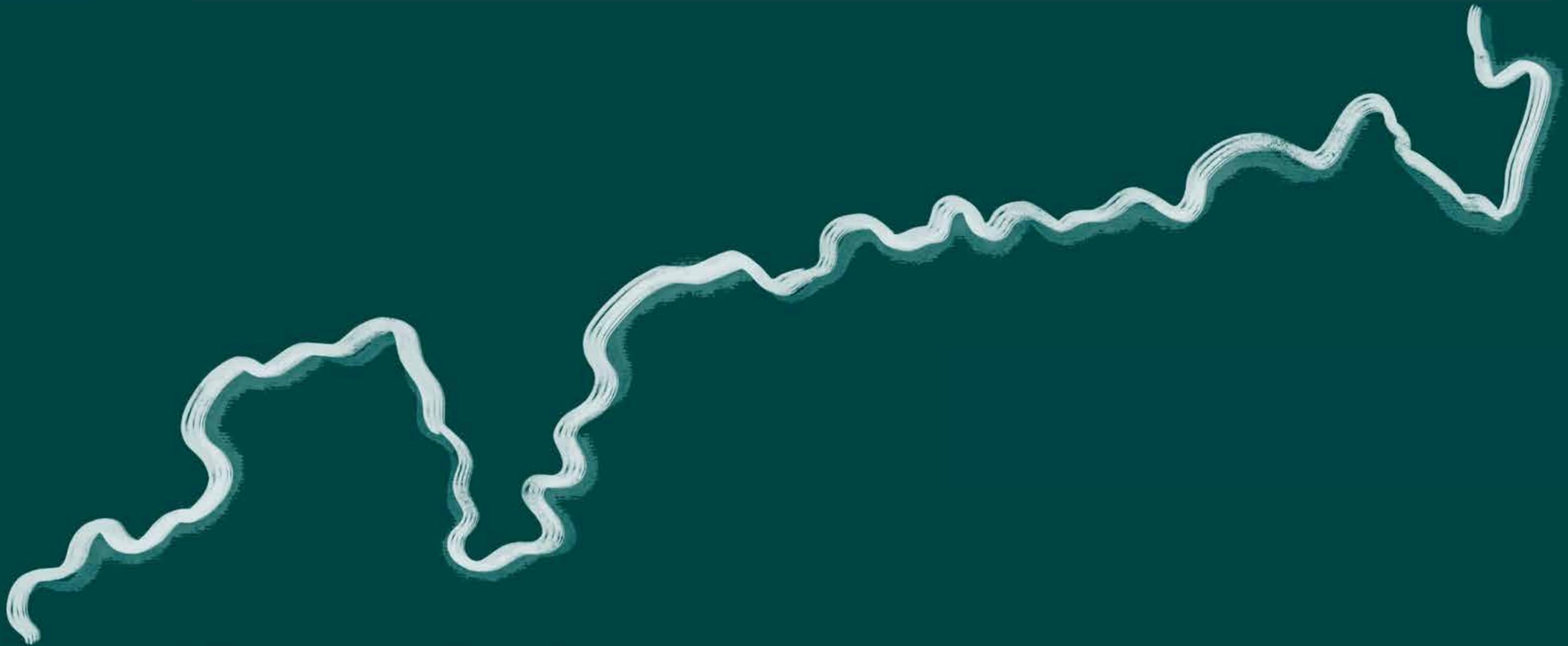


THE SUPER SLOW WAY

LINEAR PARK

Landscape Strategies Report

SEPTEMBER 2022



ACKNOWLEDGMENTS

This document has been written, designed and produced by BDP with the assistance of the Super Slow Way, Canal & River Trust, Arts Council England, Stakeholders and Gardiner and Theobald.

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1

The Super Slow Way
Linear Park
Landscape Strategies
Introduction

1.0 INTRODUCTION

1.1 Landscape Strategies

The Super Slow Way Linear Park aims to transform the Leeds & Liverpool Canal corridor in East Lancashire into a green, vibrant and healthy destination where communities can thrive.

This vital new, environmentally sustainable, locally driven asset represents an ever-present pulse for its towns and the people who live and work there. To create this new life on the Super Slow Way, these landscape strategies imagine an exemplar, world class post-industrial, natural linear park destination to excite visitors and residents with innovative lighting links through intuitive and connected landscapes, that replenish and enhance the precious green and blue spaces of this great waterway.

This invitation manifests itself in many ways. Focusing on convenient and enjoyable green routes that connect streets and communities to the canal side; the cross movement to and from the canal and its surrounding places; and new crossing points and bridges facilitating interaction between both sides of the canal. Knitting together the fabric of communities and the ecosystem of this post-industrial corridor in this way can deliver huge rewards.

With these aspirations in mind, the vision is clear – to provide opportunities for life, in all its rich and diverse forms, and the means to connect people with it.



The Super Slow Way as a destination



Northlight in the foreground and the Brierfield Gasholder in the background, Pendle

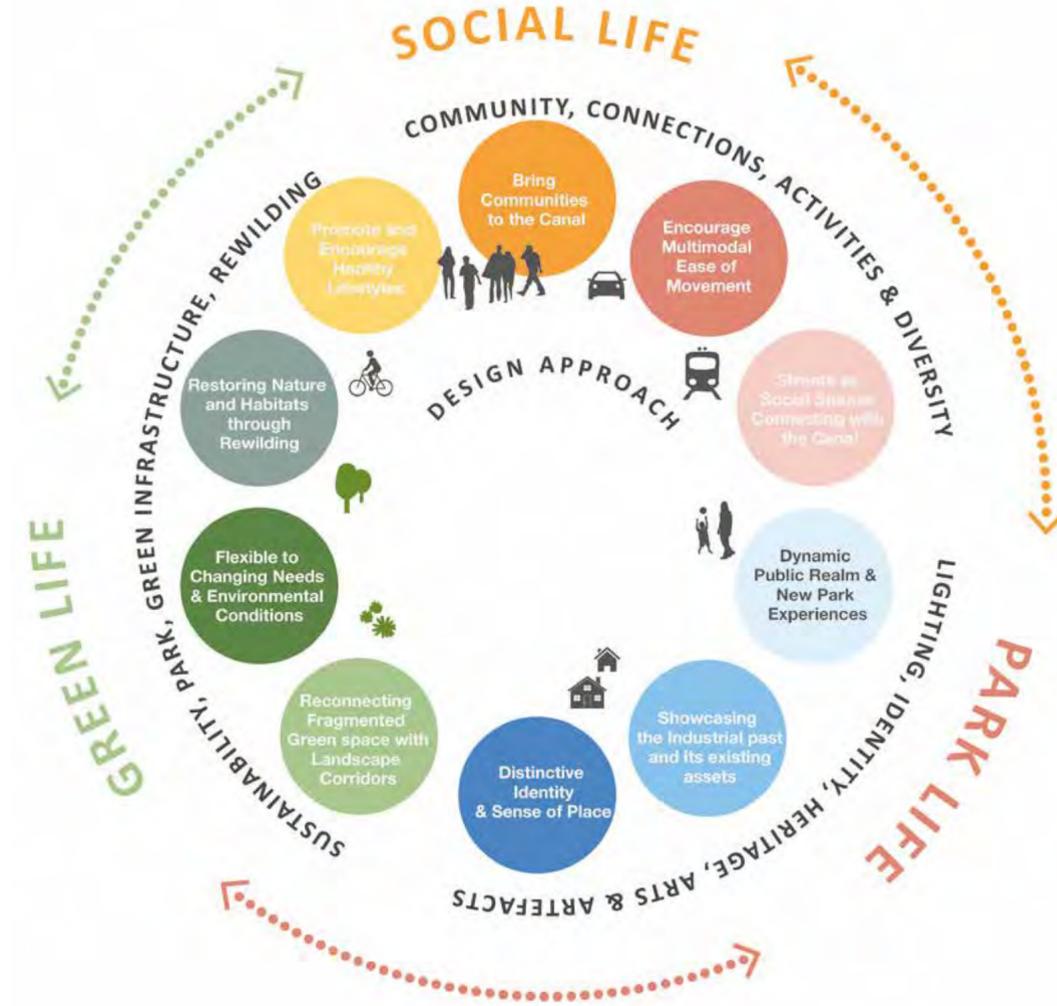




2

The Super Slow Way Linear Park The Landscape Strategies

These strategies propose a vision for a world class, post-industrial landscape park, balancing the urban environment and the natural world with people's needs



Greening, Wayfinding and Lighting strategies emerge from three key 'life' streams that embody the spirit of the Super Slow Way Linear Park

GREEN LIFE

A Linear Landscape Park
A Healthy Pace - Ecological
Habitat and Nature

SOCIAL LIFE

Connections and Wayfinding
Choreographed Spaces
Canal Journeys

PARK LIFE

Lighting the Super Slow Way
Heritage Icon Projects
Episodic Destinations

Photo: Light Cycles by Moment Factory, Illuminate Adelaide 2022. Credit: Tyr Liang & Xplorer Studio

GREEN LIFE



Key aspects of the Green Life Strategy are:

- *Cultivate attractive and resilient streets and green space with diverse planting to support flora and fauna.*
- *Promote productive landscapes including edible woodland gardens and community orchards.*
- *Restore wild hedgerows, create living walls, floating landscapes and natural linear habitats to promote biodiversity net gain.*
- *Celebrate seasonal colour, texture and diversity found in the plants that also reflect local culture, forms and patterns.*



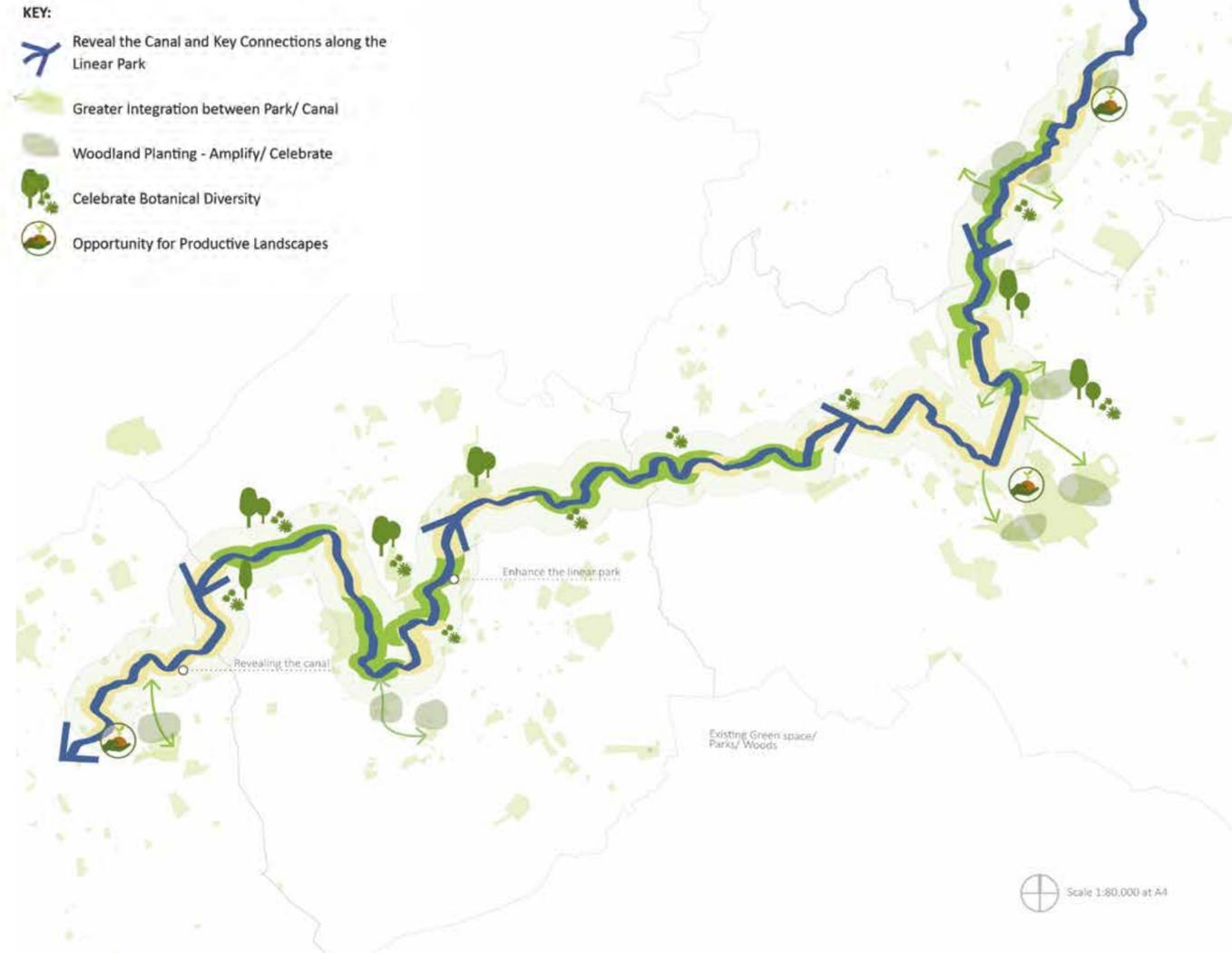
Duisburg Nord: © Christa Panick, Latz and Partners



2.1 A Linear Landscape Park

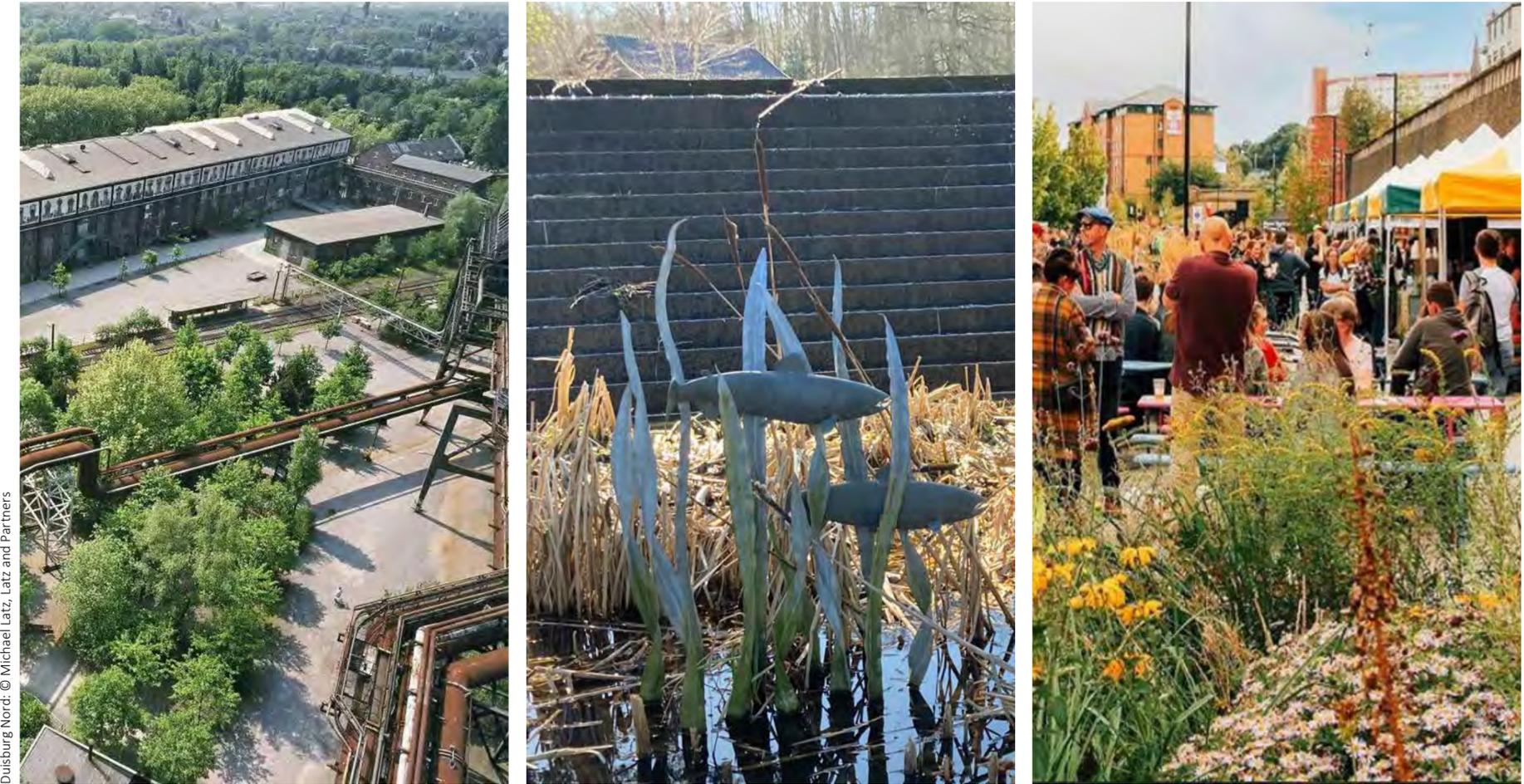
Revealing the canal as the key organising and connecting element of the linear park. Providing greater integration between the park and canal systems that supports and strengthens the landscape strategy. Culture, texture and colour can be found in the close narrative between textiles, plants and flowers found in the natural world.

