition, the 'new build' aspects of the project such as Bradley Lane crossing (while generally following the original route) may limit the scheme's eligibility for Heritage Lottery funds.

Notwithstanding the above, funding regimes through which schemes such as the Huddersfield Narrow Canal, Forth and Clyde Canals and Droitwich Canal restorations have been delivered are now closed. It is likely that the funding picture will be substantially different in two or three years (by the time the necessary pre-works have been undertaken to enable a start to be made in earnest with the restoration) and so a detailed funding proposal has not been prepared at this stage.

The remainder of this section outlines many of the current funding sources of funding available for canal restoration schemes.

## **Potential Sources of Funding**

### **Government Sources**

#### *Local Authority Resources*

It is recognised that the Local Authorities involved do not currently have the resources, or the will, available to fully fund a project of this scale. However, they may be able to part-fund certain aspects of the project and are likely to serve as the channel through which many alternative sources of funding may be secured. Local Authorities will be particularly useful where the restoration conforms with planning policy and other strategies; it is important therefore to make efforts to ensure policies favourable to the restoration or which the restoration could enhance are incorporated into emerging Local Development Frameworks (LDFs).

#### *Homes and Communities Agency*

The Homes and Communities Agency is responsible for promoting economic and social infrastructure development. There is little possibility of direct project funding from this source; however, regeneration projects that benefit the canal may be eligible for funds and where the canal makes a contribution to this coming forward the canal itself will be eligible for funding

### **Waterways-Related Sources**

#### *Inland Waterways Association*

The Inland Waterways Association (IWA) supports the restoration of derelict waterways in a number of ways from lobbying to providing volunteer labour and financial aid. The IWA provides grants to assist with projects such as hands-on restoration schemes and helping to finance feasibility studies.

Grant applications should demonstrate that the grant would apply to one of the following types of project:

- Construction – especially work relating to restoration of Navigation
- Administration – for example, part funding a project officer
- Professional services – such as funding or part funding a feasibility study
- Land Purchase
- Research on matters affecting waterway construction – including original research and literature reviews
- Education – for example, providing promotional information to local authorities or agencies
- Plant and equipment – the Trust has already received funding for a JCB excavator and a cement mixer.

An application over £2,000 should also demonstrate the extent to which it satisfies at least one of a number of conditions specified by the IWA. These conditions are:

- The grant would unlock a grant several times larger from another body.
- The grant would not replace grants available from other sources.
- The project does not qualify for grants from major funding agencies.

- The grant would enable a key project to be undertaken which would have a significant effect on the prospect of advancing the restoration and gaining funds from other sources for further restoration works.
- The result of the project would have a major influence over the progress of a number of other restoration projects.
- The Restoration Committee would have a major influence on the management of the project, including the monitoring of expenditure.

### *Local Canal Society*

In many instances waterway restoration is part funded by local canal societies, who may have funds of their own through their fundraising activities or bequests, or may be able to apply for funding that other agencies cannot. For example, The Cotswold Canals Trust has committed to raise £800,000 towards the phase 1 restoration of their canal at Stroud. The Birmingham Canal Navigations Society have a remit for the whole of the BCN and may be an appropriate body to take on such a role or it may be preferred to set up an organisation specifically for Bradley Locks. It is noted for example that the Lichfield and Hatherton Canals, and the Lapal Canal, whilst falling at least in part within the BCN, have their own societies and trusts

### *Canal and River Trust (CRT)*

Navigation authorities can be sources of match funding and expertise as well as having great influence with planning and other statutory bodies. These bodies can often access third party funds even if they have no core funding themselves to offer: Canal and River Trust are taking an active role in assisting restoration projects across England and Wales, providing support and advice and potentially acting as a channel for funding agencies.

### **Heritage Lottery Fund**

The Heritage Lottery Fund (HLF) uses money from the National Lottery to give grants to support a wide range of projects involving the local, regional and national heritage of the United Kingdom. The aim is to help groups and organisations of all sizes with projects that aim to:

- care for and protect heritage
- increase understanding and enjoyment of our heritage
- give people a better opportunity to experience heritage by improving access, and
- improve people's quality of life by benefiting the community and wider public

These aims are grouped into four strategic priorities that guide Heritage Lottery Fund Policy and underpin its decision on funding. These priorities are: Heritage Conservation, National Heritage, Local Heritage and Heritage Education and Access. It is recognised that 'heritage' covers a range of things, places and people, from photographic collections to sites linked to industrial, transport and maritime history. Currently the Heritage Lottery Grants are divided by scale and theme, with the largest grants (over £5 million) being allocated nationally. Given the excess demand for it is more likely the Heritage Lottery fund would fund small-scale works at an early stage of the restoration than part fund the restoration of the entire canal, although the comparatively small scale of the restoration would make the scheme more favourable, and also lend it to locally allocated funding rather than major grants



### **English Heritage**

English Heritage has indicated that it is only able to consider grant aid for canals in England if the canal itself lies within a designated conservation area. Grant aid may also be available for individual canal structures located outside of conservation areas if they are listed at Grade I or II\*.

