



Boston to Peterborough Wetland Corridor

Business Case

On behalf of **Lincolnshire County Council**
in partnership with **The Inland Waterways Association & The Environment Agency**



Boston to Peterborough Wetland Corridor



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Executive Summary

The Boston to Peterborough Wetland Corridor (B2PWC) will create new connections between the Black Sluice Navigation (South Forty Foot Drain) and the River Glen; and between the River Glen and the River Nene, thus creating a 58 mile long navigable link between the town of Boston and the City of Peterborough (blue line in map on Figure ES1). It will mark a significant improvement on the current shortest route (red line) which is approximately 250 miles long (Figure ES1).

Figure ES1: Overview of Proposed Route



The proposal involves:

- the development of new lock infrastructure at the five waterway intersections, in Padholme, Peakirk, Surfleet, Guthram Gowt, and Black Hole Drove
- the dredging and widening of existing waterways where necessary
- improvements to bridge and culvert infrastructure where needed, and
- the creation of new short sections of new waterway where necessary

The cost of the capital work is an estimated £74 million. The additional estimated maintenance cost is £87,000 per annum.¹

The project is expected to benefit the Lincolnshire and Peterborough economies in a number of ways, including:

¹ This includes the estimated cost for the three newly installed locks but excludes maintenance costs of locks already in operation.



Opportunity to tender for
£73.65 million capital works



£50.3 million (PV)
additional tourism
spend



£6.2 million land value uplift



Creation of new routes
for exercise and active
travel



Improved Flood Resilience



Potential benefits for
water security for
irrigation and public
water supply



Supports proposed housing
developments throughout
the B2PWC area



Creation of new, and
preservation of
existing wetland
habitats



£110 million total
contribution to the economy



A positive return on
investment

1 Introduction and Project Overview

1.1 Purpose

- 1.1.1 In January 2020, Lincolnshire County Council (LCC), in partnership with the Environment Agency (EA) and the Inland Waterways Association (IWA) (the Project Partners) appointed Stantec to develop an updated business case for the Boston to Peterborough Wetland Corridor (B2PWC).
- 1.1.2 This business case updates the previous Fens Waterway Link (FWL) Business Case, undertaken in 2004, and has been adjusted to account for the following changes to the project over the intervening period:
- **Focus on Boston to Peterborough section:** The original Fens Waterway Link Business Case included proposals to develop two sections of waterway: A northern section, to create a connection between Boston and Peterborough; and a southern section, to improve navigation between Peterborough, Cambridge and Ely. The Project Partners have since concluded that, whilst in the longer term both sets of those improvements would be beneficial, the existing facilities are sufficient to enable safe and attractive navigable routes in the southern section, and that therefore the focus of current efforts should be on improving the northern, Boston to Peterborough section. This change has significantly reduced project costs, without reducing the full extent of the Fens Waterway Link vision
 - **Identification of further cost saving opportunities:** The Project Partners have also identified further cost saving opportunities along the Boston to Peterborough section including, for example, replacing the proposed two-lock connection between the River Glen and South Forty Foot Drain at Guthram Gowt with a simpler single-lock solution
 - **Development of Partnership Working Opportunities:** The geography and scope of the B2PWC have been designed to maximise the opportunities to work in partnership with local and strategic water stakeholders. This will promote the development of infrastructure and water management methodologies that deliver multi sector benefits
 - **Clarity on preferred routing option:** when the original business case was developed, the partners were still in the process of exploring a range of alternative routing options for the B2PWC. In particular, a decision had still to be reached on whether to use Cat's Water Drain or Car Dyke as the main waterway to connect the River Welland to the River Nene. The Partners have now come to a view on their preferred routing option (details of which are provided later in this section)
 - **Recent work undertaken:** some of the interventions proposed in the previous business case have now been completed, including the sea lock and flood barrier at Black Sluice in Boston. In addition, the partners have made a series of investments to improve the quality of the area's waterway tourism offer, including:
 - Anton's Gowt: Visitor Moorings and the Boston Pendulum art installation (Figure 1.1)
 - Bardney Lock Visitor Moorings, long term moorings and improved facilities
 - Black Sluice Trail: Boston to Hubberts Bridge multi user route
 - Black Sluice: new moorings and refurbishment of semi-derelict buildings to create facilities for boats, a café, shop and office

- Boston Rowing Club Improved River Access Facilities
- Boston Stump multi user bridge
- Boston Visitor Moorings
- Chapel Hill Moorings
- Crowland Slipway and Moorings
- Dogdyke Visitor Moorings
- Drinsey Nook: Limited mobility angling facility
- Fiskerton Fen Visitor Facilities
- Five Mile Bridge, Fiskerton (inc. limited mobility fishing access) (Figure 1.1)
- Four Mile Bar Bridge
- Hubbert's Bridge (inc slipway and visitor moorings)
- Kirkstead Bridge Visitor Moorings
- Langrick Bridge Visitor Moorings
- Lincoln Brayford Pool Visitor Moorings
- Lincoln Canoe Club Improved Water Access
- Lincoln Rowing Club Facilities Development at Stamp End
- Lincoln to Boston multi user trail the Water Rail Way
- Lincoln to Saxilby multi-user trail
- Pinchbeck Moorings
- River Slea Bottom Lock Refurbishment
- Saxilby Moorings Refurbishment
- Sleaford Lift Bridge and Slipway
- South Forty Foot Drain/R Glen Navigation Route Technical Scoping and Options Shortlisting (confidential at the time of writing)
- South Forty Foot Wyberton Visitor Moorings and Disabled Angling Platforms
- Southrey White Horse Inn Moorings
- Spalding Water Taxi
- Stamp End: Artworks including Rowing Club Paintings and Lincoln Cathedral Viewing Platform
- Surfleet Slipway

- Swineshead Bridge
 - Tattershall Bridge Visitor Moorings
 - Torksey Lock Visitor Centre, Visitor Moorings and Tea Rooms
 - Washinborough Visitor Moorings
 - Water Rail Way Art Works – sculptures at various locations
 - West Pinchbeck Visitor Moorings
 - Willow Tree Fen Nature Reserve
 - Wyberton High Bridge in Boston
- **More holistic understanding of project impacts:** the previous business case demonstrated significant tourism benefits from the proposed intervention. While the development of an improved waterway tourism offer for Lincolnshire remains an important objective, the partners also recognise potential significant impacts in other areas. These include, for example, environmental benefits and benefits to water dependent habitats and the ecologies they support; water quality and flood risk management benefits; resilience in raw water supplies to agri-food and the wider economy; health benefits, and the potential to increase land values and open up new development sites
 - **Effects of inflation:** all of the cost assumptions from the previous business case have been updated to 2020 prices, based on data on construction cost inflation as reported in Spon's Price Books

Image 1: Recent Partnership Investments (Boston Pendulum – left; Five Mile Bridge – right)



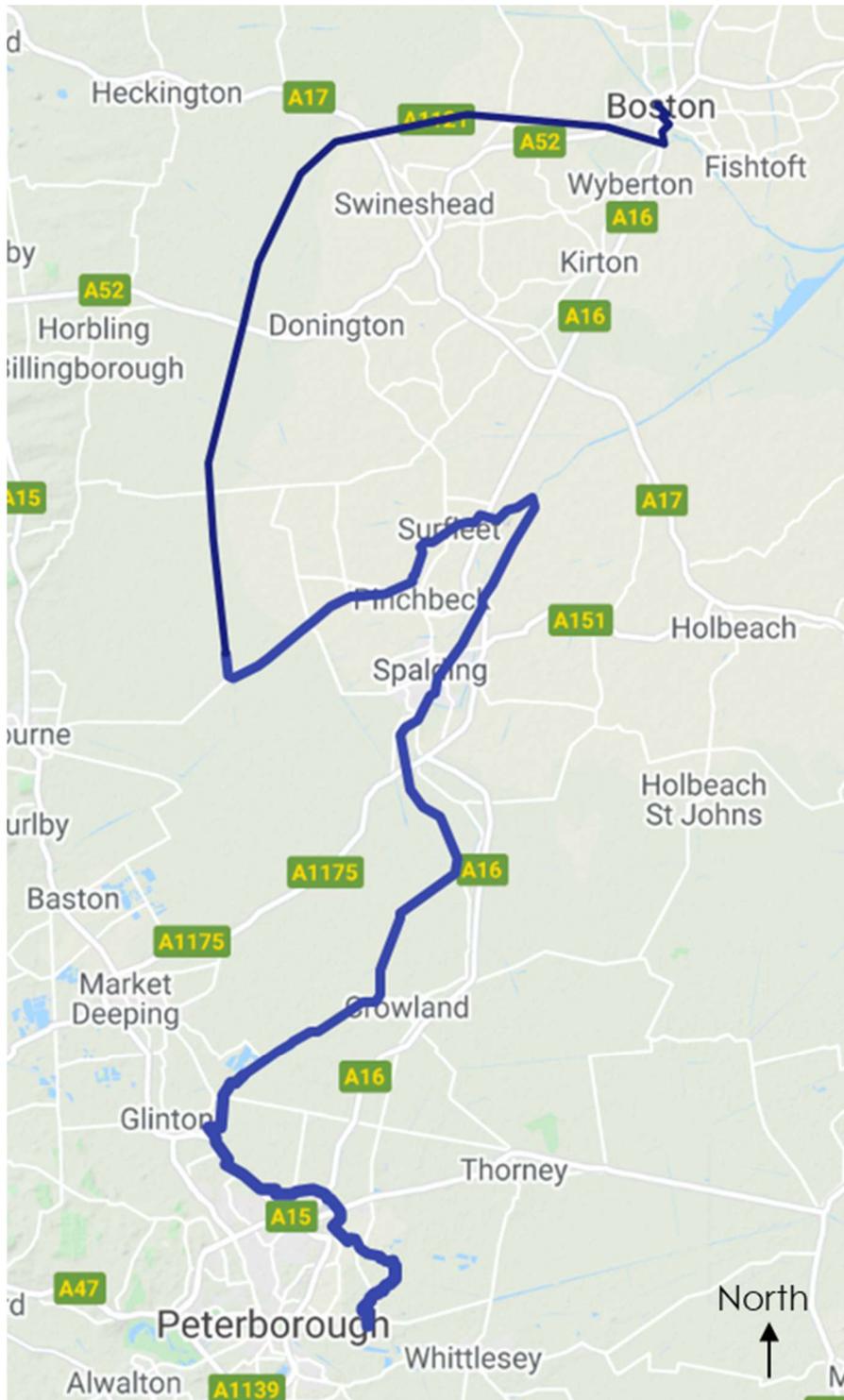
Images credited to Lincolnshire County Council