Maintaining the qualities of the canal and associated plantings of significance and noble trees. Amplify and celebrate the existing 'park like' qualities of the canal. Incorporate opportunities for productive landscape, cultural harvesting which support Super Slow Way values. Celebrate greater botanical diversity which contributes to the restoration of the linear park as a regional destination.



Linear Landscape Park diagram

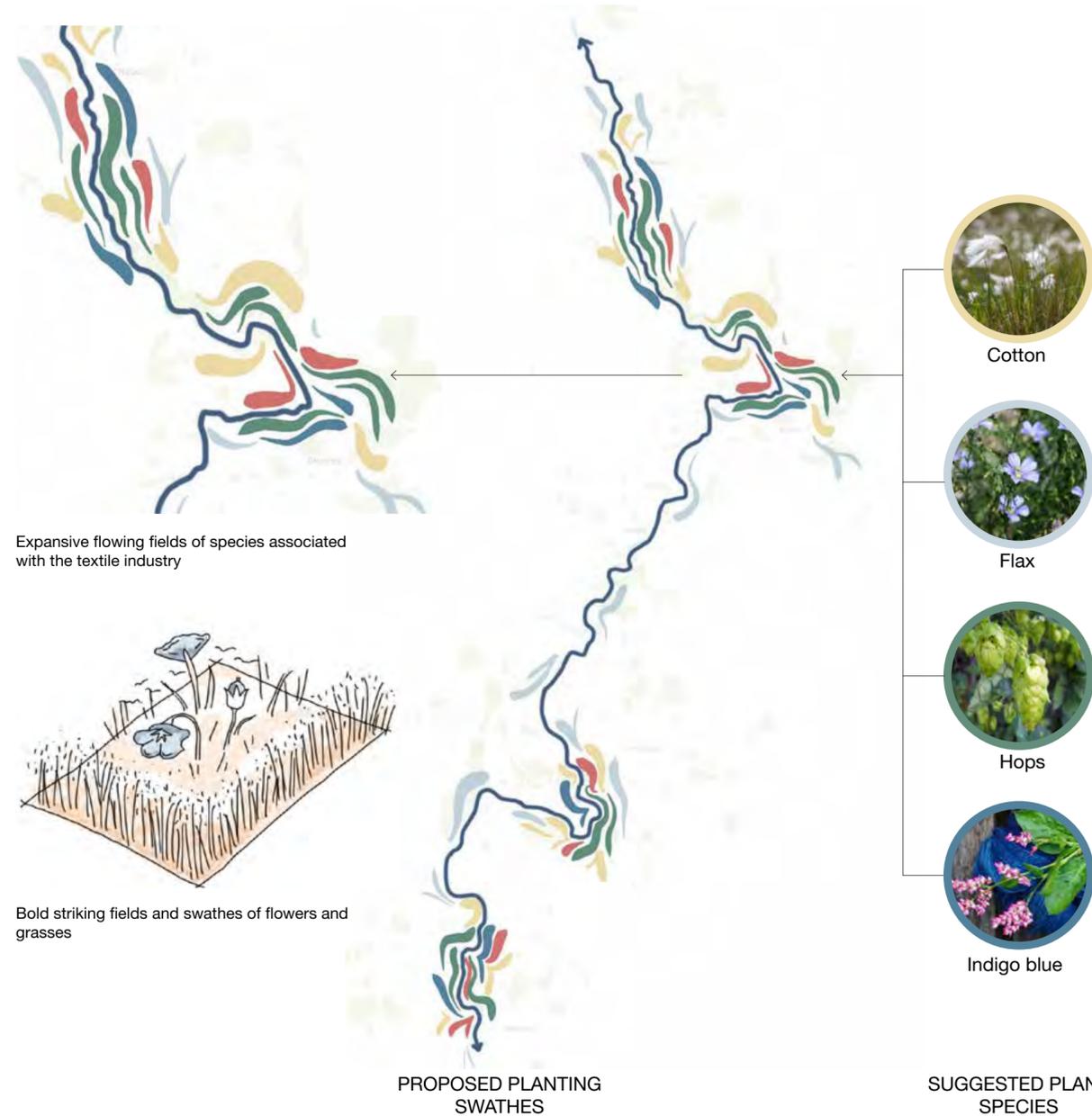
Renewing, restoring and re-animating



A waterway providing ecological, social and economic value

2.2 Planting Swathes

Large scale planting swathes punctuated along the canal edge will provide injections of colour and interest to the landscape. The planting swathes will follow the soft meandering flow of the canal turns and create eye catching features from the adjacent motorway and access points. The planting swathes will be formed of species and planting colours which are relevant to the linear parks textile and industrial heritage, such as indigo blue, flax fields and cotton. To supplement the planting swathes other species such as native and non-native grasses and shrubs will add colour, varying height and texture to the planting. The planting framework will articulate the proposed structure of routes along the canal and provide spaces which extend beyond the limits of the canal to blend in with the surrounding neighbourhoods.



Injecting colour to the landscape



Ruhrfisch, CC BY-SA 4.0, via Wikimedia Commons

A network of strong colourful planting swathes - connecting people with the canal and acting as a strong visual cue

2.3 Creating a Green Economy

Green tendrils that facilitate water management systems and allow people movement to the canal provide a legible structure to the green open spaces surrounding the canal, having a dramatic impact on the liveability of the towns by:

- Providing space for community-based activity via parks and plazas
- Increasing the sense of wellbeing for people and reduce the impact of urban density
- Promoting sustainable transport methods such as walking and cycling
- Providing habitats for plants and animals
- Adding value to development through destinational impact and quality of life benefits

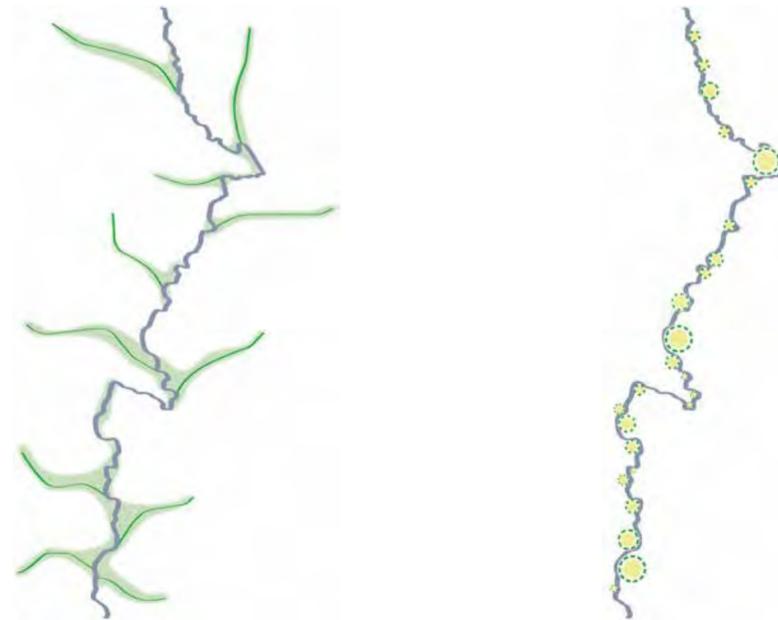
Carefully planned green space provides systems that address the key challenges facing our urban environments:

- Combating flooding, surface water runoff and water quality
- Improving air quality and reducing air pollution
- Reducing the urban heat island effect

The canal 'turns' have also been identified as providing opportunities for green infrastructure and pocket park opportunities. These 'turns' incorporate open space, pedestrian routes and nodal points with the canal.

'Healthy park, healthy people'

Green and Open Spaces



GREEN FINGERS

- Green corridors connecting people and nature to the canal
- Increased porosity reduces surface water runoff
- From green corridor to a network of parks, woodlands, meadows and green streets

CANAL 'TURNS'

- Natural green space opportunity on the 'turns'
- System of green spaces/ nodes along the towpath creates a rich mix of urban greens
- Pocket parks as green space access for local communities

Interconnected green corridors



Image of scheme: © Nigel Dunnett

Green fingers of naturalistic planting

2.4 Green Networks as Urban Connectors

Green spaces are the heart of the linear park. Rather than establishing a fixed hierarchy of parks, the proposed framework identifies a system of green streets linked to existing parks and green fingers that connect both sides of the canal corridor. The 'soft' framework articulates the proposed structure of routes and spaces that extend beyond the limits of the canal to blend in with the surrounding neighbourhoods.



EXISTING CANAL CORRIDOR

- Existing green and settlement areas along the canal.



GREEN FINGERS

- Green fingers connecting green spaces, parks, nature reserves and woods.



PROPOSED GREEN CONNECTIONS

Strengthened green connections



A network of green spaces, parks and gardens as a framework of sociable urban places

2.5 Step 1 - Green Fingers

A system of cross routes to improve connectivity across neighbourhoods and engagement with the canal connecting to existing green space, parks and gardens, water routes, town centres and multi-modal transport nodes.

These routes extend beyond the boundaries of the study area but are necessary components in approaching connectivity strategically to provide an expansive legible network.

Interventions that create these green fingers can range from large-scale redevelopment to minor interventions in existing streets. The result will be a consistent and recognisable green presence along these routes.



STEP 1 - GREEN FINGERS

Green fingers



'Green Fingers' incorporating a range of interventions to integrate sustainable green strategies

2.6 Step 2 - Green Connections

Where opportunity arises, green fingers will connect to green connections that will expand the green infrastructure concept.

In general, the green connections open up towards the canal, providing a sense of destination, dynamic view corridors towards the canal frontage, space for common benefit with ecological community-based activities and most importantly, an invitation for people to come to the canal side.

At an ecological level these connections accommodate water management systems such as infiltration swales, biofiltration ponds and below-ground attenuation systems to improve water quality and reduce flooding.

Habitat creation further introduces life to the canal corridor and connect people with nature.

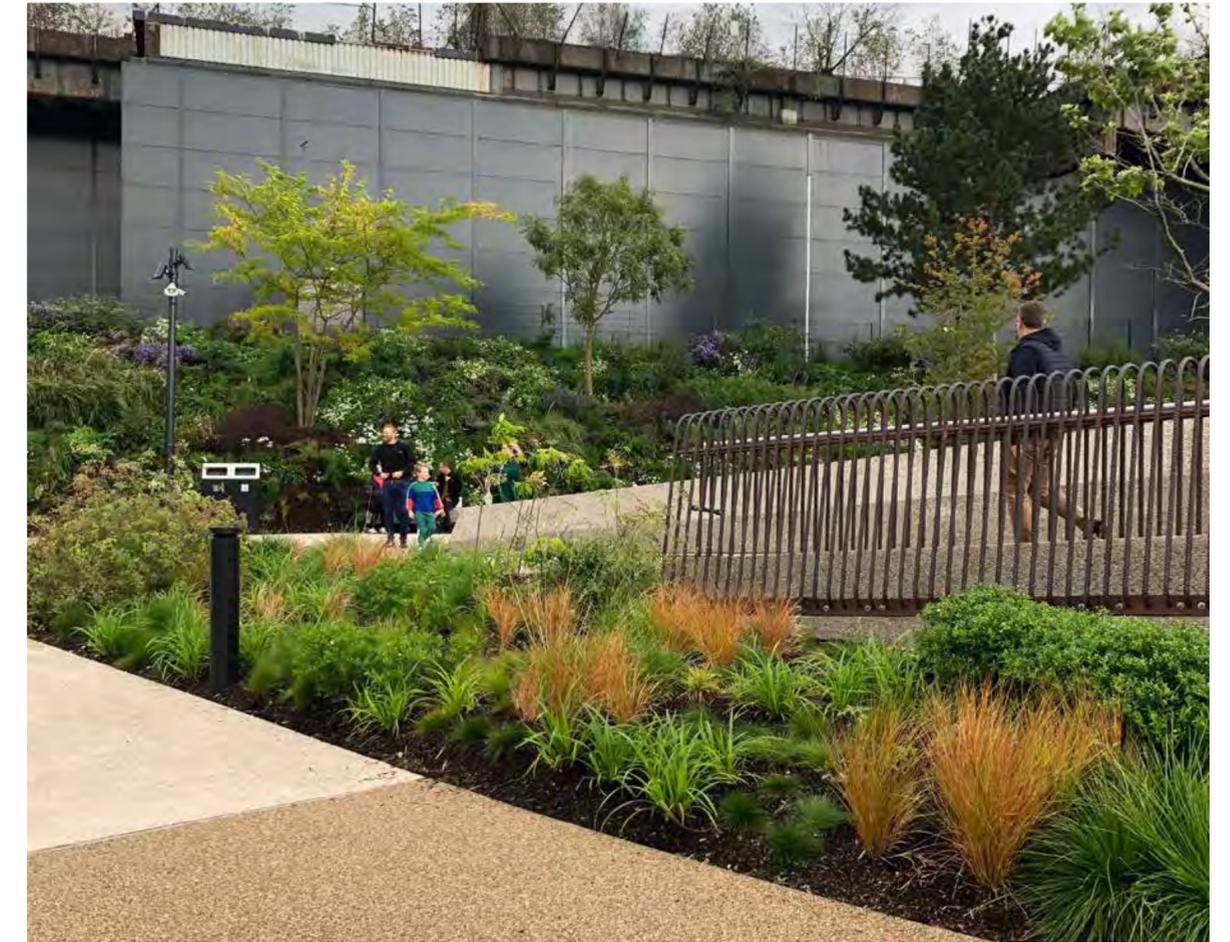
Socially these are spaces for communities to come together via plazas, boulevards, pedestrian links, cycling routes and parkland.