### **Lottery Fund & Associated Social/Environmental Funders**

Lottery funding can cover many areas including Heritage, as above; however a principal focus is to address social issues in various guises. The lottery is often combined with other sources (e.g. Sport England or the Arts Council) to create specific funds; these change constantly. The key potential source at present is described below.

#### ***Big Lottery Fund***

The Big Lottery provides lottery funding for educational, health and environmental projects which help create lasting improvements to quality of life, particularly in disadvantaged communities. Quality of life projects that may be supported include those that improve elements of local value and projects that complement the work of the Heritage Lottery Fund. There is an increasing emphasis on health, sport, education and social inclusion, with some focus on environmental improvements. New schemes or funds are constantly being introduced; certain funds may have limited timescales or budgets, so constant monitoring is critical, to ensure that likely sources are identified

#### ***Other Lottery Sources***

Whilst lottery funding for arts and sports are never going to provide the core funding for a scheme such as a canal restoration project, funds for these activities have been provided and can add to the value of the restoration scheme thus encouraging other funders on board for the resultant community benefits. It should be noted however that grants from one lottery fund cannot be matched with grants from another lottery source.

### **Private Sector**

Opportunities for private sector funding include business sponsorship and Section 106 contributions on private sector development. Private sector development also contributes to funds through CIL and the New Homes Bonus, although these are not all that likely to be allocated to a canal restoration project. It must be stated that in the short term this is unlikely to yield significant returns, and frequent statements of recovery are yet to bear significant fruit at least as regards contributions to schemes such as this. However the scope for canal restoration, with a longer term horizon, is undiminished.

### **Benefits In Kind**

The Trust benefits from the efforts and expertise of its volunteers and from the donations made by local firms. These benefits in kind can be used as match funding for other sources. Bodies such as HLF set out specific rates at which manual and professional services can be costed towards matching funding requirements.

Other possible sources of free (or cheap) labour are open prisons, the probation services, Duke of Edinburgh Awards scheme, British Trust for Conservation Volunteers (BTCV), the Waterway Recovery Group (WRG) and the range of constantly-changing government schemes for enabling those out of work to help in the community.

## 8. SWOT Analysis of Restoration

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Supportive Planning Policy Framework</li> <li>• Supportive Land owners</li> <li>• Support from the Canal &amp; River Trust and the Wild Life Trust</li> <li>• The area is already well used by local people walking along the towpath</li> <li>• Large population living nearby could all enjoy the canal</li> <li>• The line of the canal is mostly free of development as is the towpath</li> <li>• Line of the canal is protected from future development</li> <li>• Locks are filled in and remain underneath the earth (CHECK)</li> <li>• Walsall and Birmingham canals are both navigable – restoration would provide a link between the two</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Funding pressures – the local deprivation and low income households create financial pressures upon Local Authorities</li> <li>• Water supply issues</li> <li>• Change in levels and possible need for road realignment or swing bridge</li> <li>• Requires large amount of land to be moved and disposed of</li> <li>• Site spans 3 Local Authorities creating a complex set of regulations and possible need for 3 planning applications</li> </ul>
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Wide towpath and surrounding land/green space offer opportunities range of recreation activities</li> <li>• Levels of quality urban green space is low locally – need to improve supply</li> <li>• Restoration could help address health and wellbeing issues</li> <li>• Enhanced sense of pride locally and improve aspirations</li> <li>• 5 Schools in close proximity could benefit from educational value - ecology, biology and heritage</li> <li>• Help create a unique feature locally that reflects the areas industrial past and adds to the urban form</li> <li>• Possible funding available through HLF and match funding through planning obligations / gain</li> <li>• Creation of a wildlife corridor linking to Moorcroft Wood Local Nature Reserve and 2 existing water courses</li> <li>• Tourism opportunities - both water and land based with possible links to the locks factory</li> <li>• Provision of volunteering opportunities</li> <li>• Skills training and apprenticeships during reinstatement</li> <li>• Creation of a navigable loop for boating which can generate fees</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Water Supply issues esp. given proposals to restore the Lichfield &amp; Hatherton canals</li> <li>• Road re-alignment is likely to be required due to low bridge – highly costly</li> <li>• Rigorous competition for funding within a deprived area</li> <li>• Other competing canal restoration schemes locally</li> <li>• Will not immediately create a guaranteed or high number of long-term jobs</li> <li>• Potential for competing interests of local authorities</li> <li>• Cost of groundwork</li> <li>• Vandalism and safety</li> <li>• Environmental Impacts across large network hard to assess and predict</li> </ul>

## **9. Conclusions and Recommendations**

The restoration of the Bradley Canal is proven to be practicable and will bring benefits to the surrounding area. There are no insurmountable engineering obstacles and there are solutions at reasonable cost to all of the perceived pinch points along the route. In practice, although the canal is infilled, this is one of the easier restorations being considered in England and Wales by virtue of its length and simplicity.