1.2 Proposed Developments

- 1.2.1 The Boston to Peterborough Wetland Corridor will create new connections between the South Forty Foot Drain & the River Glen; the River Glen & River Welland and the River Welland & River Nene, thus creating a 58 mile long navigable link between the town of Boston and the City of Peterborough. This would be a significant improvement to the current route, which requires passage between the River Witham, the Fossdyke Navigation, the River Trent, the Grand Union Canal and the River Nene. This route which is approximately 250 miles long, involves over 130 locks, takes over a fortnight to navigate and is only suitable for narrow boats.

1.2.2 This section provides details of the proposed route. It will describe, in turn, the proposed sections between the River Nene and the River Welland; between the River Welland and the South 40-Foot Drain (also known as the Black Sluice Navigation) and between the South 40-Foot Drain (Black Sluice Navigation) and the River Witham. The route shown below is reasonably accurate at a strategic level, however the precise route is based on assumptions for the purpose of calculating costs.

Figure 1.1: Map 1 - Overview of Proposed Route

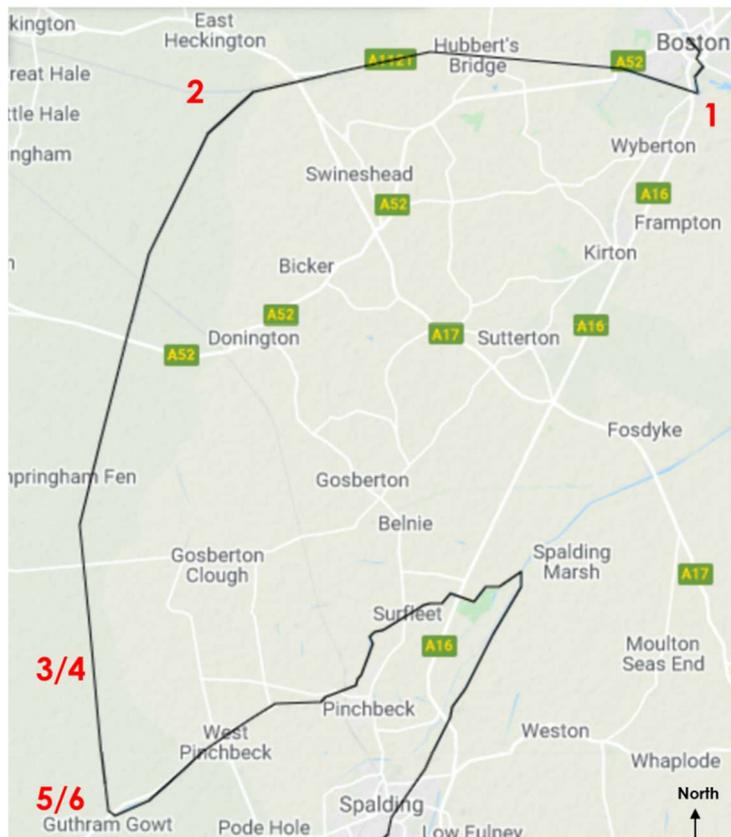


1.2.3 We provide full details of the proposed investments along each stage of the route in the Financial Case section.

South Forty Foot Drain to River Glen

1.2.4 The route begins in Boston, where the River Witham connects to the South 40 Foot Drain (Black Sluice Navigation). It heads out of Boston in a westerly direction towards East Heckington (2), before turning south, passing Black Hole Drove (3/4) towards Guthram Gowt (5/6), where it connects with the River Glen (Figure 1.2)

Figure 1.2: Map 2 of Proposed Route – Boston to Guthram Gowt



River Glen to River Welland

1.2.5 The route would then follow the River Glen in a north-easterly direction from Guthram Gowt (6) to Surfleet Sluice (7/8), before following the River Welland in a south-westerly direction through Spalding (9/10), following the main River Channel through the town rather than the Coronation Channel, and on to Peakirk (Figure 1.3).

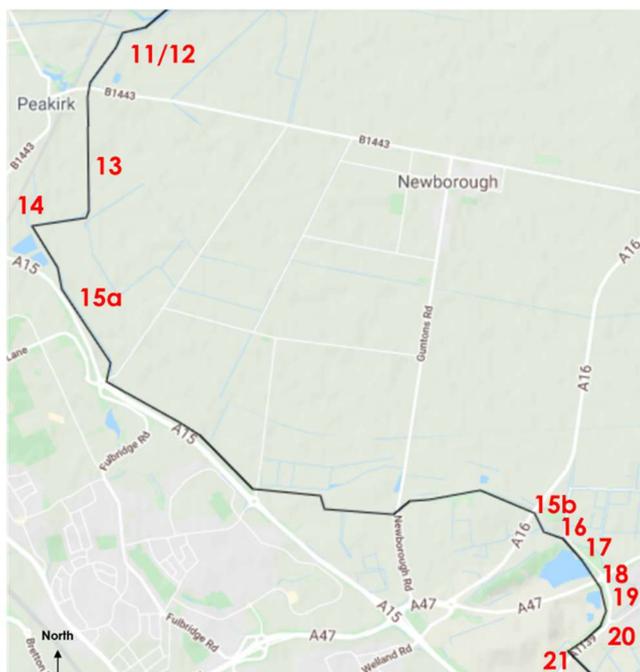
Figure 1.3: Map 3 of Proposed Route – Guthram Gowt to Peakirk



River Welland to River Nene

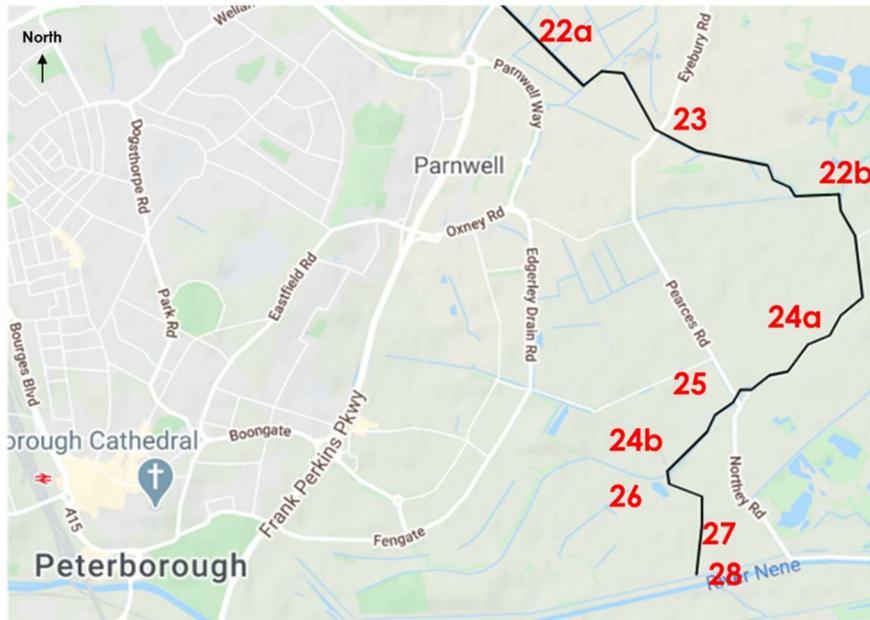
1.2.6 The route will create a new connection between the River Welland and the Folly River at Peakirk Pumping Station (11/12), and will then connect with the Car Dyke at Werrington Lakes (14). It will follow the course of the Car Dyke to Dogsthorpe Star Pit (15a) then follow a newly cut section of waterway around the curtilage of the Pit, before rejoining the Car Dyke and following it to Eye Road (21). (Figure 1.3).