STEP 2 - PROPOSED GREEN CONNECTIONS



Green Connections



Green connections can provide a range of uses and opportunities for community life

2.7 A Healthy Pace - Ecological Health

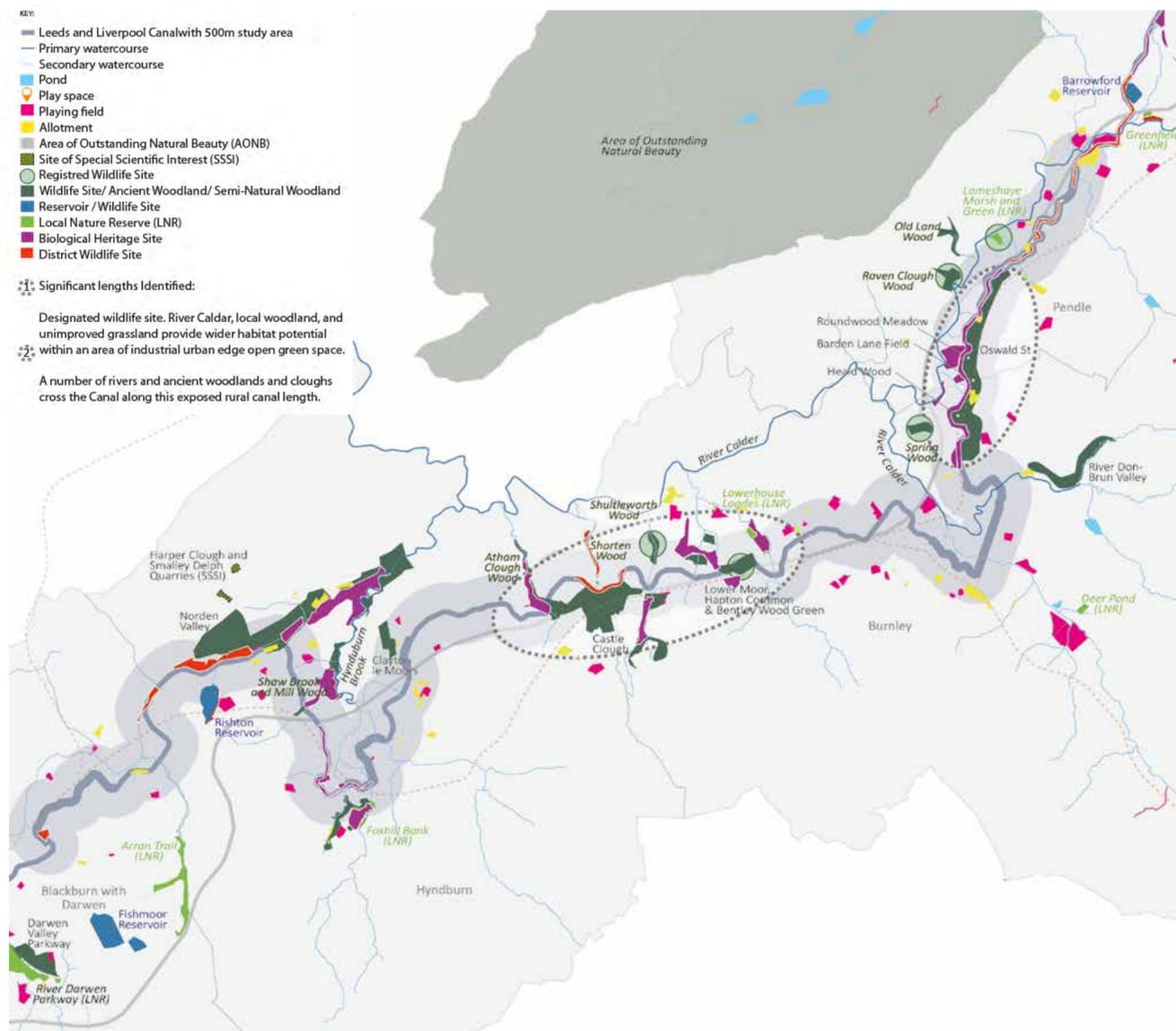
Enhancing the canal, surrounding landscape and towns with a new 'ecological aesthetic' which supports the ecology and habitat of the canal and adjoining river systems. Creation of a green corridor with a long term, sustainable critical mass of native habitat balanced within seasonal planting interest. Improved functioning of riparian and terrestrial ecosystems through the use of indigenous vegetation 'stepping stone' habitats along the canal.

The use of local provenance, native species strengthens the health of the local seed resource and reinforces the principle of right plant/right place. Indigenous vegetation is celebrated and the potential to become a sanctuary for native birds within the wider urban landscape is recognised.

Restoration of the canal's water quality, including the removal of excess silt levels. New constructed hard edges along the canal have in-built ecological benefits via overhangs, undercuts, in-water floating landscapes, eel holes and emergent vegetation.

Optimisation of eco-systems and introducing flourishing biodiversity benefits whilst minimising on-going maintenance costs. Restoring species rich hedgerows, filling gaps in hedgerows to support habitat corridors and reinstating damaged stone walls using artisan skills which have been lost to quick fix techniques.

The canal system created for the function of moving goods, now provides outstanding canal side scenery, waterborne and on-land recreational opportunities, and a wildlife habitat for animal and plant species in the local ecology.



Existing Green Infrastructure diagram

Ecology and Biodiversity



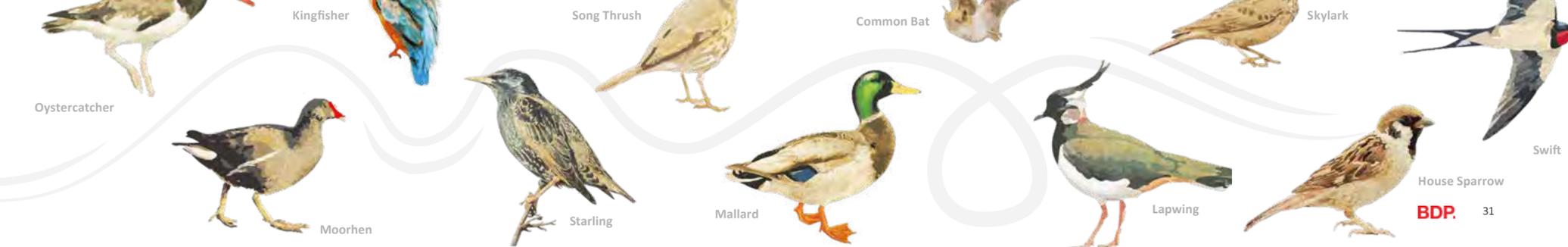
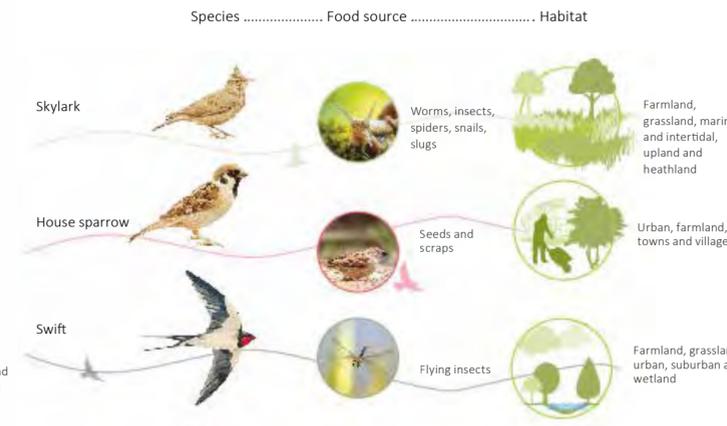
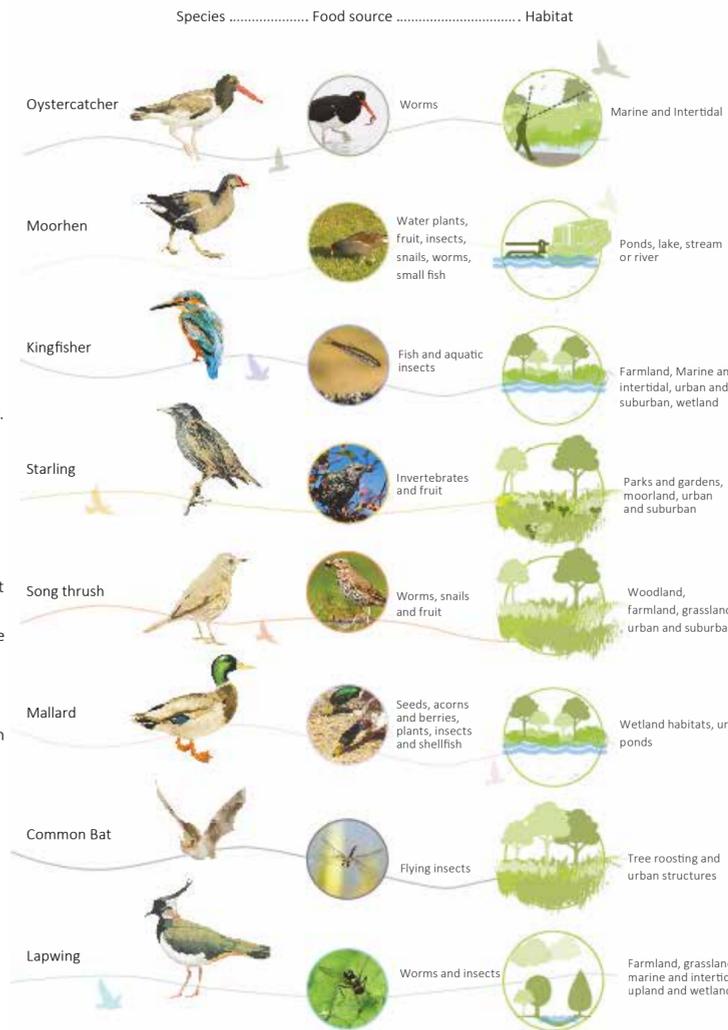
Integrating ecological solutions, biodiversity and habitat creation

2.8 Encouraging Birds and Bats

Along the length of the linear park there are a variety of notable bird and bat species, some of which are shown within the imagery on this page and are defined within the baseline report. Within the landscape adjacent to the canal and alongside it, there is huge potential to enhance the existing bird and bat population through the provision of additional thoughtful habitats and planting to encourage foraging and nesting. Simple features, such as planting for foraging and pollinating, bug towers, bird/ bat boxes within trees, meadow planting and viewing areas, will encourage wildlife and entice the local communities to visit the linear park.

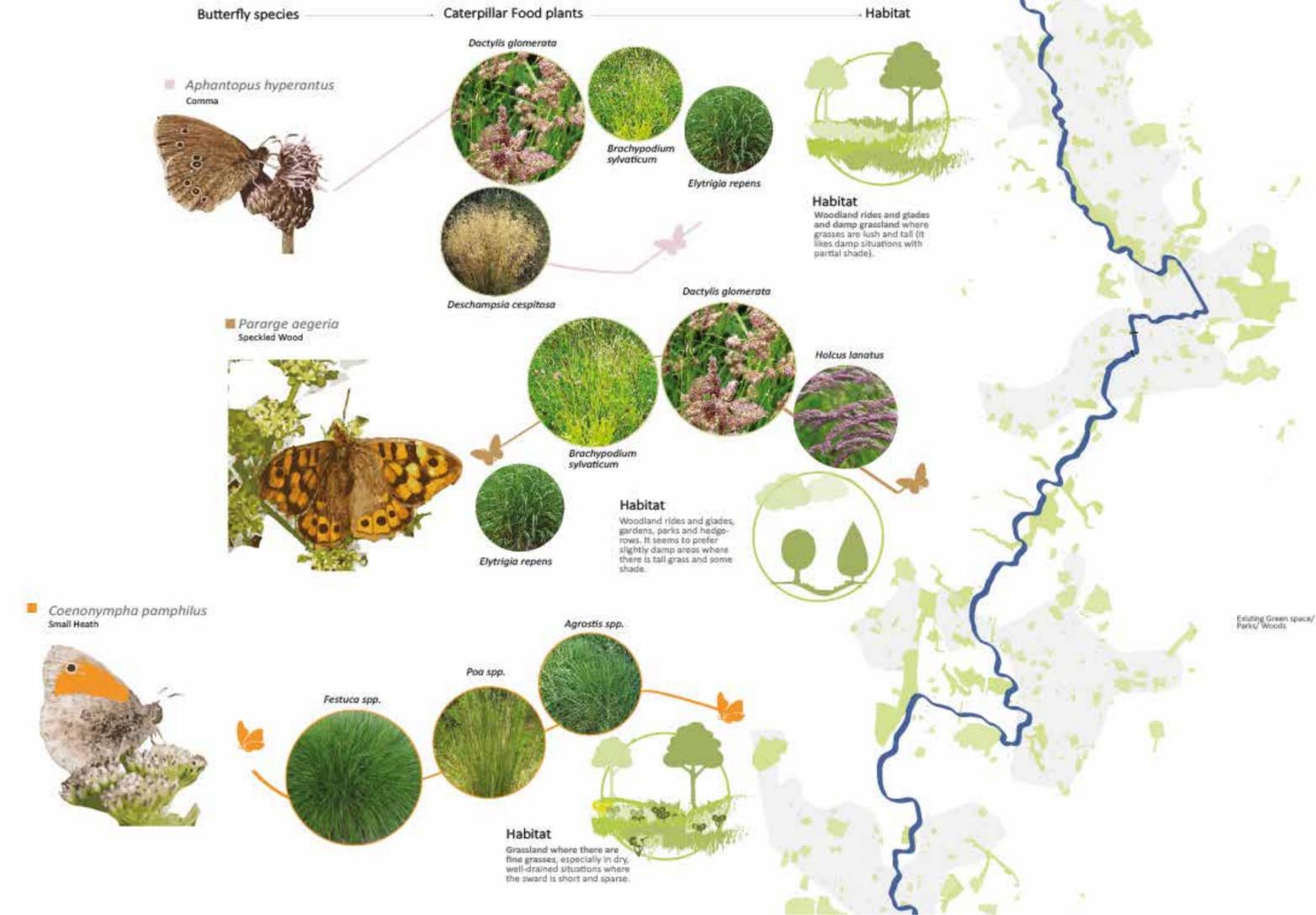
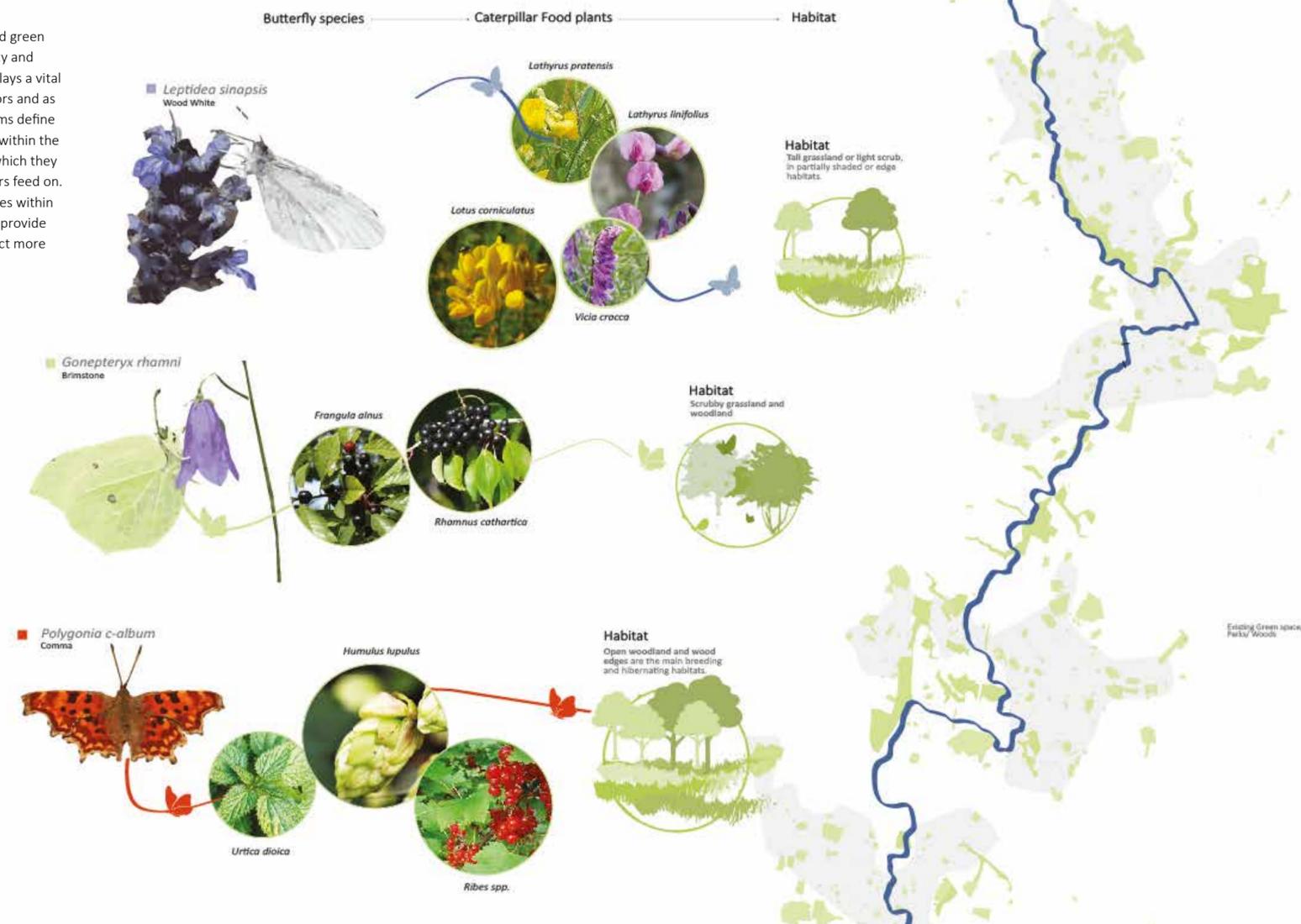
The bird and bat species shown within this and the adjacent page are present along the linear park. The Kingfisher is one of Britain's most beautiful and elusive birds and has been spotted along certain stretches of the Leeds & Liverpool Canal. The Kingfisher is a bright blue/ orange bird of slow moving or still water. They fly fast and low over water and hunt fish on riverside perches. They tend to create nests in vertical banks without much vegetation. Kingfishers are vulnerable to hard winters and habitat degradation through pollution/ unsympathetic management of water courses. They are listed as a Schedule 1 species under the Wildlife and Countryside Act 1981 which offers an additional protection. Providing habitat areas for Kingfishers and other species will help to increase the Kingfisher population and allow others to flourish.