By and large the line is unimpeded and no demolition is required actually on the line of the canal: however, unless alternative arrangements can be found for the service area to industrial units off Bradley Lane this site will need to be redeveloped for the canal to be reinstated. An outline proposal has been made for this.

Bradley Lane Crossing (Tup Street Bridge) can not be reinstated as it was when the canal was open and a range of alternatives have been considered. We have recommended a swing or lift bridge.

Environmental issues, planning policy and funding sources have all been considered and are described in the body of the report.

It is recommended that the proposed route is adopted for the restoration, and that preliminary work such as land purchase and outline design should proceed.

### **Planning Protection**

It is further recommended that the Partnership should continue to liaise with planners and that the proposals made in this Feasibility Report should be put forward for inclusion in the Local Development Framework to ensure that the proposed alignment receives planning protection. Whilst there is much detail to address, there are no insurmountable objects to restoration within the timescales required by the Framework.

### **Further Investigations**

#### **Water Supply Study**

A water supply study should be carried out by the Canal and River Trust. This should establish whether there is sufficient excess capacity in the system on and above the Wolverhampton Level to feed the canal: our assessment is that the amount required is so small in the scheme of things that it is very likely no further provision is needed. If there is not adequate capacity then options for increasing capacity should be identified and the feasibility of each option assessed.

#### **Environmental Impact Assessment**

A screening opinion should be sought from the Local Authority to confirm the nature and scope of EIA required. A Strategic Environmental Assessment may be required due to the proposal for phased delivery of the scheme – this would have the benefit that EIA can follow on for each phase rather than being undertaken as one large task for the whole scheme, and it may be possible that smaller enabling work packages in advance of the main works in any Phase would not require EIA individually.

#### **Main Site Investigation**

A generalised geotechnical desk study and site investigation along the length of the scheme should be undertaken at an early stage. This should be designed to characterise:

- the engineering qualities and waste management classifications of the materials likely to have to be excavated
- the level of ground water and nature and competence of soil and rock strata underlying the proposed line of the canal
- the likely design slope angles for each main area of cutting or embankment along the line of the route (note, there is very little of the route in cutting or on embankment, but as the land is not perfectly flat these features will exist)
- The engineering qualities of the existing soil and rock strata in the vicinity of any proposed structures.

### **Outline Design and Preparation of Cost Plan**

Once the results of the site investigation are known, an outline design should be prepared and costed. This should be worked up in sufficient detail that it can be used to support planning applications and funding submissions for implementation. Engineering solutions for the main structures would be selected at this stage, and the detailed alignment of the canal finalised where this is not self evident. The outline design should be presented in an outline design report, including advice as to progressing the scheme to construction. It has been found to be advisable to include the production of artist's impressions of key parts of the completed scheme at this stage to support the planning and funding submissions

### **Planning Application and Public Consultation**

The next stage in the process is to obtain planning permission. It has proved to be wise to engage with the public at this stage, with initial public consultation on the proposals being carried out in advance of the application being lodged to minimise the potential for objections. This can take the form of public meetings, leaflet drops (with return comment slips) and exhibitions in local public spaces or shopping areas. It is advisable to engage the support of local politicians and civic leaders if possible to assist in "getting the message over". Formal consultation will be carried out by the Local Planning Authority as part of the consenting process.

Other consents required, such as Land Drainage Consents, Abstraction Licenses, any building consents, Third party approval in principle (e.g. Midland Metro) etc., should also be obtained at this point. These applications will be potentially supported by a specific EIA for the works which would have to be prepared once the outline design is clear.

### **Funding Applications and Fundraising**

In parallel with the application for planning and other consents, the promoters will have to put funding in place to deliver the planned works at this stage. This will involve applications to potential funders (the current funding framework for canal restoration schemes is described in section 6 but is subject to change, and should be monitored continuously by the Partnership for potential opportunities).

### **Detailed Design and Procurement of the Works**

Once consents and funding are secured, detailed design of the scheme can be undertaken to produce the necessary Contract Documentation

### **Land Acquisition / Licensing**

This can take place in parallel along all sections of the canal: the canal line is entirely owned either by CRT or by the local authorities and thus land assembly should be straightforward.

### **Conclusion**

This report forms an initial step to restoration of the Bradley Canal by identifying the scale of the works necessary and the opportunities for enhancement that are created if the scheme proceeds. The scheme is practical although significant funding will be required. The key benefits of the scheme will be seen in local social and economic regeneration, and recreational opportunities whilst also creating a navigation with small but significant benefits to boaters and water management.



**Figure 14: Moorcroft Junction**