Figure 1.4: Map 3 of Proposed Route – Peakirk Pumping Station to A1139 (Eye Road)



1.2.7 The route then heads south east along Edgerley Commissioner's Dyke and Counter Drain to America Farm (22b), before heading south along Cat's Water Drain to a point close to Flag Fen Bronze Age Centre (26) before following the Padholme Drain to Padholme Pumping Station, where it connects into the River Nene (28) (Figure 1.2).

Figure 1.5: Map 1 of Proposed Route – Padholme Pumping Station to the A1139 (Eye Road)



1.3 Partners and Key Stakeholders

1.3.1 The following organisations all play, or have the potential to play, a significant role:

- **Lincolnshire County Council** has worked in close collaboration with the project partners and a wide range of stakeholder groups for twenty years to increase the economic performance of Lincolnshire's navigations. LCC's 2018 Strategy takes a more holistic approach to waterways development, broadening its scope to reflect the potential for this area of activity to contribute to increased climate change resilience for the environment and the economy. LCC are the lead commissioners for this business case.
- **Inland Waterways Association** - is a membership charity that works to promote, support, protect and restore the UK's 10,500 kilometres of canals and rivers. It has also contributed both financially and with significant technical feasibility support to the development of this business case
- **Environment Agency** – is the UK Government Agency responsible for water quality & resources, inland river, estuary & harbour navigations, and conservation & ecology². It is the Navigation Authority responsible for all the navigable waterways along the course of the B2PWC route (excluding The River Witham), and for this reason is well placed to act as the navigation authority for the proposed developments. It is also a contributing partner to this business case both financially and with significant technical feasibility support
- **Anglian Water** – is the largest water company in England and Wales based on area served, and covers a region which stretches from the Humber estuary, north of

² The EA also has responsibilities for regulating major industry & waste, treatment of contaminated land and fisheries, though these are less relevant to this proposed project.

Grimsby, to the Thames estuary, and from Buckinghamshire to Lowestoft on the east coast. They will be one of the main users of the proposed South Lincolnshire Reservoir

- **Canal and River Trust (CRT)** – CRT is the Navigation Authority for the River Witham. It is a charitable organisation which looks after 3,200 kilometres of waterways in the UK³. The organisation works with communities and volunteers across England and Wales to transform canals and rivers into spaces for people to access and view as a free, accessible and local source of wellbeing
- **Water Resources East (WRE)** – One of the five regional water resource planning groups which support the Environment Agency’s National Framework for Water Resource Management. WRE brings together regulators, companies, retailers and individuals in the water, agriculture, power and environmental sectors. WRE adopt a long-term holistic approach to water provision and preservation. To support this, WRE are currently assisting Anglian Water & Affinity Water to assess the feasibility of developing a new reservoir in South Lincolnshire (precise location to be confirmed)
- **Internal Drainage Boards (IDBs)** - A network of operating authorities established under the 1991 Land Drainage Act, with statutory powers to conduct drainage and water level management works in areas of high flood risk. Four such Boards operate along the proposed B2PWC route including Black Sluice IDB, Welland & Deepings IDB, South Holland IDB and North Level IDB

Image 2: Rowing at Boston (left) Black Sluice café (right)



Images credited to Lincolnshire County Council

³ Canal and Rivers Trust: About Us (2020). Available here: <https://canalrivertrust.org.uk/about-us>

2 Strategic Case

2.1 Benefits

2.1.1 The project is expected to deliver a number of benefits to the local community in the areas of tourism, culture & heritage; flood risk management; water supply management; farming; housing development; commercial development; healthy living; sports & recreation; transport; environment & biodiversity and regeneration. This section explores each in turn.

Tourism, Culture and Heritage

2.1.2 The areas along the proposed B2PWC route have a range of tourism amenities and cultural and heritage assets to attract boating visitors, including:

- **The City of Peterborough:** home to one of the UK's most impressive Norman Cathedrals, plus other heritage assets, theatres and parks
- **Flag Fen:** the site of a Bronze Age village, dating from c. 1,000 BC, containing original remains, and reconstructed roundhouses
- **Green Wheel Cycle Route:** delivered in partnership with Peterborough Environment City Trust to create over 70 kilometres of continuous sustainable routes around Peterborough. This passes close to the proposed B2PWC route at Peakirk and at Flag Fen
- **Car Dyke:** an 135-kilometre navigation channel excavated at some point during the Roman Occupation of Britain (1st to 5th Centuries AD). It should be noted that the Car Dyke through Lincolnshire is separate to the waterway of the same name which flows through Horningsea, Cambridgeshire⁴
- **Crowland:** small historic town in North Holland, which includes a Grade I listed Benedictine Abbey dating from the 8th Century
- **The town of Spalding:** a Georgian town on the River Welland and a historically significant inland maritime port with substantially documented marine services and trading wharves. It is home to the 25-acre Springfield Festival Gardens; 15th Century Ayscoughfee Hall Museum and Gardens. Spalding Water Taxis offer a 40-minute cruise through the town
- **Willow Tree Fen:** a recently created nature reserve, run by the Lincolnshire Wildlife Trust, which is home to a range of waterfowl, including wigeon, teal, mallard, lapwing, redshanks and snipe
- **The town of Boston:** home to nearly 500 listed buildings, including St Botolph's Church (Boston Stump), the largest parish church in England. Boston is also a historically significant inland maritime port with substantially documented marine services and trading wharves.
- **Bardney Railway Heritage Centre:** a centre containing exhibits on the industrial history of the Bardney parish in West Lindsey
- **Woodhall Spa:** former spa town on the southern edge of the Lincolnshire Wolds, which includes the National Golf Centre, and one of the UK's oldest functioning cinemas

⁴ See Jeremy Evans, Stephen Macaulay, Philip Mills, 2017. 'The Horningsea Roman Pottery Industry in Context', *East Anglian Archaeology* 162 (<http://eaareports.org.uk/publication/report162/>) for details

- **The Water Rail Way:** a traffic free cycling route, which follows the course of the River Witham between Lincoln and Woodhall Spa.
- **The National Centre for Craft & Design:** in Sleaford is the largest venue in England entirely dedicated to the exhibition, celebration and promotion of international national and local craft and design.

However, the lack of a navigable connection between the River Nene and the River Welland, and between the River Glen and the River Witham, together with the high tidal range at the connection between the River Welland and River Glen make it difficult to explore all of these attractions by boat in a single trip. Addressing this will not only encourage more visitors to these areas, but would also encourage visits to sites further north, including the Cathedral City of Lincoln, the town of Saxilby, Fiskerton Fen nature reserve, Battle of Britain Memorial Flight, International Bomber Command Centre Memorial and the River Trent. It will also encourage visits to sites further south including the Middle Level navigation, the cathedral city of Ely, the city of Cambridge and the River Great Ouse all the way to Bedford.

- 2.1.3 The B2PWC proposal can support the development of leisure boating tourism in the area, by creating new routes suitable for day cruises, bringing new visitors to the Fenland towns and stimulating tourism spend.
- 2.1.4 The project partners have already identified a range of suitable locations for new inland waterway tourism infrastructure to capitalise on this potential demand⁵, including (Table & Figure 2.1, figures in brackets represent map references):