The illustration on the adjacent page defines how the scheme within the Weavers Triangle area in Burnley could look through encouraging birds and pollinators to the green space.



2.9 Encouraging Insects

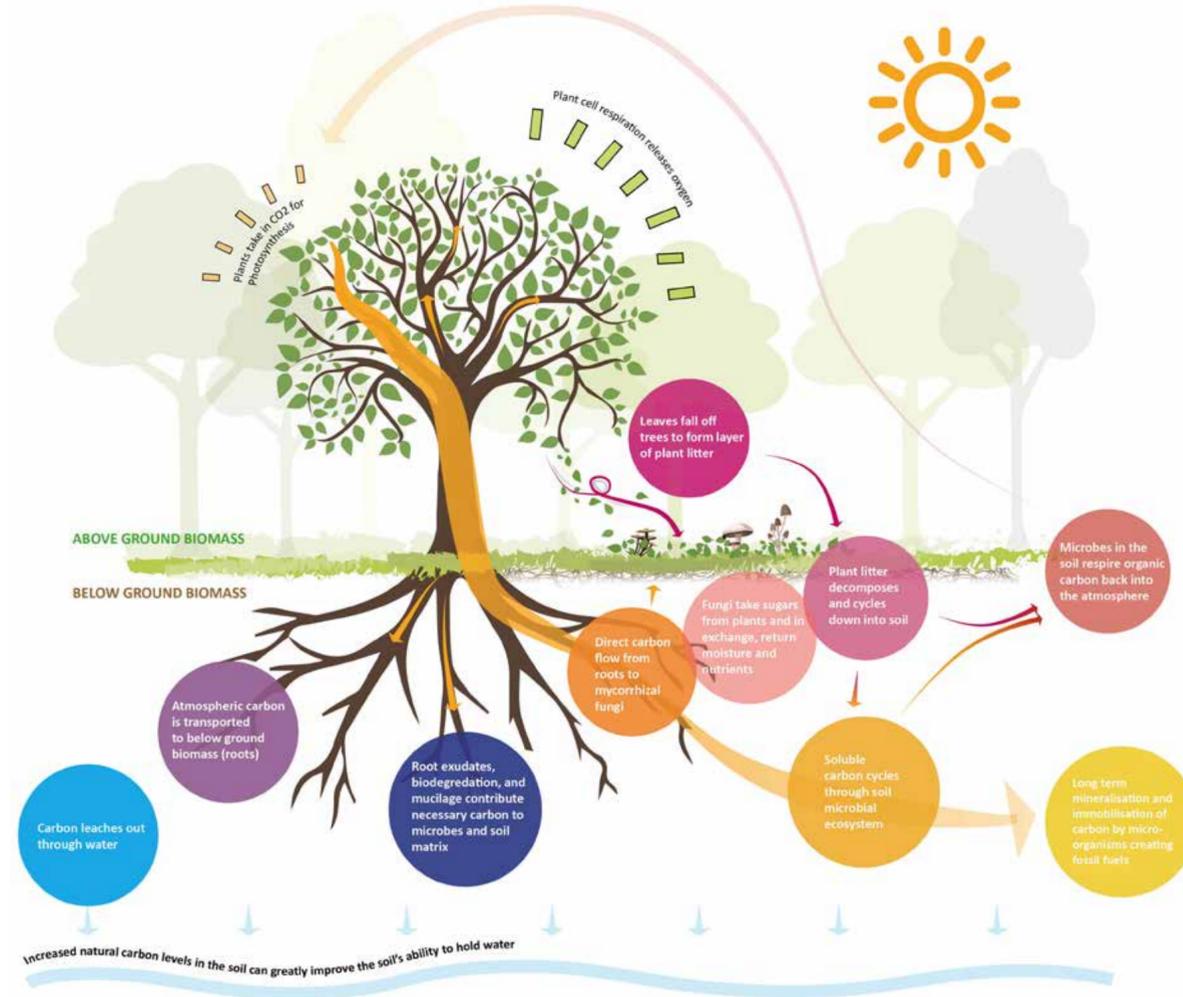
Within the linear park a series of pocket gardens and green spaces are being proposed to encourage biodiversity and visual interest. Planting within these green spaces plays a vital role providing colour and seasonal interest for visitors and as a food source for local wildlife. The adjacent diagrams define the prevalent butterfly species which can be found within the linear park and adjacent to the canal, the habitats which they thrive in and the planting species that the caterpillars feed on. Encouraging more of these habitats and plant species within the existing and proposed green spaces will help to provide habitats for the existing insect population and attract more pollinators and increase the numbers.



2.9.1 Sustainability

Enhance the canal, surrounding landscape and towns with a sustainable ethos which supports the ecology and habitat of the canal and adjoining river systems. The linear park must acknowledge and balance a complex set of heritage and ecological sensitivities. A circular resource efficiency must be applied to the landscape and built environment which focuses on re-use, retain, recycle, refurbish, reclaim and refit to help close the loop. The canal and adjoining areas must be resilient and consist of adaptive spaces which focus on water security, extreme heat, flooding and threats to native flora and fauna. Canal and water management, such as de-silting, improves water quality, the depth of water for activities such as boating and enables new flora and fauna to thrive. Richly planted reed beds, floating planters, wet woodlands, swales and ponds will enrich the green spaces and provide habitats.

The adjacent diagram refers to the carbon sequestration process of capturing and storing atmospheric carbon dioxide. It is one method of reducing the amount of carbon dioxide in the atmosphere with the goal of reducing global climate change. The diagram in particular focuses on the planting of trees, soil microbial ecosystem and the root fungal networks which store carbon.



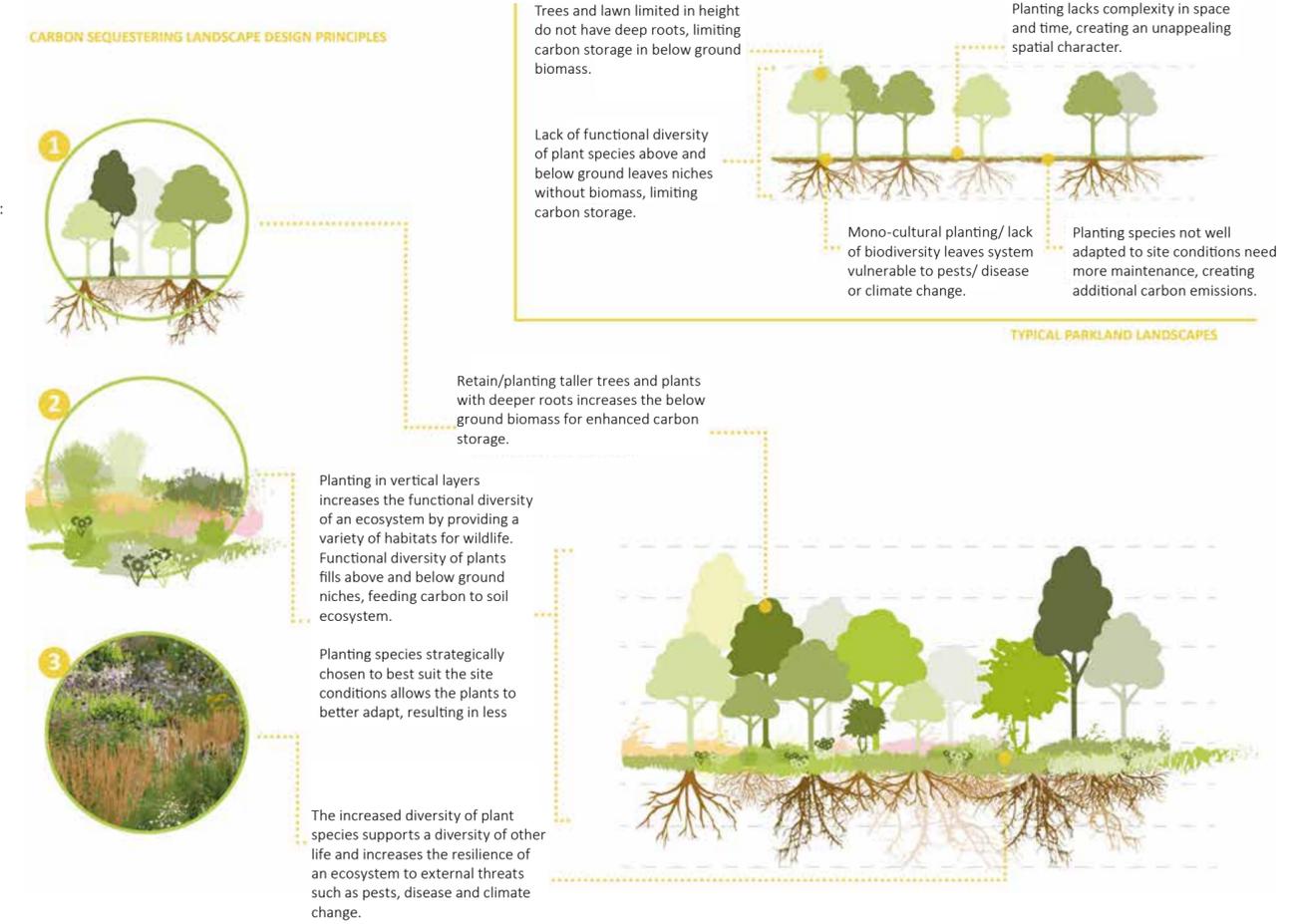
Carbon sequestration diagram

2.9.1 Landscape Toolkit

Within the linear park there are a series of principles which can be applied to enable the carbon sequestration process to take place. The adjacent smaller diagram, within the top corner of the page, highlights a typical landscape which provides some ecological benefits. The diagram below this reflects simple design principles which can be adopted within the linear park, such as additional trees and planted areas, which will enrich and enliven the green spaces.

A series of principles and concepts will be championed within the linear park to develop the existing landscape and enhance it ecologically and socially, as follows:

- Tree planting - plant new tree species which are genetically diverse mixes of woodland species. Ensure all trees planted are British sourced and grown. Additional tree planting will help to absorb carbon, cool the air and improve water management.
- Tree and planting areas - plant species which are drought and heat resilient.
- Cut and fill - existing landscape levels should be retained, wherever possible. Any cut and fill material should be kept and re-used/ recycled to prevent the requirement to take the material away.
- Encourage active travel - provide provisions for cycling along the linear park, catching a water taxi, scooting and walking.
- Biodiversity Net Gain (BNG) - improve and enhance the biodiversity value of the linear park.

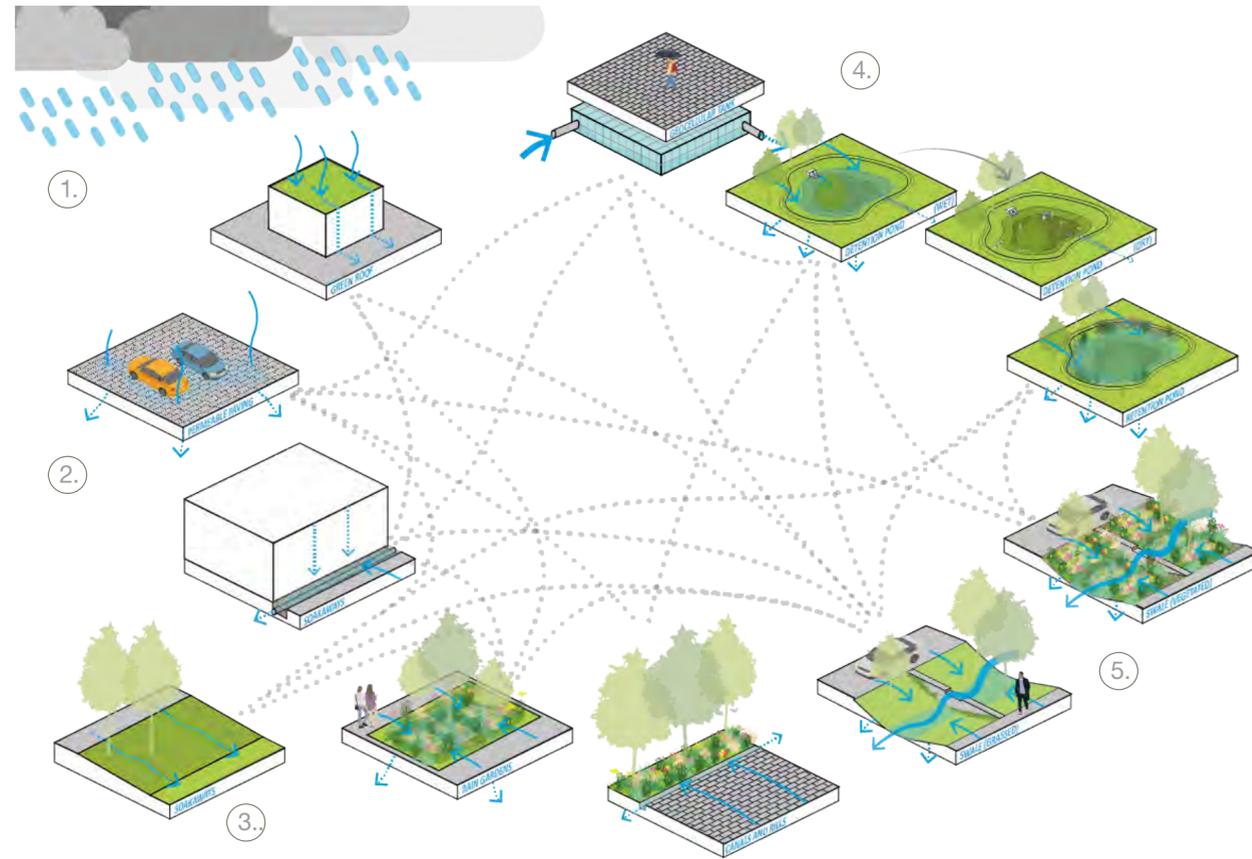


Carbon sequestration and landscape principles

2.9.2 Sustainable Urban Drainage Systems

Sustainable urban drainage systems (SuDS) are a series of practical ways in which water can be managed. Systems such as infiltration swales, bio-filtration ponds and below-ground attenuation systems help to improve water quality and reduce flooding. The diagram on this page highlights the ways in which the linear park can incorporate SuDS features within it. Locating retention ponds within the landscape adjacent to the canal is a simple and meaningful way of providing water storage and habitat, which could also be used as a way to top up the canal during dry spells.

1. **SOURCE CONTROL**
The inclusion of source control is the earliest, and one of the most important elements, in the sustainable drainage chain. Typical components will be located within the private properties or highway areas. Their purpose is to manage rainfall close to where it falls, not allowing it to become a problem elsewhere.
2. **FILTRATION**
One of the main treatment methods for sustainable drainage is filtration and removing sediment or other particles from surface water runoff. This can be achieved via the trapping of particulates within the soil or aggregate, on plants or on geo-textile layers within the construction.
3. **INFILTRATION**
Infiltration components are used to capture surface water runoff and allow it to infiltrate (soak) and filter through to the subsoil layer, before returning it to the water table below. Infiltration components can be incorporated into a range of SuDS components.
4. **RETENTION AND DETENTION**
These SuDS components are designed to either store water through retention, or attenuate through the detention of surface water runoff. Retention is primarily provided on the surface through ponds, and underground through geo-cellular tanks. Detention is useful in attenuating the peak flow from a rainfall event. These ponds operate optimally when flows are managed by other SuDS components upstream and used as a final stage in the removal of pollutants. Geo-cellular storage used on its own is unlikely to be regarded as a SuDS scheme, as it should incorporate source control.
5. **CONVEYANCE CHANNELS**
Conveyance channels transfer water across a site and between other SuDs. Vegetated channels (swales) or open surface water features with hard edges (canals and rills) provide sediment filtration and attenuation. Uncontrolled conveyance to a point of discharge into the environment is discouraged.



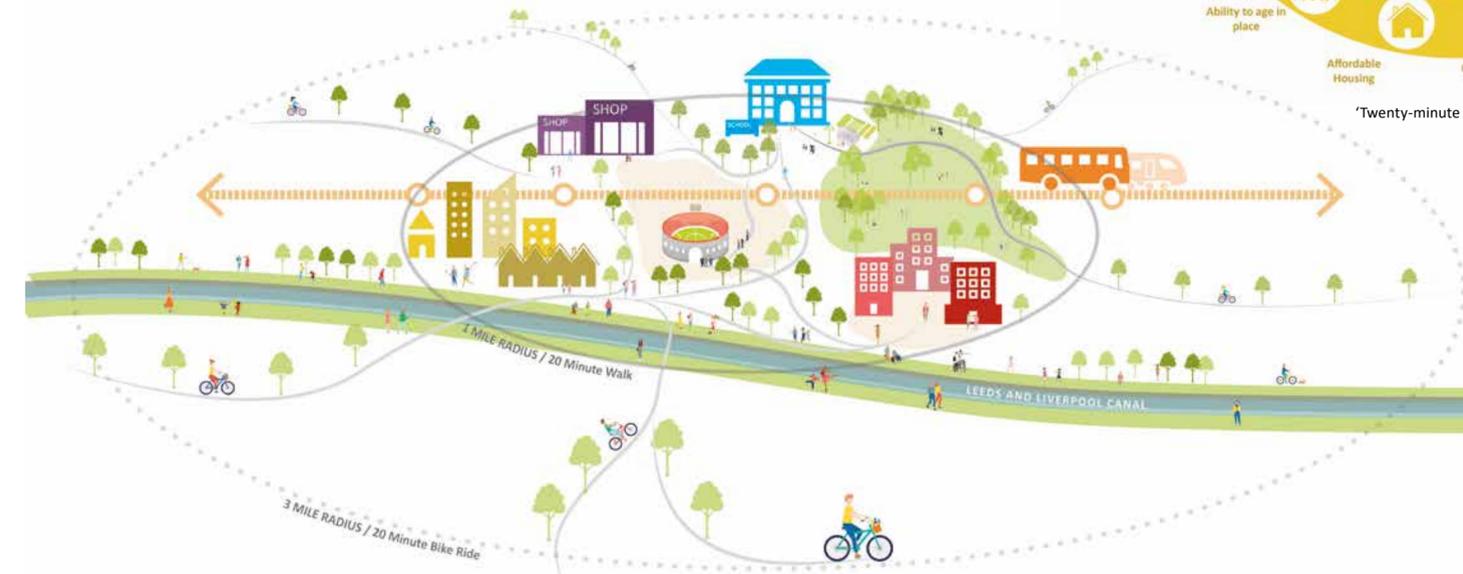
SuDS diagram defining the ways in which water can be captured and stored

2.9.3 Twenty-Minute Neighbourhood

The 'twenty-minute neighbourhood' idea has grown with interest throughout the world since the recent global impact of the COVID-19 pandemic and has highlighted the importance of the places where we live. The idea behind the 'twenty-minute neighbourhood' is that it provides a complete and compact neighbourhood which enables local communities to access amenities such as green space, schools, healthcare provision, shops and transport connections to name a few. The diagrams on this page highlight the key aspects of the 'twenty-minute neighbourhood' idea and reflect the amenities which they should strive to provide. The intention is that people can meet their everyday needs within a short walk or a twenty minute cycle ride from their homes and or local hubs. Multiple benefits can be derived from this idea and include boosting local economies, improving people's health and wellbeing, increasing social connections within communities and tackling climate change. Along the linear park a series of local hubs which already fulfil the 'twenty-minute neighbourhood' ideals have been highlighted within the icon diagram to the right, these hubs are located closely to local amenities and are within a short walk of the Leeds & Liverpool Canal green corridor.



'Twenty-minute neighbourhood' key amenity provision and local hubs



'Twenty-minute neighbourhood' ideals shown within a generic space along the linear park

SOCIAL LIFE



Key aspects of the Social Life Strategy are:

- *Connection through innovative wayfinding and information strategies to create seamless and intuitive ways to explore the linear park's green and blue routes.*
- *Encourage new visitors of all ages, providing opportunity for play, education and discovery.*
- *Promote social interaction, reducing anti-social behaviour and improving health and well-being.*



Madrid Rio: © Burgos and Garrido Arquitectos



Photo: Light Cycles by Moment Factory, Illuminate Adelaide 2022. Credit: Tyr Liang & Xplorer Studio



2.9.4 Wayfinding and Interpretation

Environmental graphic design embraces the visual aspects of wayfinding, communicating identity and information, and shaping a 'sense of place'.

Wayfinding is a series of interlinked decisions. Each decision affects the outcome of the next one. And the point at which a directional decision must be made – a decision point.

Some people have a natural sense of direction and a good memory for landmarks. Other people need to constantly study the wayfinding cues that are provided like signs and maps to feel comfortable.

Whatever the journey, finding the destination, then being successfully guided through the spaces has to be part of the whole brand experience. Wayfinding information controls movement and determines what people see and when they see it.

Effective wayfinding is essential in helping first-time visitors feel comfortable in unfamiliar surroundings and in encouraging them to return, and successful wayfinding strategies rely on clear, innovative signs and other wayfinding aids across all touch points to enhance the overall experience.

Signs are needed at key decision points for reassurance and confirmation. Well designed and sympathetically positioned signage can convey important information and guide navigation. However, these measures should be used sparingly as too many signs can confuse, disorientate, and create visual and physical clutter. Any design and positioning of new signing needs to take account of what existing signing can and can't be removed, including statutory signing.

The success of an environment relies on all environmental features working together to give the same wayfinding message, through an integrated design approach and holistic strategy.

Developing variations of established sign styles creates opportunities to reinforce the brand and enhance the consumer experience. If branded graphics or artworks are designed and positioned to also be 'waypoints' they can be both inspiring and functional.

Factors influencing the approach to wayfinding for the Super Slow Way

Key considerations to providing successful wayfinding in this location include:

- The extreme linear nature of the site. Having accessed the linear park, users will have a single directional decision to make: "Do I turn left or turn right?" Thereafter, everything they encounter will be in series and in the order they occur within the landscape.
- Visitors might use the site for access for a wide variety of reasons, each of which should be given equal billing with regards to information presented to the visitor. It would be undesirable to bombard the visitor with too much written information, therefore it would be the intention to utilise technology, via smartphones and an app, to enhance the visitor's experience and let them choose the level of information they require during their visit.
- Any hardware installed will need to be robust enough to withstand the rigours of vandalism and graffiti, especially given the 'off the beaten track' nature of where they might be positioned.
- Signing installed as part of this scheme will need to co-exist alongside some statutory signing and legacy signing (if it cannot be removed) belonging to other stakeholders



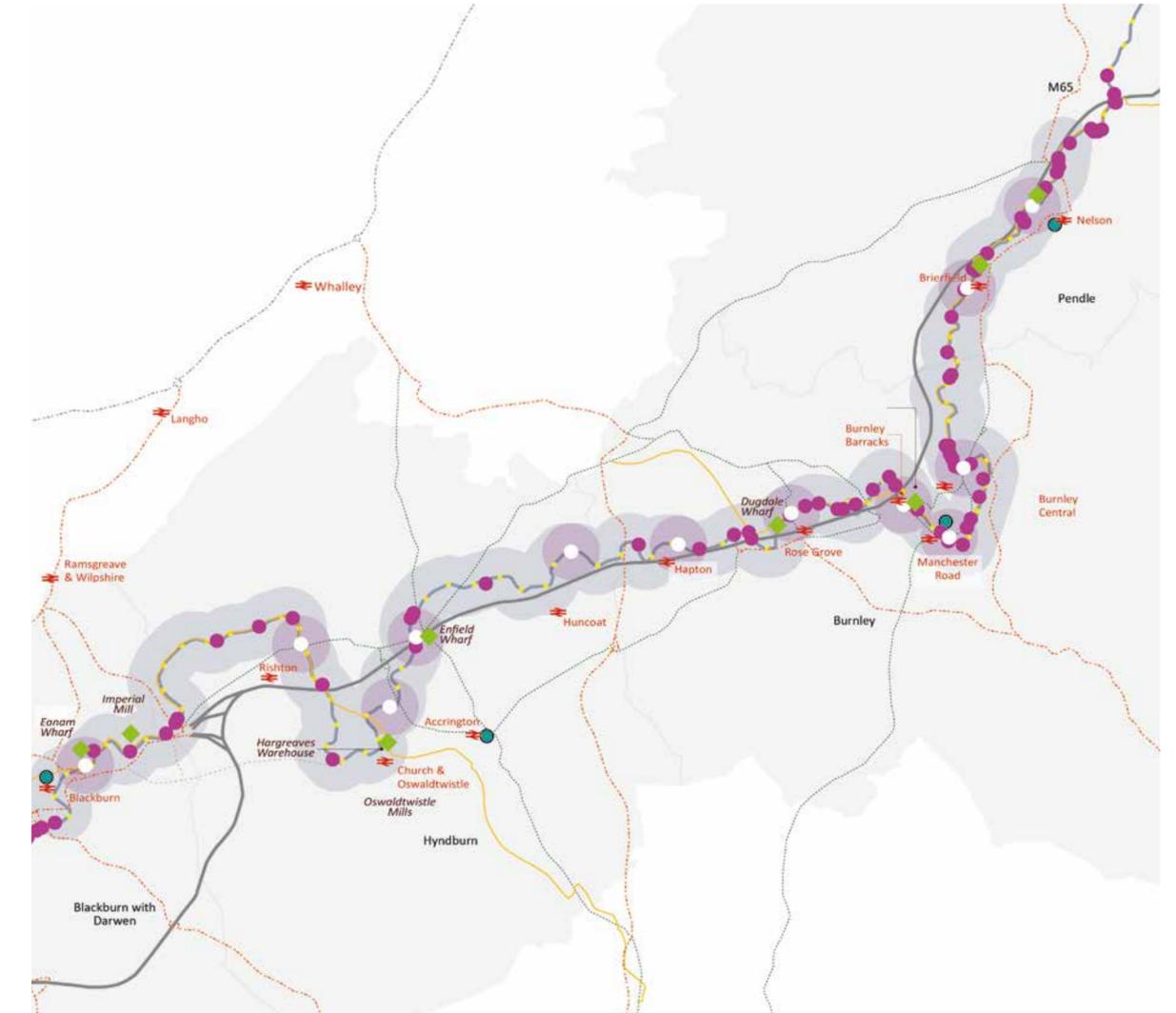
2.9.4 Wayfinding and Interpretation

Overview of general locations and sign types

A coherent wayfinding solution for the project involves the creation of four basic sign types located in the positions indicated on the map.

KEY:

- **Primary welcoming gateways/arrival points**
To be determined by proximity to transport infrastructure stations, traffic routes, car parks, cycle paths, significant pedestrian routes
- **Secondary gateways/arrival points**
All other widely accessible access points
- ◆ **Points of interest markers**
Signing relating to significant points of interest along the route
- **Existing historic mileposts**
Located at regular intervals along the canal side towpath



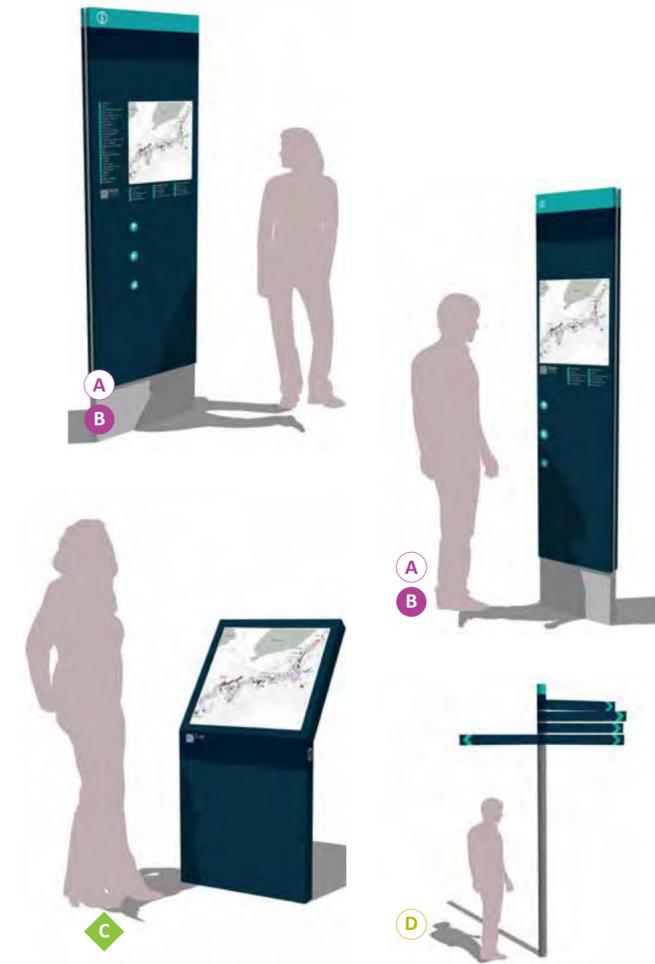
Positioning of wayfinding signage

SOCIAL LIFE

2.0 LANDSCAPE STRATEGIES

2.9.5 Connection and Wayfinding

Sign types at a glance



NOTE: The examples shown above are representative of an approach and do not convey final designs or materiality. This would be developed in accordance with brand and client aspiration.



Generic example of positioning wayfinding signage along the canal corridor

SOCIAL LIFE

2.9.5 Connection and Wayfinding

Combining real-world experience and digital interaction

Wayfinding and user experience of the site will be enhanced using a mix of real-world experiences and digital interaction with the app.

Part of the wayfinding strategy which will also serve as marketing collateral will be the production of printed versions of maps and guides.

This blend of on-site signing, printed media and digital content will provide context, background and guidance to enable the visitor to get the most out of the facility and encourage repeat visits.