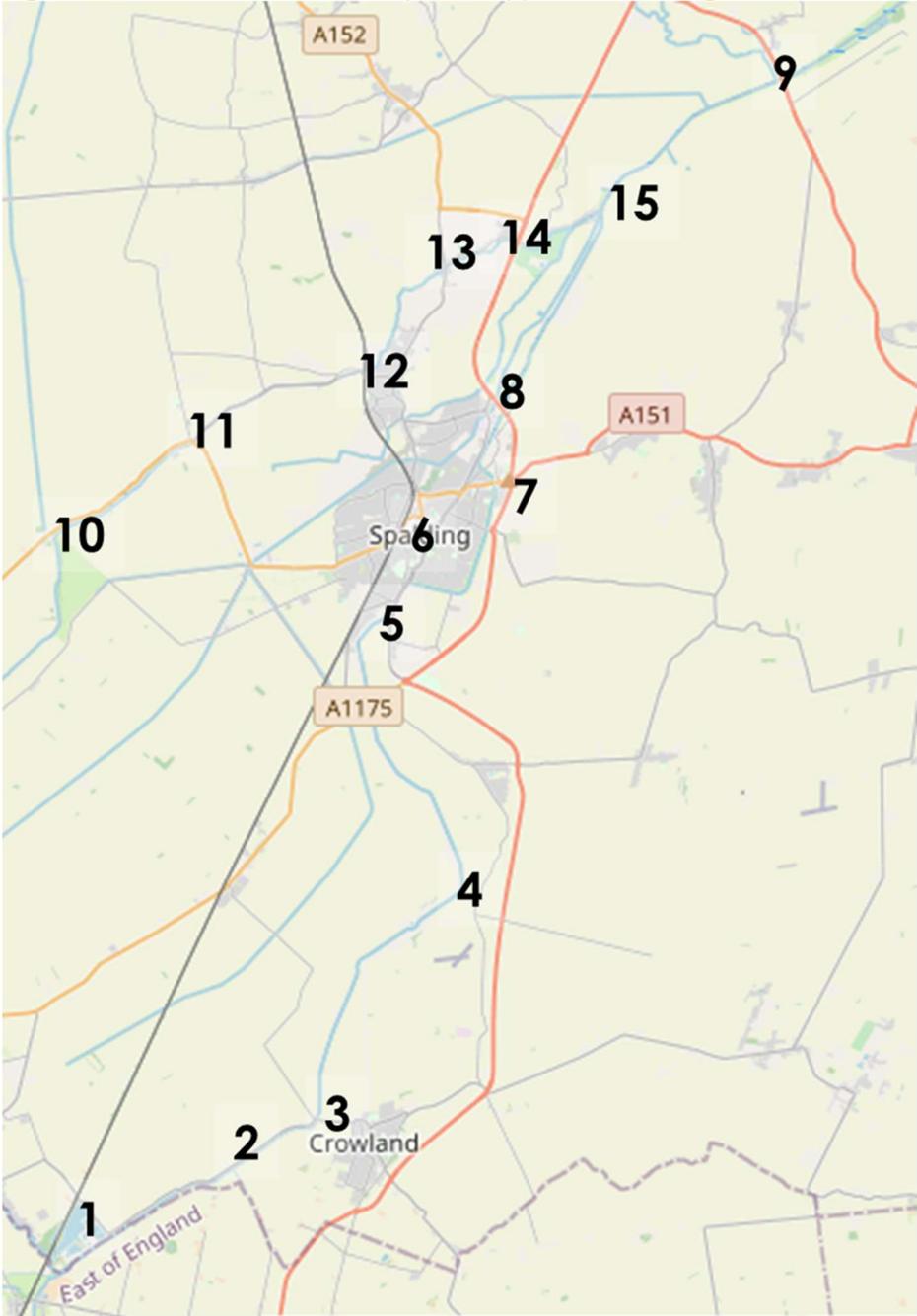
Table 2.1: Future Tourism Development Opportunities Along B2PWC Route

Area (map ref)	Opportunity
Peakirk (1)	Potential marina development and waterway connection and location for chalet development
Kennulph's Stone (2)	Potential marina development and waterway connection
Crowland (3)	Potential marina development and waterway connection
Four Mile Bar Bridge (4)	Major connection with footpath and cycle network
Welland Sailing Club (5)	Marina development and development of watersports centre
Spalding Town Centre (6)	Development of town's waterfront to include visitor and commercial moorings
Coronation Channel (7)	Marsh Road Sluice waterway connection together with moorings, water events and watersports development
Northern Bypass (8)	Potential marina development and waterway connection
Fosdyke Bridge (9)	Existing boatyard and potentially major connection with the footpath and cycle network
Guthram Gowt (10)	Connection with the Black Sluice Navigation and development in association with Willow Tree Fen Nature Research
West Pinchbeck (11)	Existing moorings and canoe access
Pinchbeck (12)	Potential development site at The Ship Inn
Surfleet	Potential for further development at The Village Moorings, The Mermaid (13) and the Riverside Inn (14)
Surfleet Seas End (15)	Connection with the River Welland and Vernatt's Drain. Potential marina site and location for chalet development

Source: Spalding Waterspace Study, The Rivers Welland & Glen (2011)

⁵ Source: Lincolnshire Waterways Partnership, Spalding Waterspace Study, The Rivers Welland & Glen (2011)

Figure 2.1: Future Tourism Development Opportunities Along B2PWC Route



Source: Spalding Waterspace Study, *The Rivers Welland & Glen* (2011); OpenStreetMap Contributors (2020)

- 2.1.6 The Environment Agency are the navigation authority for the majority of the waterways along the B2PWC route (apart from the Witham, where the Canal & River Trust are the navigation authority). This provides an opportunity to reduce the level of paperwork visitors are required to fill out in order to navigate the waterways (visitors can apply for a gold licence, which allows them to use the navigations of both of these organisations during their trip, plus other nearby navigation authorities)
- 2.1.7 The B2PWC will stimulate interest in, enable people to access, and be developed in a manner sensitive to the conservation of several key cultural and heritage assets in Lincolnshire and Cambridgeshire.
- 2.1.8 The project partners have opened discussions with Historic England about identify ways to ensure that the project is supportive of, and is not in any way detrimental to, the protection of the area's heritage assets, and Historic England are keen to be involved in the project as partners. Historic England should be given the opportunity to participate in any discussions around:
- **The development of visitor moorings at Flag Fen:** to ensure that these do not harm the special interest of the scheduled monument
 - **The protection of the artifacts at Flag Fen:** Historic England has expressed concerns about the extent to which the site is currently drying out, and the impact that this is having on the artifacts. The proposed project may allow for the movements of water in a way that can protect these artifacts
 - **Developing a better understanding of the historic significance of Car Dyke:** Historic England has asked to be involved as a partner in any activities to dredge the Car Dyke as they see this as an opportunity to better understand the water course and its history.

Flood Risk Management

- 2.1.9 The B2PWC will create opportunities to increase storage capacity within catchments, contributing to flood risk management and increased resilience to drought, both of which have strong links to climate change.
- 2.1.10 The River Welland catchment has a history of flooding, with the most significant event occurring in 1947, but with less severe events in 2000 and 2004⁶. Half of the properties in the northern areas of Peterborough are susceptible to flooding, as are 15% of properties around the Surfleet Reservoir.
- 2.1.11 Flood risk along the B2PWC route is currently managed through a combination of approaches including widening, straightening, and embanking of rivers, building relief channels, construction of flood storage reservoirs, the construction of flood walls, and tidal gates. These measures are designed to control the flow of water and provide temporary storage such that their impacts can be mitigated. The proposed B2PWC investment will contain several flood risk management and mitigation measures of this kind (see section 3 for details on the measures proposed).
- 2.1.12 The project partners have engaged closely with regional drainage boards and authorities to ensure the design complements existing facilities and will support and enhance regional resilience to flooding.
- 2.1.13 The partners are also working together on major flood resilience projects on the River Sleas and the River Witham. These involve:

- the repair and strengthening of key flood risk assets such as critical embanked sections of channel
- increasing storage capacity in the flood plain, to reduce pressure on embankments
- decommissioning, removing or transferring assets currently offering little flood risk benefit, which carry a maintenance liability and use flood risk budgets (this could include some non-critical embanked sections of water course, historical lock sites and retaining structures)
- creating more channel capacity through enhanced maintenance and maybe the creation of some sections of wider 2 stage channels

Water Supply Management

2.1.14 Lincolnshire and the East of England are experiencing high and growing water demand. Office for National Statistics (ONS) figures indicate that the East of England was home to 6.2 million people in 2018, a figure projected to rise by 9.2% to 6.75 million by 2040. The area is also an important source of water for the Greater South East, comprising the East, South East and London. This area has a population of 24.25 million (40% of the UK population) and is expected to grow by 8.7% to 26.35 million by 2040. The B2PWC could help address some of these challenges by supporting the development of Water Resources East's proposed South Lincolnshire Reservoir.

Farming

2.1.15 Lincolnshire has the UK's largest and most productive food sector, with a Gross Value Added (GVA) per employee of £30,000, compared with a UK average of £18,000⁷. It is a market leader in many intensive crop and livestock categories, producing⁸:

- 25% of England's total vegetable crop;
- 21% of ornamental crops;
- 19% of sugar beets;
- 17% of all poultry chicken⁹
- 18% of ducks; and,
- 21% of turkeys.

2.1.16 The agricultural sector accounts for 4.9% of all employment in Lincolnshire, compared to a UK average of 1.3%¹⁰.

2.1.17 Despite these strengths, the agriculture sector in the region faces some challenges including climate change and long-term challenges in water supply, with the industry's total demand for water expected to increase by circa 30% by 2030¹¹.

2.1.18 The B2PWC project has the potential to support agri-food and rural diversification opportunities.

⁷ Greater Lincolnshire Agri-Food Sector Plan 2014-2020.

⁸ Ibid.

⁹ Excluding eggs

¹⁰ Water Resources East Emerging Strategy

¹¹ Source: Greater Lincolnshire Agri-Food Sector Plan 2014-2020. The document also identifies under-developed research infrastructure, poor road connections to priority national markets, over-reliance on migrant workers and relatively low levels of investment in technology compared with competitors as further challenges for the sector

Housing

- 2.1.19 By creating new inland waterway navigations, and improving existing navigations, the project could act as a catalyst to the development of new areas of housing along the proposed route. It can make sites more attractive to developers by:
- providing waterfront settings, and access to active travel and leisure amenities, which may have an increasing appeal to end users; and
 - providing drainage to sites, thus in some cases reducing the requirement for the developer to build their own sustainable urban drainage systems (SUDS), and increasing the proportion of the site that can be used for housing.
 - The proposed B2PWC route is likely to have a particular impact on the Norwood development site in Northern Peterborough. The Car Dyke section of the B2PWC passes through this site, which has been classified as an Urban Extension Area in the 2016-2036 Peterborough Local Plan, with 2,000 new dwellings assigned to it.