Images from Website: Low Line

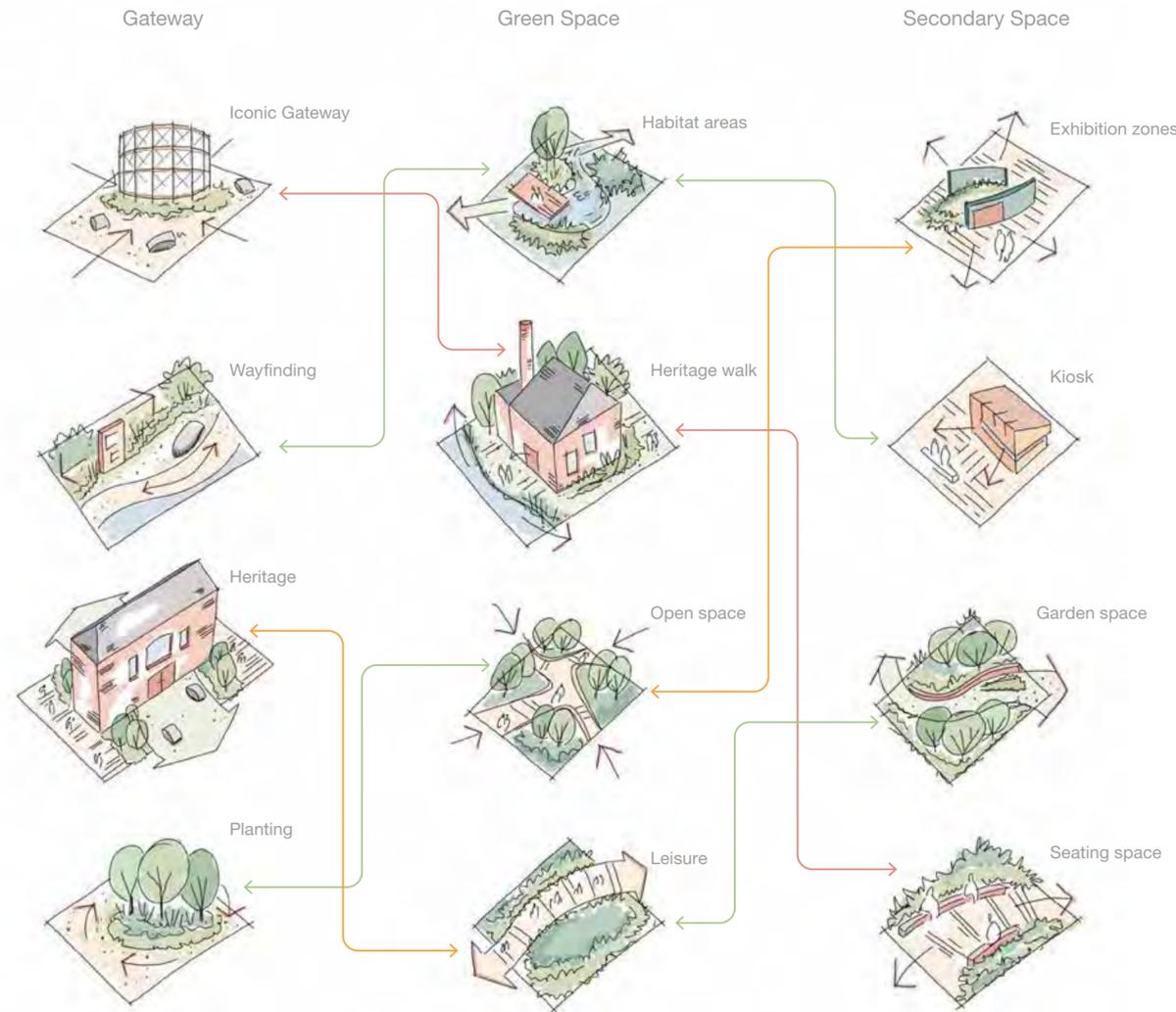
	Planning the visit	Arriving	Exploring/Navigating	Interpretation/Storytelling
Digital Technology	<ul style="list-style-type: none"> SSW website <ul style="list-style-type: none"> online identity online guide/itinerary Link to mobile data in app 	<ul style="list-style-type: none"> Mobile app – QR code Interact with maps (physical) 	<ul style="list-style-type: none"> Mobile app – route/trail data QR codes to physical maps 	<ul style="list-style-type: none"> SSW website – information Mobile app – augmented reality
Printed Work	<ul style="list-style-type: none"> SSW printed maps <ul style="list-style-type: none"> providing similar data to website 	<ul style="list-style-type: none"> Pick up free maps at destination points <ul style="list-style-type: none"> transport/landmarks/themed maps 	<ul style="list-style-type: none"> Maps to cover episodic destinations QR links to online information 	<ul style="list-style-type: none"> Themed maps Interpretation QR links on maps
Signage/Information Markers		<ul style="list-style-type: none"> Information points at arrival hubs etc. 	<ul style="list-style-type: none"> Design to identify quarters Primary/secondary markers 	<ul style="list-style-type: none"> Boards to interpret heritage/nature features etc. Themes
Signage/Information Markers		<ul style="list-style-type: none"> Feature artwork 	<ul style="list-style-type: none"> Light features <ul style="list-style-type: none"> projections Surface inlays etc Banners 	<ul style="list-style-type: none"> Artisan plaques Interpretation boards Banners

2.9.6 Canal Journeys

A wayfinding strategy will combine elements which provide directional information for pedestrians and cyclists with interpretation points and a range of interventions:

- Enhancing the other bank of the canal corridor where there is no towpath with interventions that enhance boundaries and showcase vertical facades.
- Providing shared space for walking and cycling within a balanced and fair approach.
- Establishing a network of urban connectors which circum-navigate the routes between transport hubs and the canal gateways.

Supporting in-water canal journeys through canal water taxis, the enhanced provision of water's edge access and other accessibility platforms. Providing new pedestrian and cycle bridges which support access and circulation across the canal between communities.



Landscape pocket spaces, showcasing heritage features and amenity uses

The network of schools, places of worship, and community centres provide the social infrastructure to support local routes and journeys that link the towns, parks and neighbourhoods to the canal



2.9.7 Choreographed Network of Spaces

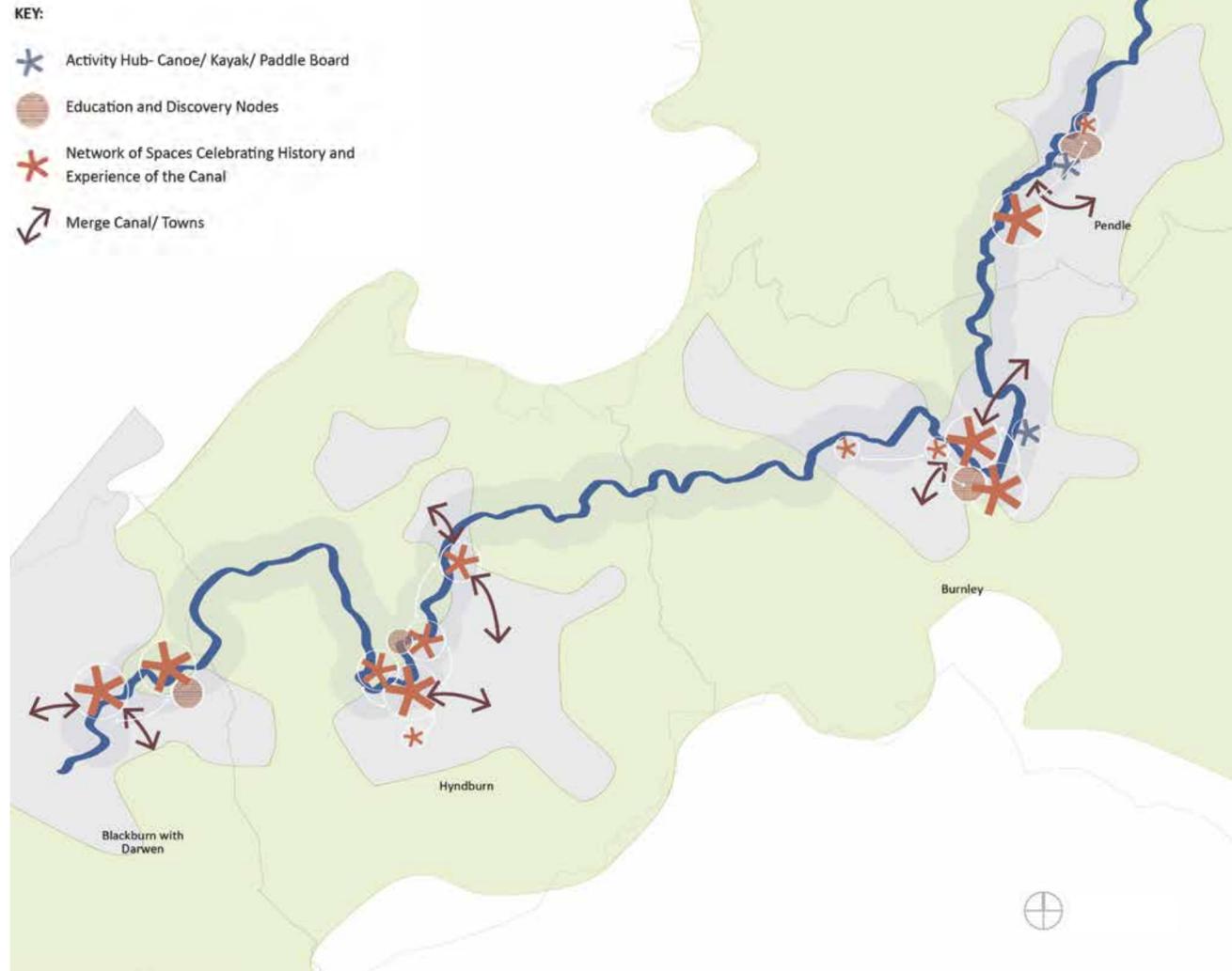
There is a network of spaces and an expanded set of walking routes that encourage wider circulation within the local centres, that support a wider network of townscape, heritage and cultural attractions, parks and gardens, and connections to surrounding residential neighbourhoods.

The landscape character, history, and identity of the canal corridor is enhanced through an expanded network of site specific design features and interventions. Highlighting existing and proposed canal bridges as landmarks and experiences that link the canal with the towns.

The canal corridor offers continuous pedestrian access and should be viewed as a key component of each settlement. A series of new and existing pedestrian bridge crossings and a variety of well-connected corridor spaces provide interest, activity, and offer a range of playful and recreational opportunities for people to enjoy.

Providing new opportunities to engage with the water at activity hubs such as canoe and paddle boarding, integrated through wayfinding, interpretation and play with opportunities for education and discovery.

There is also opportunity to provide space for gathering, celebration and place-making which support the linear park as the region's signature landscape experience and destination.



Locations of choreographed network of spaces

Providing opportunities for gathering, celebration and place-making which support the region's signature landscape experience and destination

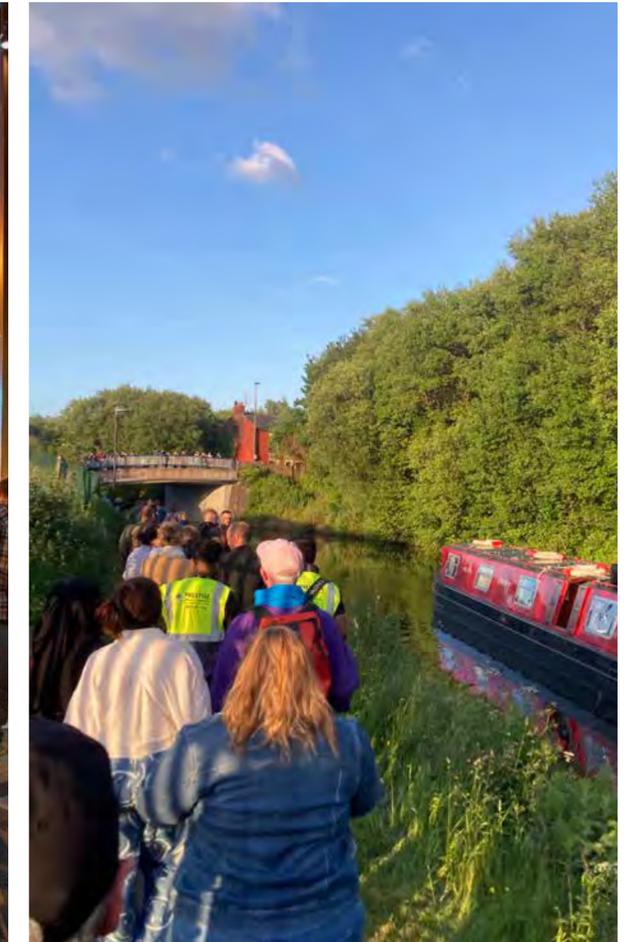
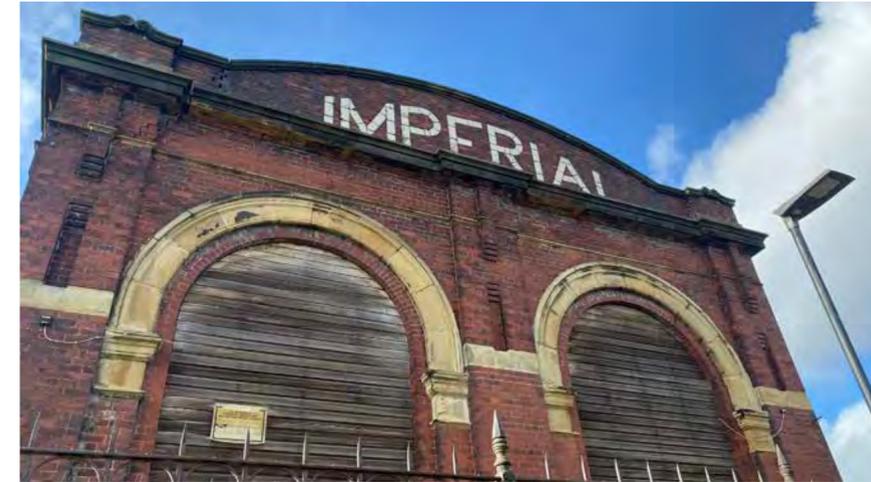




Photo: Light Cycles by Moment Factory, Illuminate Adelaide 2022. Credit: Tyr Liang & Xplorer Studio

Key aspects of the Park Life Strategy are:

- *Highlight the heritage and built form that connects the canal's past to its contemporary life.*
- *Illumination of key features such as, bridges, walls, paths steps to create variety, discovery and interest.*
- *Enhance the setting of landmarks to create drama and provide changes in mood and atmosphere.*
- *Arts programme to express culture including the transition of heritage legacies to future contemporary uses.*



Kgbo, CC BY-SA 4.0, via Wikimedia Commons



2.9.8 Heritage

The Super Slow Way linear park as a regional and signature tourist destination is gifted with a collection of highly visible industrial architectural landmarks, generous open parkland and a compelling history and heritage.