Healthy Living / Sports and Recreation

- 2.1.20 The B2PWC project will create new waterways, connecting the settlements of Boston, Spalding, Surfleet, West Pinchbeck and Peterborough. One of the project objectives is to provide a sport and recreation resource to local residents in each, by providing an easy, safe and attractive environment for outdoor exercise and enjoyment, providing greater access to explore the surrounding countryside.
- 2.1.21 The section of the B2PWC route between Peterborough and Spalding will run alongside National Cycle Route 12 (London to Spalding). Sustrans has a long term aspiration to extend this route north eastwards from Spalding to Fosdyke, where it could join National Cycle Route 1 (Dover to Shetland), but has so far been unable to invest in this project, as the area does not currently attract enough cyclists to make the proposal economically viable. By attracting more visitors to the Fens area, this project could support the development of this project.

Transport

- 2.1.22 The proposals will increase the appeal of the existing towpaths, footpaths and cycle-routes along South Forty Foot Drain and the River Witham, thus supporting the Boston Transport Strategy (2016-2036)'s vision to create new traffic free cycle routes along the waterways to improve connectivity between residential areas, the town centre, and areas of employment.
- 2.1.23 The proposals also involve dredging of a number of stretches of waterway (full details provided in Section 3), which will increase their capacity to convey floodwater, thereby reducing the risk of flooding to the surrounding area and reduce the risk of flooding on the area's road and rail network.

Environment & Biodiversity

- 2.1.24 The proposed route passes close to several conservation areas and sites of special scientific interest, including the sites of special scientific interest at Baston Fen, Thurlby Fen; Dogthorpe Star Pit, Cross Drain, Surfleet Lows, Deeping Gravel Pits, Langtoft Gravel Pits, The Wash Ramsar, Special Protection Area and The Wash and North Norfolk Special Area of Conservation
- 2.1.25 The project will be constructed in a manner that protects the environment and bio-diversity of these sites, and of the wider route, and the project partners are working with Natural England to ensure that all potential environmental and biodiversity risks are identified and mitigated.
- 2.1.26 The project is also likely to bring about several environmental improvements, including:

- **Flood risk management:** reducing the risk of habitat along the route being lost to flooding
- **Wildlife corridors:** leading to the creation of safe movement corridors for local wildlife
- **Planting of new peat fenland, wetland habitat and trees:** acting as a carbon sink to improve local air quality, and contribute to global carbon reduction targets

2.1.27 While care will need to be taken to ensure that the proposal does not lead to the introduction of invasive and non-native species (INNS), it should be noted that the project will create opportunities to monitor and react better to changes in water conditions, and to control water movements.

Partnership Building

2.1.28 The project partners have a long and successful history of working collaboratively on infrastructure development, including the Boston Pendulum, Five-Mile Bridge, the Lower Witham Flood Resilience Project and the River Slea Flood Resilience Project. They also have a successful history in working with other local organisations, including working with Sustrans to create a cycle route from Boston to Hubbert's Bridge. This project provides an opportunity to deepen and strengthen those partnerships, including Peterborough Environment City Trust by linking to and extending The Green Wheel Cycle Route.

2.1.29 The scope and geography of the B2PWC have been specified to align with the objectives of a wide range of water stakeholders including Greater Lincolnshire LEP's *Water for Growth* strategy, Lincolnshire County Council's *Waterways Development Strategy*, as well as to the strategic objectives of The Lincolnshire Wildlife Trust, The Environment Agency, Anglian Water and Water Resources East.

2.2 Case for Change

2.2.1 This section explains the project's objectives, sets out the market failure rationale for intervention, sets out what activities are expected to take place in the counterfactual scenario and provides a logic model to explain the process through which these objectives will be achieved.

Image 3: Proposed design for a new pedestrian bridge in Boston (left), Boston Moorings (right)



Images credited to Lincolnshire County Council

Project Objectives

2.2.2 The previous business case identified the following project objectives (Figure 2.2):

Figure 2.2: B2PWC Project Objectives

<p><u>Regeneration</u></p> <ul style="list-style-type: none"> • Act as catalyst for economic and social renewal • Increase development value and the opportunity for investment • Focus and bring together regeneration opportunities • Generate long term economic activity and opportunities for employment • Promote social inclusion and quality of life • Engaging and inspiring the next generation to get active and involved 	<p><u>Sport and Recreation</u></p> <ul style="list-style-type: none"> • Provide an important sport and recreation resource • Contribute to the health and well-being of society • Form corridors linking urban areas to the countryside • Promote accessibility to all members of society • Create a new fishery of national importance 	<p><u>The Natural Environment</u></p> <ul style="list-style-type: none"> • Sustain and enhancing habitats and support rare species • Incorporate sustainability principles at all stages of the project • Contribute to open space provision • Provide a resource for water supply, water transfer and land drainage • Protect and enhance water quality and contribute to flood risk management • Natural capital – Benefit for all, engaging people to get involved
<p><u>Heritage and Culture</u></p> <ul style="list-style-type: none"> • Form a unique heritage, cultural, educational, landscape and environmental asset • Provide access to a wide array of important historic buildings and structures • Opening up new opportunities on our existing waterways and the heritage these have 	<p><u>Tourism</u></p> <ul style="list-style-type: none"> • Act as a tourism asset in its own right • Provide a link between existing and new attractions • Support the holiday industry through water-based activities • Enhance the environment and attract increased visitor activity 	<p><u>Transport</u></p> <ul style="list-style-type: none"> • Contribute to integrated transport objectives • Provide transport routes on a local and regional scale • Act as a waterborne transport corridor for people and freight • Form important cycling, walking and public access corridors

Market Failure Rationale

2.2.3 This section has demonstrated the significant externality benefits that the project can bring for neighbouring communities, and for the area’s tourism and farming sectors. These externality benefits provide a market failure justification for public sector investment in the project, according to the rules of public sector funding as set out in HM Treasury Green Book, the UK Government’s on appraising proposed public sector investments.

Counterfactual Scenario

2.2.4 The counterfactual (Do Nothing) scenario will see a substantially lower level of B2PWC development. Any development which does come forward is likely to be piecemeal in nature and may not integrate holistically with the wider project’s ambitions. The completion of the full scheme would likely be substantially delayed, if it ever materialises.

Logic Model

2.2.5 The benefits of the project are summarised in the logic model overleaf (Table 2.2).

Table 2.2 Project Logic Model

Input	Activity	Output	Outcomes	Impact
<ul style="list-style-type: none"> - £73.65m capital investment (through combination of public & private sector partners) - £57,540 per annum maintenance cost (through sustainable revenue sources) - Project management and leadership from Lincolnshire County Council, Environment Agency and Inland Waterways Association - Strategic support from Peterborough City Council, Cambridge & Peterborough Combined Authority, South Holland Council, Boston Borough Council, Water Resources East, Anglian Water, Sustrans, Lincolnshire Wildlife Trust, Canal & River Trust and Internal Drainage Boards 	<ul style="list-style-type: none"> - Creation of new waterway connections at Padholme, Peakirk and Guthram Gowt - Widening and deepening of existing waterways - Creation of new waterway channels where required - Repair and improvement to bridges and culverts where required 	<ul style="list-style-type: none"> - Creation of a 58-mile navigable route between Boston and Peterborough 	<ul style="list-style-type: none"> - Increased waterway tourism - Flood risks mitigated - Improved water supply management for local communities and for the farming sector - Stimulus for housing development, particularly at Norwood (Peterborough) - New active travel routes - Increased biodiversity - Improved partnership working 	<ul style="list-style-type: none"> - Increased prosperity and improved quality of life for Lincolnshire and Peterborough residents

Source: Stantec, 2020

3 Financial Case

3.1 Project Costings

3.1.1 This section updates the costings for the Boston to Peterborough Wetland Corridor from the 2004 business case to:

- account for changes to the route as agreed by the project partners
- account for the impacts of 16 years of building cost inflation¹²
- remove cost items already funded and built since the original costing exercise
- identify potential cost savings which can be incorporated into design, without reducing project benefits

3.1.2 The effects of inflation have been accounted for by uprating each identified cost by an appropriate multiplier factor using data from SPON'S Civil Engineering and Highway Works Price Book 2020, 34th Edition¹³

South 40-Foot Drain (Black Sluice Navigation) to River Glen

3.1.3 The total cost of the improvements required to establish a navigable link from South 40-Foot Drain (Black Sluice Navigation) to the River Glen is estimated as £14.18 million. Most (£11.15 million) of this is required to create a new 2.5km channel to connect the two navigations.

3.1.4 The estimated annual maintenance cost of this section of the route is £10,740 (see Table and Figure 3.1).

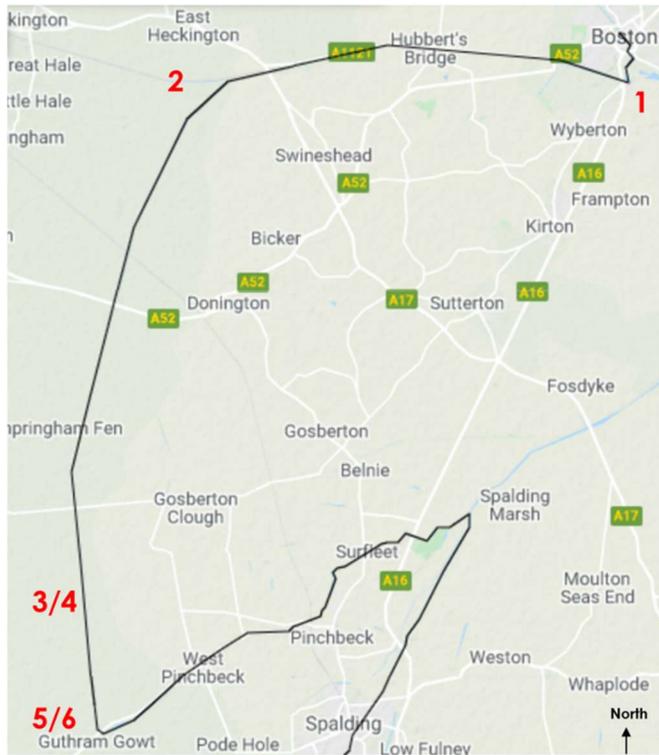
Table 3.1: Project Costs for South 40-Foot Drain (Black Sluice Navigation) to River Glen

Map Ref.	Description	Est. Capital Cost (£m)
3-6	New Channel Black Hole Drove to Guthram Gowt 2,500m	11.15
3	Caswell's Bridge strengthening	0.08
4	Lock at Black Hole Drove	1.85
5	A151 bridge	1.1
	Total Cost of South 40-Foot Drain to River Glen section	14.18

¹² This provisional cost estimate is provided for guidance purposes only. Stantec accepts no liability for any damage, loss, expenses or cost incurred as a result of relying on the information provided in the cost estimate. The cost estimate was derived from a mixture of nationally published sources and the application of Stantec's reasonable skill and care, but may be subject to site specific, seasonal, regional and other such cost variations of which Stantec is unaware. As such the estimate should not be relied upon for tender or procurement purposes. For accurate costing advice the assistance should be sought of a suitably qualified Quantity Surveyor.

¹³ 447 separate cost items were up-rated in this way. Where this was not possible (for example, where appropriate data was not available through SPONS), we applied an inflation multiplier of 1.4138, based on the average inflation rate across the 447 items inflated using the SPONS method.

Figure 3.1: Route from South 40 Foot Drain (Black Sluice Navigation) to River Glen



River Glen to River Welland

3.1.5 The total cost of the improvements required to establish a navigable link from the River Glen to the River Welland is estimated as £12.27 million. The most significant investments required for this section of the route will include:

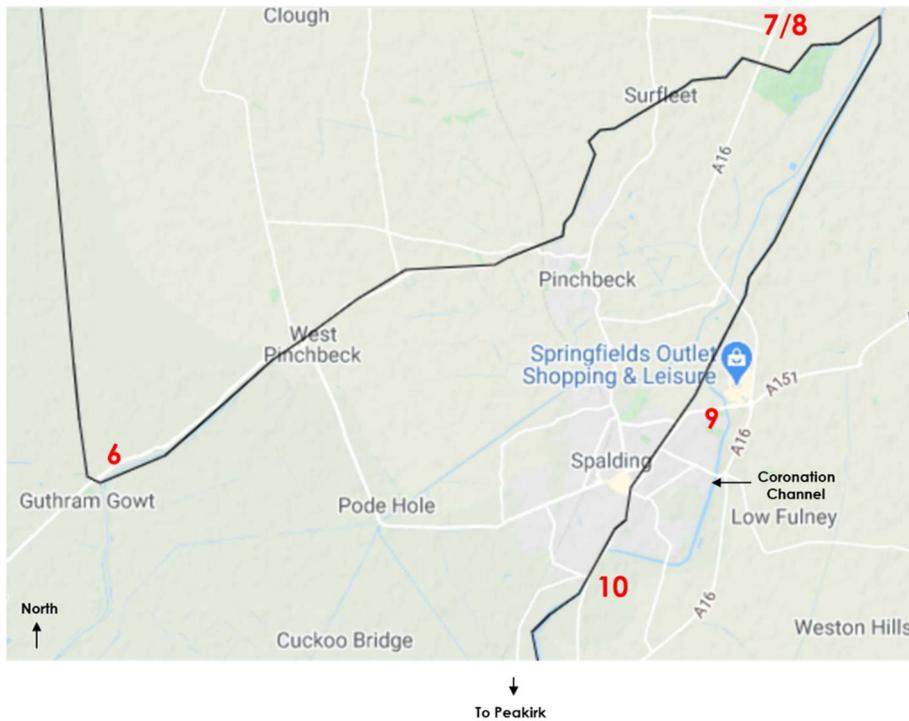
- the replacement of Surfleet Sluice with a Navigation Lock, at an estimated cost of £7.9 million
- the installation of a new lock at Guthram Gowt, connecting the South 40 Foot Drain to the River Glen, at an estimated cost of £1.85 million; and
- the refurbishment of Fulney Lock, Peakirk, at an estimated cost of £1.8 million

3.1.6 The estimated annual maintenance cost of this section of the route is £13,100 (see Table and Figure 3.2)

Table 3.2: Project Costs for Glen to River Welland Section

Map Ref.	Description	Est. Capital Cost (£m)
6	Lock connecting South 40-Foot Drain up to River Glen	1.85
7	Pontoon at River Welland to River Glen, all tides afloat	0.30
8	Replace Surfleet Sluice with Navigation Lock	7.90
9	River Welland dredging and channel works	0.42
10	Fulney Lock refurbishment	1.80
	Total Cost of River Glen to River Welland section	12.27

Figure 3.2: Route from River Glen to River Welland



River Welland to River Nene

3.1.7 The total cost of establishing a navigable link from the River Welland to the River Nene is estimated as £51.71 million. The most significant investments on this section of the route will include:

- Deepening and widening a 2.6km section of the Counter Drain from A1139 (Eye Road) to California Farm at an estimated cost of £16.8 million
- Deepening and widening a 2.1km stretch of Cats Water Drain from Poplar Farm to Flag Fen, at an estimated cost of £13.4 million
- Dredging an 8km stretch of the Car Dyke between the Folly River and the A47, at an estimated cost of £3.37 million
- Deepening and widening a 500m stretch of Padholme Drain between Flag Fen and Padholme Pumping Station at an estimated cost of £3.2 million

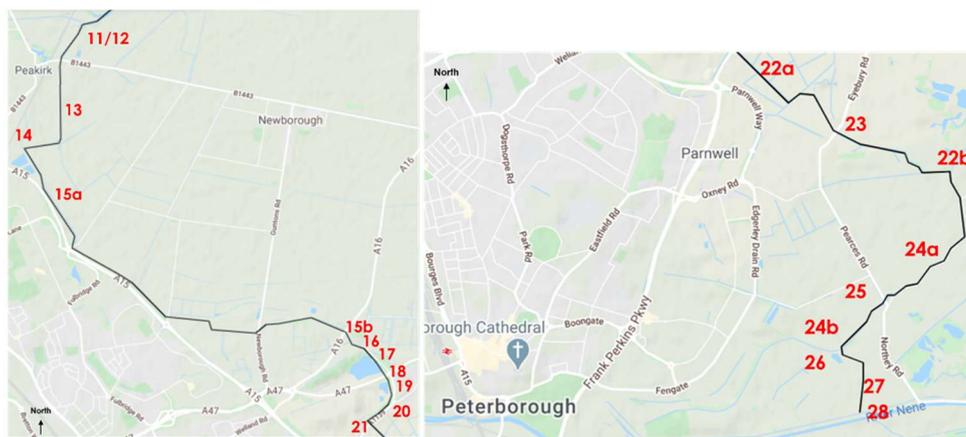
3.1.8 The section will also require the installation of new locks at Padholme Pumping Station (£1.88 million) and at Peakirk Pumping Station (£1.2 million)