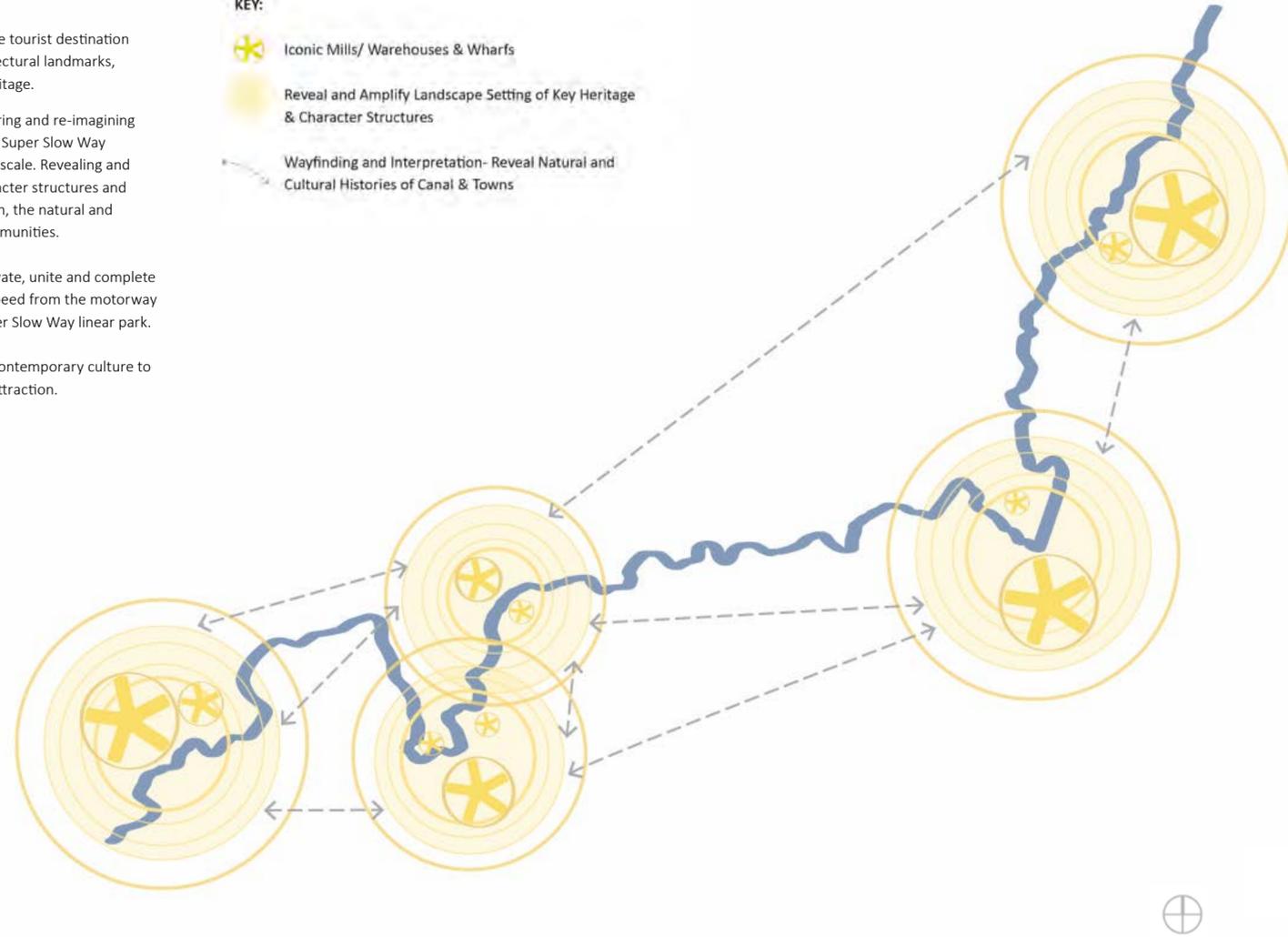
By building upon a holistic identity through lighting, restoring and re-imagining new uses for the iconic mills, warehouses and wharfs, the Super Slow Way can unify and showcase its qualities and assets at a grand scale. Revealing and amplifying the landscape setting of key heritage and character structures and buildings. Revealing through wayfinding and interpretation, the natural and cultural history and stories of the canal its towns and communities.

There is also a wonderful opportunity here to further elevate, unite and complete the visual story by interventions to capture attention at speed from the motorway and at a slow pace whilst on the canal and within the Super Slow Way linear park.

Together, the re-imagined industrial past combines with contemporary culture to deliver a holistic and complete, inspired destination and attraction.

KEY:

- Iconic Mills/ Warehouses & Wharfs
- Reveal and Amplify Landscape Setting of Key Heritage & Character Structures
- Wayfinding and Interpretation- Reveal Natural and Cultural Histories of Canal & Towns



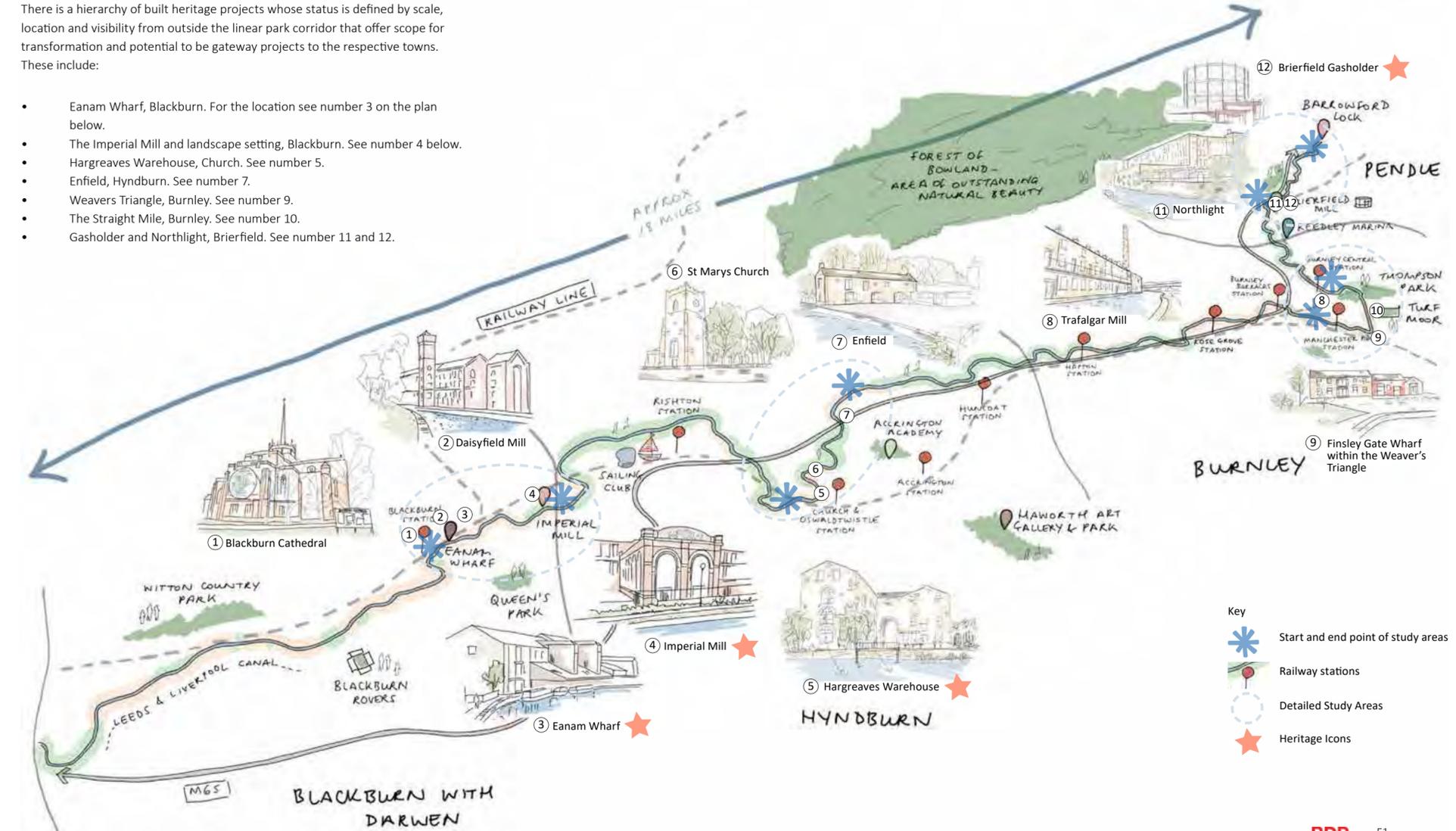
Scheme location within the wider administration district

Iconic mills, warehouses and wharfs interconnect the canal corridor

2.9.8 Heritage

There is a hierarchy of built heritage projects whose status is defined by scale, location and visibility from outside the linear park corridor that offer scope for transformation and potential to be gateway projects to the respective towns. These include:

- Eanam Wharf, Blackburn. For the location see number 3 on the plan below.
- The Imperial Mill and landscape setting, Blackburn. See number 4 below.
- Hargreaves Warehouse, Church. See number 5.
- Enfield, Hyndburn. See number 7.
- Weavers Triangle, Burnley. See number 9.
- The Straight Mile, Burnley. See number 10.
- Gasholder and Northlight, Brierfield. See number 11 and 12.

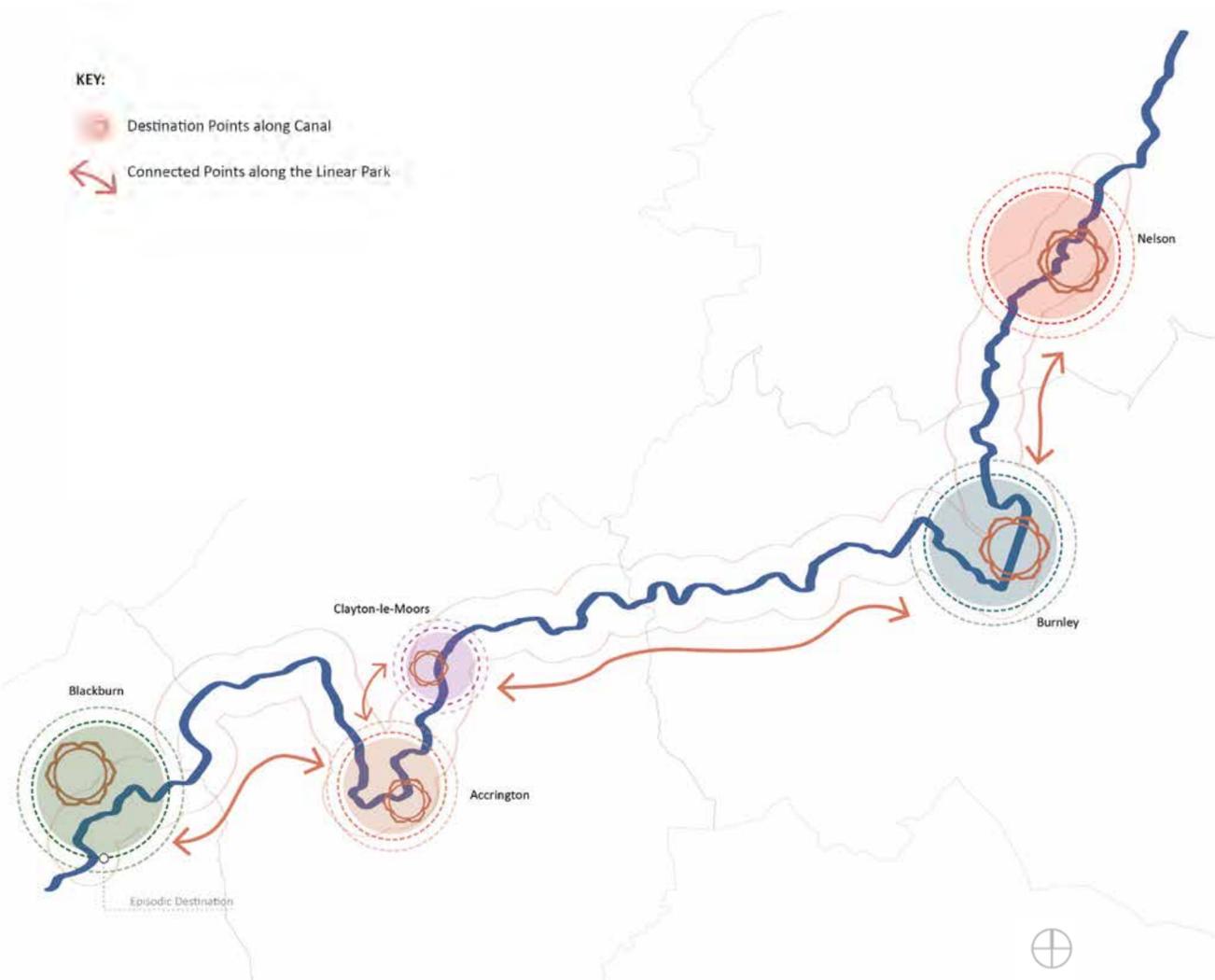


- Key
- Start and end point of study areas
 - Railway stations
 - Detailed Study Areas
 - Heritage Icons

2.9.9 Episodic Destinations

The strategy provides for a range of character precincts and destinations which support the proposed cluster of heritage icon projects and create memorable and diverse points of destination along the linear park. Area opportunities include:

- Opening up and enhancing the canal experience in Blackburn Town Centre, providing canal frontage that re-engages with the town; re-imagining Imperial Mill as a thriving hub for the creative industries.
- Developing Hargreaves Warehouse in Hyndburn as a unique heritage and cultural destination and central catalyst for wider improvements. Strengthening the arrival and access onto the canal, connecting short trip recreational trails to destinations such as the Coke Oven, and longer journeys across the Dunkenhalgh Parkland. Engaging with landowners to enhance the urban site edges with the canal and showcasing the world class businesses of William Blythe and Emerson and Renwick.
- Revitalizing Burnley's 'Weavers Triangle' as a learning and health destination, utilising links with UCLan, Finsley Gate Wharf, activity hubs for in-water activities along the Straight Mile, Thompson Park, river valleys and sporting venues. Multi-modal transport strategy linking the three railway stations and bus station to the canal forming a seamless 'loop' of walking and cycling routes with the town centre with the canal at the centre.
- Harnessing the assets of Northlight and Brierfield gasholder to become a central focus in a local-scale linear park (within the wider linear park) that showcases sustainability, heritage and play and also re-engages the community through projects such as food growing and sport. Linking up with the offer at the Leisure Box and the Steven Burke Sports Hub at Barrowford. This linear park is complimentary to the formal Victoria Park and also aspires to open up new links with Pendle Water.



Iconic destination points along the canal corridor

Super Slow Way destinations with their own unique character



Enhancing and connecting destination points

2.9.10 Lighting the Super Slow Way

The lights of the Super Slow Way at the grand scale, provide the identity, visual markers and reference points which can be seen when slowly travelling within the Super Slow Way linear park but equally important when viewed from beyond, in the surrounding hills or at high speed from the motorway. A coordinated approach to lighting the key structures, as well as more local features, will create a visual harmony and gallery that attracts attention and encourages the public to join the Super Slow Way and discover more.

Illumination of key features such as bridges, terraces and steps will create variety, discovery, drama and interest, and strengthen identity and scale. Variation to the lighting could also provide changes in mood and atmosphere.

A degree of lighting control enables variation during evenings and for special events. Supporting feature lighting focuses on character/landmark features.

The lighting seeks to provide a high level of safety and amenity whilst preserving the character and personality of the linear park corridor while respecting the contrasting needs of wildlife.

In the right light, at the right time, everything is extraordinary.
- Aaron Rose



Image: © Drax Group



We Love Lisbon, CC BY NC-ND 2.0, Flickr



Westferry Circus image: HALO by VENIVIDIMULTIPLY

2.9.11 Lighting Design Objectives

The core lighting design objectives for the linear park are as follows:

- Preserve darkness where appropriate.
- Give due consideration to both wildlife and human needs, particularly the perception of safety.
- Identify areas where lighting intervention is of net benefit.
- Identify opportunities for attractive feature/artistic lighting interventions.
- Highlight local cultural heritage.
- Encourage usage of the canal.
- Develop high level strategies for future design development.

Lighting Considerations for Wildlife and Sustainability

The lighting has a holistic response to both needs of people and the sensitivities for ecology, plants and animals. The effect on the natural environment can be particularly complex and so the impact of artificial lighting along the Super Slow Way linear park will have careful consideration.

This means a sustainable approach, both during the construction and operational life of the lighting installation, ensuring the sensitivities on some plants and animals are carefully considered so as not to affect flowering periods or nocturnal behaviours.

Renewable energy sources such as wind power and photovoltaic panels will be used in areas where the linear park meets open landscape. Alternative energy sources can sustainably supplement the cabled main electricity supply. Using low energy consumption luminaires and motion detection will preserve lighting to limited periods after nightfall.

Lighting control systems will enable illumination levels to be controlled to meet the needs of the users and functions of each space whilst limiting disruption to surrounding wildlife. This results in energy savings, minimisation of operational hours and therefore reduced running and maintenance costs for the life of the system. As a minimum control methodology, luminaires will be linked to the hours of darkness and time of day. All exterior luminaires are to be switched off during hours of daylight and switched on at dusk.

The standard methods of exterior lighting control are:

- Photocell (light sensor)
- Programmable astronomic time-clock (programmable for variations at key dates and periods of the year)
- PIR (presence detection)
- Dimming (reduction of illuminance levels for certain periods of night)

Where feature lighting is installed, it is switched independently so that curfew times can be applied and illumination is provided only at times of maximum value. Functional will be switched on at dusk and will remain on until a predefined curfew time, or dawn. In areas of infrequent usage and/or environmental sensitivity lighting will switch to local automatic movement sensors so that illumination is provided only as and when required and switched off once the area is vacated.