3.1.9 The estimated annual maintenance cost of this section of the route is £73,700 (see Table and Figure 3.3).

Table 3.3: Project Costs: River Welland to River Nene Section

Map Ref.	Description	Est. Capital Cost (£m)
11	Lock at Peakirk	1.2
12	Peakirk pumping station by-pass channel 200m	1.87
13	Folly River to Peakirk Pumping Station (no work budgeted)	0
14	Widen Dog leg bend – Folly River	0.76
15a-15b	Dredge Car Dyke A47 culvert to Folly River (dog leg) 8,000m	3.37
16	Navigable Culvert under accommodation track	0.74
17	New 515m build channel A47 culvert (beside Dogsthorpe Star Pit) to Car Dyke	2.29
18	A47, new navigable culvert	0.95
19	New build channel (beside landfill site), Car Dyke to A47culvert– 360m	1.6
20	Dredge Car Dyke channel A1139 culvert to A1139 roundabout - 400m	0.17
21	A1139 new navigable culvert	0.74
23	Eyebury Road, remove existing culvert and build new road crossing	0.74
22a-22b	Deepen/widen 2.6km of Counter Drain/Edgerly Commissioner’s Dyke to A1139	16.8
25	Pearces Road, remove existing culvert and build new road crossing	0.74
24a-24b	Deepen and widen 2,100m stretch of Cats Water Drain from Flag Fen to Poplar Farm	13.4
26	New build channel 300m past Flag Fen to join Cats Water Drain	1.34
27	Deepen and widen Padholme Drain - 500m	3.2
28	Lock and aqueduct Nene to Padholme Drain	1.88
	Total Cost: River Nene to River Nene section	51.71

Figure 3.3: Route from River Welland to River Nene



Potential Cost Savings

- 3.1.10 This analysis has identified an opportunity to generate £5.14 million of cost savings by retaining all the spoil from dredging and excavations on-site, and using this for the creation of pathways/cycleways along the route/s (possibly alternating sides to enable views beyond the immediate proximity of the waterways) or installation of features along the otherwise flat landscape (though we have estimated that there would be a £1.6 million cost associated with this).
- 3.1.11 There is also an opportunity to save a further £0.97 million by reducing waterway depth from 1.8m to 1.6m. This still complies with Environment Agency guidance, which requires 1.5m depth as a minimum.
- 3.1.12 The net savings associated with these actions is £4.51 million.

Cost Summary

- 3.1.13 The total capital costs of the Boston to Peterborough Wetland Corridor is an estimated £73.65 million. The maintenance cost is an estimated £97,540 per year, equivalent to £3.0 million over a 30-year period (See Table 3.4).

Table 3.4: Summary of Project Costings

Description	Est. Capital Cost (£m)	Est. Maintenance Cost (£'000s)
South Forty Foot Drain to River Glen	14.18	10.74
River Glen to River Welland	12.27	13.1
River Welland to River Nene	51.71	73.7
Total Cost of Boston to Peterborough Wetland Corridor (before deduction for Identified savings)	78.16	97.54
Less Potential cost savings	4.51	0
Equals Total Cost of Boston to Peterborough Wetland Corridor (exc. Identified savings)	73.65	97.54

3.2 Funding Options

- 3.2.1 While no decisions have yet been made on how capital costs will be funded, potential sources of funding could include:
- Local Government and Local Enterprise Partnerships:** Lincolnshire County Council has commissioned this analysis and has already indicated that it is willing in principle to provide financial support, while Boston Borough Council, South Holland District Council, Peterborough City Council and Cambridgeshire & Peterborough Combined Authority have all offered their advice and insights to this study, and offered to provide strategic support
 - South Lincolnshire Reservoir:** a group of water companies will work collaboratively with other stakeholders to create a new organisation that is independent of the water companies to manage the reservoir. It is anticipated that Direct Procurement for Customers (DPC) will be considered as the likely route for this scheme. This proposal would enable third party providers to compete to design, construct, finance and operate the infrastructure project. An assessment of this and alternative procurement strategies will be carried out as the proposal is developed. This organisation may see the development of the B2PWC as strategically important to the delivery of their objectives

- **Environment Agency:** The Agency has also contributed to the funding of this analysis and has indicated a willingness in principle to make a financial contribution towards the capital works.
- **UK Government Competitive Funding:** While the project is arguably at too early a stage to make a compelling funding case to existing competitive funding programmes, such as the Town Deal (which Boston qualifies for) or the Future High Streets Fund (which Holbeach qualifies for), there may be opportunities to apply for project funding through future rounds of these funds. There may also be an opportunity for funding via the proposed Shared Prosperity Fund, currently being developed as a replacement for EU Structural Funding, or for funding for towpath developments through the Department for Transport. While the funding mechanism for this fund is yet to be agreed, research by the House of Commons Library suggests that Lincolnshire is one of six areas of the UK that would qualify for 'less developed region' funding should a similar funding mechanism to the Structural Funds approach be adopted.
- **Sustrans:** the organisation has indicated to us that they would be in a position to fund cycle routes across the length of the B2PWC, provided that they adhered to certain defined standards around lighting and surface quality, and if a business case for the routes can be presented with a sufficiently high benefits-cost ratio.

3.2.2 There are a number of potential revenue generating opportunities associated with this project, including:

- **Registration:** the project is likely to generate an increase in boat traffic on all of the waterways that form a part of the B2PWC, and this will generate additional revenue for the Environment Agency, who are expected to be the navigation authority for this route
- **Tourism infrastructure:** the project is likely to stimulate opportunities for moorings, boat hire, hospitality and accommodation services. There may therefore be opportunities for project partners to either invest profitably in new tourism infrastructure or to extract financial contributions from private developers of such infrastructure.
- **Sale of land assets:** the project could generate an increase in land values, and increased demand for land for housing. There may therefore be opportunities for project partners with land holdings along the development corridors to benefit financially from the sale of these assets.

3.2.3 While a full assessment of the value of these income streams has yet to be undertaken, it may be the case that the profit generated from these income streams could be sufficient to cover the £97,540 per annum maintenance cost.

Image 4: Cyclists enjoying Lincolnshire waterways (left) River Glen at Surfleet (right)



Images credited to Lincolnshire County Council

4 Economic Case

4.1 Introduction

- 4.1.1 The B2PWC project is likely to lead to significant economic benefits in the areas of construction & maintenance, tourism, health, land value uplift, and flood risk mitigation.
- 4.1.2 As part of this project, Stantec has developed a bespoke economic impact model to estimate the aggregate gross economic impact of the project on the combined Lincolnshire & Peterborough economy. All of the impacts presented here are estimated annual impacts in 2020 prices.

4.2 Construction & Maintenance

- 4.2.1 As stated in the financial case, the total capital cost of the B2PWC project is estimated at £73.65 million. We have assumed these costs will be evenly split across years 1-3 of the project. We also assumed that the £97,540 average annual maintenance cost will be incurred from year 4 onwards.
- 4.2.2 Based on figures from the ONS Blue Book, it is assumed that 62% of construction costs will take the form of 'Gross Value Added' costs (e.g. developer profit or wages for construction workers), while the remaining 38% will take the form of 'cost of sale' costs (e.g. material and machinery costs) (Table 4.1).

Table 4.1: Construction & Maintenance Impacts

Option	Value	Source
A. Total spend (construction, £m)	74	Stantec 2020, based on Atkins, 2005
B. Total spend (maintenance, £m)	0.1	Stantec 2020, based on Atkins, 2005
C. Turnover to GVA ratio (%)	62%	ONS Blue Book 2019, IO Supply & Use Tables
D. GVA per year (construction, £m)	15.22	= A x C
E. GVA per year (maintenance, £m)	0.06	= B x C

Source: Stantec 2020

4.3 Tourism

- 4.3.1 We have based our tourism impact analysis on a similar approach to that used in the original business case, updating figures to account for inflation where necessary. We summarise the results of this impact assessment in Table 4.2 overleaf.

Table 4.2: Tourism Impacts

Option	Value	Source
A. Number of hire boats available	62	Atkins, 2005
B. Boat hires per year	25	Atkins, 2005
C. Weekly hire fee	1000	Stantec, 2020
D. Annual boat hire revenue (£m)	1.5	= A x B x C
E. Average spend per visit per day	£37	UK Day Visitor Survey 2018
F. Boat visitor spend (£m)	0.4	= ((A * B) * E * 7
G. Number of additional cycle visits	260	Stantec 2020 ¹⁴
H. Non-local cycle tourism spend	0.5	= E x G x 52
I. Number of boats moored on new waterway	285	Atkins, 2005
J. Average annual expenditure on boat maintenance	£2,630	Atkins, 2005, with 15 year's inflation applied at 2% per annum
K. Total spend on mooring & maintenance (£m)	0.7	= I x J
L. Trips made by private boats per year	16	Atkins, 2005
M. Private boat visitor spend (£m)	0.2	= E x I x L
N. Trip, restaurant and day boat spend (£m)	0.2	Atkins, 2005, with 15 year's inflation applied at 2% per annum
O. Total additional tourism spend per annum (£m)	3.6	= D + F + H + K + M + N

Source: Stantec 2020¹⁵

4.4 Health

- 4.4.1 The project is likely to bring about health benefits by attracting additional walkers, runners and cyclists to the towpaths and riverside paths. We have modelled the potential health impacts of this project, based on an indicative assumption that the project will attract an additional 20 walkers and 20 cyclists per mile, per day. We show the results in Table 4.3 below.

Table 4.3: Health Impacts

	Walkers & Runners	Cyclists	All users	Sources
A. Distance in miles	58	58	58	Original business case (supporting report 2, table 2A)
B. Assumed additional visits per mile per day	20	20	40	Stantec
C. Number of additional people exercising	1,160	1,160	2,320	= A x B
D. Mortality rate under 'no exercise' scenario	0.223%	0.223%	-	World Health Organisation
E. Number of deaths under 'no exercise' scenario	2.6	2.6	5.2	= C x D
F. Reduction in risk associated with 'full fitness' scenario	11%	22%	-	Stantec calculation using data from National Transport Survey, and various assumptions around distance walked by users
G. Potential lives saved	0.3	0.6	0.9	= E x F
H. Value of each preventable casualty (£m)	1.6	1.6	-	DfT Transport Analysis Guidance
I. Reduced Mortality Benefits associated with having full fitness	0.5	0.9	1.4	= G x H
J. Years of additional continuous exercise needed to achieve full fitness	5.00	3.00	-	Stantec calculation. Assumes 5 years needed to achieve full fitness, adjusted to account for levels of fitness that users may already have
K. Health benefit	0.10	0.31	0.41	= I x J

Source: Stantec 2020

¹⁴ Conservative assumption of 10 non-local visits per week, over a 26 week season

¹⁵ For caution, and to avoid the risk of double counting, we have not included towpath users in these figures

4.5 Land Value Uplift

- 4.5.1 The proposed B2PWC route passes through the Norwood Urban Extension Area areas of northern Peterborough, where 2,000 new dwellings are planned.
- 4.5.2 The proposed development will increase the attractiveness of this site to developers by providing a waterfront setting; and by providing drainage.
- 4.5.3 Based on an indicative assumption that 5% of any land value uplift generated can be attributed to the B2PWC project, the project is estimated to support a land value uplift of £6.2 million over the course of the appraisal period¹⁶ (Table 4.4).

Table 4.4: Land Value Uplift Impacts

Indicator	Value	Source
A. Number of additional houses to be developed along the proposed route	2,000	Stantec, 2020
B. Average UK plot size (m ²)	275.6	MHCLG English Housing Survey *
C. Total area of land to be developed for housing (ha)	68.9	= (A x B)/10,000
D. Average cost per ha of housing land (£)	£2,285,000	MHCLG Land Value Estimates for Policy Appraisal 2017 **
E. Average cost per ha of agricultural land (£)	£22,250	MHCLG Land Value Estimates for Policy Appraisal 2017 **
F. Land value uplift per ha (£)	£2,262,750	= D - E
G. Total land value uplift (£m)	125	= C x F
H. Attribution assumption (%)	5%	Stantec, 2020
I. Total attributable land value uplift (£m)	6.2	= G x H

Source: Stantec 2020

4.6 Flood Risk Mitigation

- 4.6.1 Based on evidence from the Witham, Nene and Welland Catchment Flood Management Plans, it has been assumed that 849 properties were at risk of a 1 in 100 year flooding event in 2009, and that this figure will rise to 1,282 by 2100¹⁷. We have assumed that the number of at risk properties will increase in a linear manner between these two dates (table 4.5).

Table 4.5: Number of Properties at Risk of Flooding in Waterway Catchment Sub-Areas Along B2PWC Route

Catchment Flood Management Plan Area	Sub-Area	Number of Properties Currently at Risk	Number at Risk in 2100
River Nene	Peterborough (South) & Nene Washes	165	280
River Witham	The Fens (south)	502	619
River Welland	Fenland (north)	27	168
River Welland	Peterborough (North)	116	176
River Welland	Spalding	0	0
River Welland	Surfleet	39	39
Total		849	1,282
Number of properties experiencing flooding each year		8.49	12.82

Source: Environment Agency Witham, Nene and Welland Catchment Flood Management Plans

- 4.6.2 Based on data from the Association of British Insurers (as quote in a report by the Environment Agency), we have assumed that each damaged property will potentially result in

¹⁶ In the present value impact calculation, it is assumed that this impact will be spread evenly across the first 10 years of the appraisal period

¹⁷ See section 2.1 for a breakdown of how these figures have been calculated.

a £53,564 insurance claim (2020 prices). Based on this, we estimate a total average flood damage claim of £482,796 along the course of the route in 2020, rising to £686,692 in 2100.

- 4.6.3 We have based our modelling on an indicative assumption that the proposed improvements will mitigate 10% of these costs. We have assumed that it will do this by creating new channel capacity and local wetland corridor reservoirs, by increasing the capacity of existing channels, by facilitating flood relief in high rainfall events from existing highland carriers into the wetland corridor channels and reservoirs, and by restoring water levels to pre drainage status (e.g. at Flag Fen). (Table 4.6).

Table 4.6: Flood Risk Mitigation Impacts

	2009	2020	2049	2100	Source
A. Number of Properties at risk of a 1 in 100 Year Flooding Event	849	901	1,044	1,282	Environment Agency *
B. Estimated Number of Damaged Properties	8.5	9.0	10.4	12.8	= A / 100
C. Average Flood Damage Claim Per Household	£53,564	£53,564	£53,564	£53,564	Stantec, based on Environment Agency data **
D. Total Value of Flood Damage Claims (£m)	£454,760	£482,796	£559,257	£686,692	= B x C
E. Assumed Impact Factor	10%	10%	10%	10%	Stantec assumption
F. Assumed Saving	£45,476	£48,280	£55,926	£68,669	= D x E

* Based on the aggregate figure for each of the sub-regions in the Witham, Nene and Welland Catchment Flood Management Plans

** Based on figure quoted in 'estimating the economic costs of the 2015 to 2016 winter floods' (which this report attributed to the Association of British Insurers), inflated to 2020 prices

Source: Stantec 2020

4.7 Key Impact Findings

- 4.7.1 Applying a 3.5% discount rate to these figures, and aggregating the impacts over a 30-year appraisal period produces the following results (Table 4.7).

Table 4.7: Key Impact Findings

Impact type	30-year impact (£m, PV)
Construction & Maintenance	44.7
Tourism	50.3
Health	7.8
Land Value Uplift	6.2
Flood Risk Mitigation	1.1
Total	110.1
Cost	30-year cost (£m, PV)
Total project cost	72.9
Benefit-Cost Ratio	1.51

- 4.7.2 It shows that, over the course of the appraisal period, B2PWC will bring £110.1 million of benefits to the local economy at a cost of £72.9 million, equivalent to a benefit-cost ratio of £1.51 per £1.00 of total investment.
- 4.7.3 The project is likely to benefit several private sector organisations, including farm owners, property developers, and the developers of the South Lincolnshire Reservoir. It should therefore be possible to cover some of the costs of the project via private sector co-funding. This will help to increase the benefits cost ratio of the project from a public sector perspective. For example, if 50% of project funds could be secured through private sector co-funding sources, then the total benefit per £1.00 of public investment would be £3.02.

5 Conclusions & Next Steps

5.1.1 The analysis has demonstrated a strong strategic and economic case can be made for the Boston to Peterborough Wetland Corridor, generating the following economic impacts (Table 5.1):

Table 5.1: Key Impact Findings

Benefit / Cost	Value
Total Project Benefits (PV, £m)	110.1
Total Project Cost (PV, £m)	72.9
Assumed Public Sector Cost Share	50%
Total Public Sector Cost (PV, £m)	36.5
Benefit-Cost Ratio	3.02

Source: Stantec, 2020. All figures discounted by 3.5% per annum over 30 years

5.1.2 To strengthen the case, further considerations should be given to the following areas:

- **Capital funding:** this business case should serve as a starting point for discussions around how the project could be funded
- **Financial sustainability:** further evidence should be gathered to quantify the potential commercial income streams that B2PWC could generate for the project partners and to confirm whether these are sufficient to cover the £57,540 per annum maintenance costs of the project.
- **Governance and management:** clarity will be needed over who will be responsible for project development and delivery, and for day-to-day management of the infrastructure once built. Protocols will need to be put in place for sharing information
- **Delivery timescales:** project delivery timescales need to be defined in greater detail
- **Procurement and project control arrangements:** following governance and management considerations, the procurement mechanism will need to be defined.
- **Monitoring & evaluation:** a set of key performance metrics need to be agreed, and a set of procedures and timetables put in place for project monitoring and evaluation activities

5.1.3 Further detail would be beneficial in two areas:

- **Potential cost savings:** while this research has included a desk-based assessment to identify potential cost savings along the B2PWC route, a more detailed analysis including site surveys could identify further cost saving opportunities
- **Environmental impact:** during consultations with Natural England, a number of areas where further information might help the organisation lend its support were identified, including better understanding and mitigating the risks around invasive and non-native species. An environmental impact report will help provide this evidence

Appendix A List of Consultation Participants

The Stantec research team wish to thank the following individuals, who all supported us in the preparation of this business case.

Name	Organisation
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Chris Howes	Inland Waterways Association
David Pullen	Inland Waterways Association
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Janet Nuttall	Natural England
Dave Anderson	Peterborough City Council
Nigel Burch	South Holland District Council
Gwyneth McMinn	Sustrans
Steve Moncaster	Water Resources East
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