The unlit condition will directly benefit the nocturnal landscape and the species of wildlife which naturally inhabit the region. As well as the provision of a linear park lighting strategy it is worth retaining the natural dark status of the canal within its local context, the benefits are as follows:

- Provides refuge for small nocturnal animals.
- Allows flowering of plants, migration of fish and birds.
- Supports natural behaviour and complex interaction networks between species.
- Provides opportunities for stargazing and space for peace and solitude.
- Zero energy consumption.

Lighting Principles

To protect features of ecological value present, the following five principles for responsible outdoor lighting have been developed by the International Dark-Sky Association:

1. Useful: all light should have a clear purpose
Before installing or replacing a light, determine if light is needed. Consider how the use of light will impact the area, including wildlife and the environment. Consider using reflective paints or self-luminous markers for signs, curbs, and steps to reduce the need for permanently installed outdoor lighting.
2. Targeted: light should be directed only to where needed
Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed.
3. Low Light Levels – Light should be no brighter than necessary
Use the lowest light level required. Be mindful of surface conditions as some surfaces may reflect more light into the sky than intended.
4. Controlled – Light should be used only when it is useful
Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible, and turned off to preserve energy usage and limit carbon footprint.
5. Colour – Use warmer colour lights where possible
Limit the amount of shorter wavelength (blue-violet) light to the least amount needed

By following these simple principles, electric lighting at night can be beautiful, healthy, and functional. These principles work together to reduce light pollution, save energy and money, and minimise wildlife disruption.

Lighting Intervention Opportunities

- Utilising darkness as the blank canvas to selectively curate the night time experience.
- Feature illumination to a host of heritage assets; mills, bridges, walls, facades – reinstating these elements back into the nocturnal visual landscape.
- Highlighting permanent art interventions and providing ready-made illumination for rotating art installations in designated locations.
- ‘Guerrilla’ temporary lighting interventions to draw attention.
- Using light to reveal and celebrate the unique character of the various locations and communities located along the canal.
- Create events to bring communities together.
- Seek a balance between attractive and safe lighting - to encourage human use - whilst preserving the nocturnal environment through targeted, controlled and appropriate lighting interventions.
- Working with the synergy of architectural structures, water and reflection.
- Provision of infrastructure within key areas to enable the deployment of illuminated temporary events/festivities.
- Lighting to support night-time connectivity between communities via route lighting, illuminated wayfinding and access points.
- Illuminated seating and rest areas on wider towpath sections to provide refuge, increase interaction with the local community and usage of the canal area.
- Several potential locations for larger-scale landmark lighting installations including Gasholder and several mills/mill chimneys where local artists and communities may be engaged.
- Provide opportunity for elements of interactive lighting along the length of the Super Slow Way linear park, whether triggered by movement sensor, timeclocks, or mobile phone apps.
- Sensitive incorporating lighting into branding and signage, potentially using elements of colour, to provide a coherent night time recognition. Where colour is used it should be coordinated with the branding colours as part of a recognisable palette.
- Support branding using light applied to various elements and structures for events, festivals and dates. A colour strategy will be applied sensitively.

2.9.12 Lighting the Super Slow Way

Throughout the length of the linear park there are several opportunities to implement high-impact lighting interventions. High impact interventions are statement installations which deliver far-reaching impact beyond the immediate canal side location, become beacons of the linear park's development, and promote discussion and engagement. Some installations will be temporary, although it is envisaged that most will be permanent, offering enduring value to the linear park and raising the profile of the area.

The following projects are high-impact interventions which are overlaid on the diagram opposite, forming a 'string of pearls' along the entire length of the linear park:

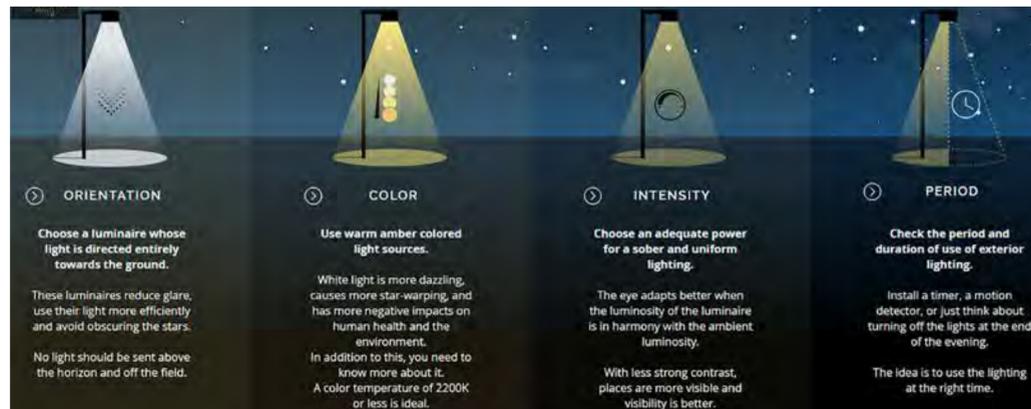
- Imperial Mill and Brierfield Mill
- Hargreaves Warehouse, Church
- 'Fairy Caves', Aspen Coke Ovens
- Brierfield Gasholder
- Gannow Tunnel, Burnley
- Significant bridges (motorway and other large bridges)
- Heritage Chimneys - various locations
- Walls - 'canyon' walls located between Hargreaves Warehouse and the Coke Ovens

The above projects are not presented in order of hierarchy, or chronology, it is recommended that early projects focus on bookending the linear park, to define both ends of the route to generate early interest and publicity. Such projects would comprise Imperial Mill, Brierfield Mill and the Gasholder.

Following implementation of the above, other projects can be phased to in-fill in between, creating continuity along the Super Slow Way Linear Park.



High-impact lighting interventions



Dark sky lighting recommendations © Mont-Megantic International Dark-Sky Reserve

2.9.13 Building Exteriors & Structures

Illuminated architecture shapes the night time environment and reveals character during the hours of darkness. It enhances the cultural value and attractiveness of space. Different lighting techniques and concepts allow buildings of various ages, form, scale and materials to be seen at night, creating beacons in the nocturnal landscape.

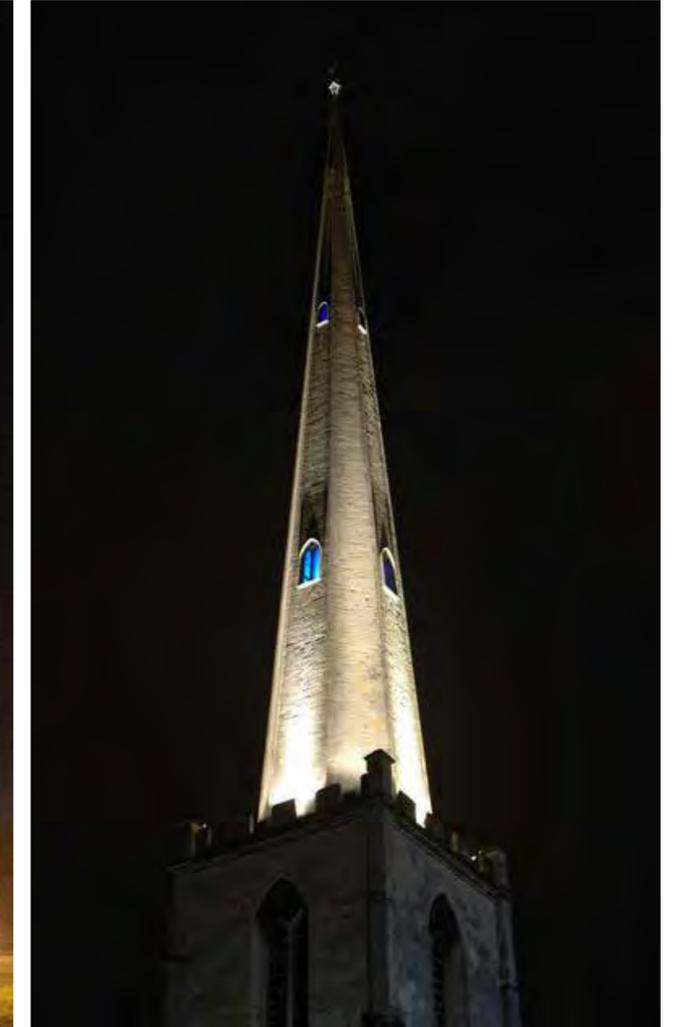
It is recommended that a hierarchy is adopted whereby the most architecturally, culturally and historically important buildings are celebrated, via illumination, in recognition of their significance to the area.

Recommendations:

- Colour temperatures selected to match the materials to be lit.
- Lighting using good colour rendering.
- Close offset linear lighting emphasises the surfaces of the facade without altering the architecture.
- Precise accent lighting to pick out distinctive architectural details.
- Different luminance levels on various surfaces differentiate the foreground from the background.
- The facade lighting must not cause nuisance to neighbouring buildings.
- Spill light into the sky is to be minimised.
- Lighting for all feature elements to be subject to a curfew time ensuring energy is not wasted and luminaire-life maximised.



Daniel Penfield, CC BY-SA 4.0, via Wikimedia Commons



Philip Halling, CC BY-SA 2.0, via Wikimedia Commons

2.9.14 Bridges & Walls

Generally, bridges are seen against a dark background so there is not as much need for high levels of illumination compared with a typical building in a city centre.

Bridge use, road safety and regulations, reflections off water, plus the impact on local residents and wildlife are all key considerations for achieving the most suitable bridge lighting design.

Recommendations:

- Allow space for relative darkness to provide an ambience appropriate to the space.
- Lighting should use good colour rendering, so as not to distort the colour of the materials and finishes.
- Luminaires should use precise optical control to limit light spill and sky-glow.
- Consider a 'dark night' turning off non-essential lighting to help save energy.
- Colour temperatures should be selected to match the materials to be lit.
- Coloured lighting can be used for an effect, i.e. historic reference.
- Close offset linear lighting emphasises the surface texture and materiality.



Image: © Miguel Arruda



Precedent images of illuminated walls and underpasses

2.9.15 Events and Installations

Events are transient and lighting equipment is usually imported for the event or festival and then removed. A flexible infrastructure to facilitate event lighting and temporary installations could be introduced at key locations such as that at Sandygate Square, Burnley. This aids in reducing setup friction, cost and help ease of installation and removal of lighting equipment for a variety of events.

Technological developments in lighting have resulted in an increased use of compact and efficient light sources to highlight features. Light itself can also be used as a form of artwork an emerging discipline of light artists who specialise in this art form.

The 23 mile stretch of the canal offers a great variety of potential locations for lighting features; bridges, conservation areas, listed buildings, wall structures and the canal waterway itself provide hundreds of possibilities. Some subtle installations could be added on an annual basis to highlight historic sites and create visual interest during the hours of darkness. Temporary and more transitional lighting events throughout the year can celebrate various locations on site, create walking routes, attract visitors and breathe new life into the area.

Recommendations:

- Identify areas where temporary and permanent installations for events or lighting features could be installed.
- Allow power and structural fixing provision for luminaires. Where applicable, power provision should be considered as part of the individual buildings'/structures' electrical design.
- Design of associated cable management needs to be carried out to eliminate ill-considered electrical and data interfaces
- Light spill and light trespass should be addressed and any scheme proposed should be complete with a programmable curfew to extinguish the scheme.
- Light festival to cover several sites and introduce various light artists within the 23 mile length.
- Opportunities for community engagement to be explored.
- Dark areas within the site provide a platform for various events i.e. stargazing, learning how to navigate the stars, night time photography and guided bat walks.



Image: 'Things That Go On Things'



Courtesy of Bill Fitzgibbons, Light Rails

2.9.16 Footpaths, Pedestrian Areas and Cycle Paths

Lighting enables the navigation of routes in the hours of darkness, assisting users in wayfinding, recognising changes in level, direction, obstacles and identification of other users. It is envisaged that the towpaths will primarily be used by pedestrians and cyclists in various volumes according to the locale.

As discussed in this document, not all routes within the linear park should be lit; a case must be made in terms of human use, wildlife, local precedent and surrounding context. Following a suitable assessment, where it is determined that the addition of lighting is of net benefit, the following considerations are recommended.

Recommendations:

- Optical control is crucial to minimise spill light beyond the immediate target area.
- The scale and mounting heights of lighting equipment are to be selected with due consideration to their context, surroundings, use of the space and type of traffic.
- Access points should be illuminated.
- Lighting controls are to operate luminaires when and where needed. All lighting must be switched off during the hours of daylight.
- Solar-powered way marking luminaires are to be investigated and appraised according to the latest technological developments, with battery life and longevity being primary concerns
- Lighting must enhance the feeling of safety and security. Where CCTV is required, lighting is to be coordinated with camera requirements.
- In areas of high environmental sensitivity low-level luminaires, bollards or floor grazing luminaires recommended for minimal intrusion into the night time environment.
- Lighting to changes in level is of particular importance, dedicated lighting to steps is recommended - this may be achieved through integral handrail lighting
- Where columns are employed, they are to utilise adjustable optics for optimal focussing and minimal light spill.
- Lighting for pedestrians should be designed to reflect and respond to the scale and speed of movement of the pedestrians. The location of lighting equipment along routes should aim to minimise intrusion into the route and visible clutter
- Equipment is to be suitable for the application with respect to its resistance to vandalism and the ingress of dirt and moisture.
- Route lighting varies according to usage of each space, the design is to be considered and risk assessed according to the relevant guidance.



Image taken from Hess website



Image taken from Hess website

2.9.17 Landscape, Greenery and Canal

The key to successful landscape lighting is subtlety and selectivity. In most cases, there will be little competing light, so even low light levels will have a considerable visual impact. Water is a great asset to any lighting scheme. Lit effect is multiplied through reflections from the surface of the water where one luminaire becomes two, so calibrating the impact of each light source is essential to each scheme.

Lighting to soft landscape elements along the canal such as trees, plants and grass ensures that the green character and quality of the space are not lost during the hours of darkness.

Feature lighting to hard landscape interventions, such as integrated bench lighting, will help to create a welcoming pedestrian environment and encourages social interaction during the hours of darkness.

Recommendations:

- Lighting to selected trees; uplighting, festoon lighting, tree-mounted downlighting
- Low level lighting to emphasise greenery, framing the towpath and far side of the canal.
- Schemes to consider the impact of reflected light from surface of the canal
- Adjustable optics for optimal focussing and minimal light spill.
- For inground luminaires it is essential to specify high quality luminaire brands only, to withstand water ingress or vandalism.
- Within higher value areas luminaires can be located within the tree canopy. Mock ups are recommended.
- Post-mounted low-level lighting is valuable within high quality areas.
- Low-level lighting and shielded, dark-sky luminaires can help reduce the risk of light spill and glare across the water.
- Luminaires appropriately scaled to complement the character of each area.
- Lighting for all feature elements to be subject to a curfew time ensuring energy is not wasted and luminaire-life maximised.



Image taken from Hess website



Image taken from Hess website

2.9.18 Art

Considering the nature of the works of art, their setting and their siting, will include looking at the various ways in which art may be introduced, whether through infrastructure, where the artist collaborates with the landscape architect to become an integral part of the landscape, or specific commissions. The commissioning process with communities can act as a catalyst in the development of the linear park's distinctive identity.

Serial pieces, repeated elements with a similar theme or quality, could be curated and located throughout the canal corridor.

Other locations can provide the opportunity for temporary activity and interventions while medium term interventions could include transformation of walls and facades, pop-up pavilions or light installations. These works can be programmed and curated as part of the Super Slow Way Linear Park experience, connecting internal exhibits within the focal landmarks and buildings, with the external setting and linked interpretation pop-up events and activity to unite the linear park and canal.

The diagram on the opposite page illustrates locations for art interventions and trails located along the canal and linear park.

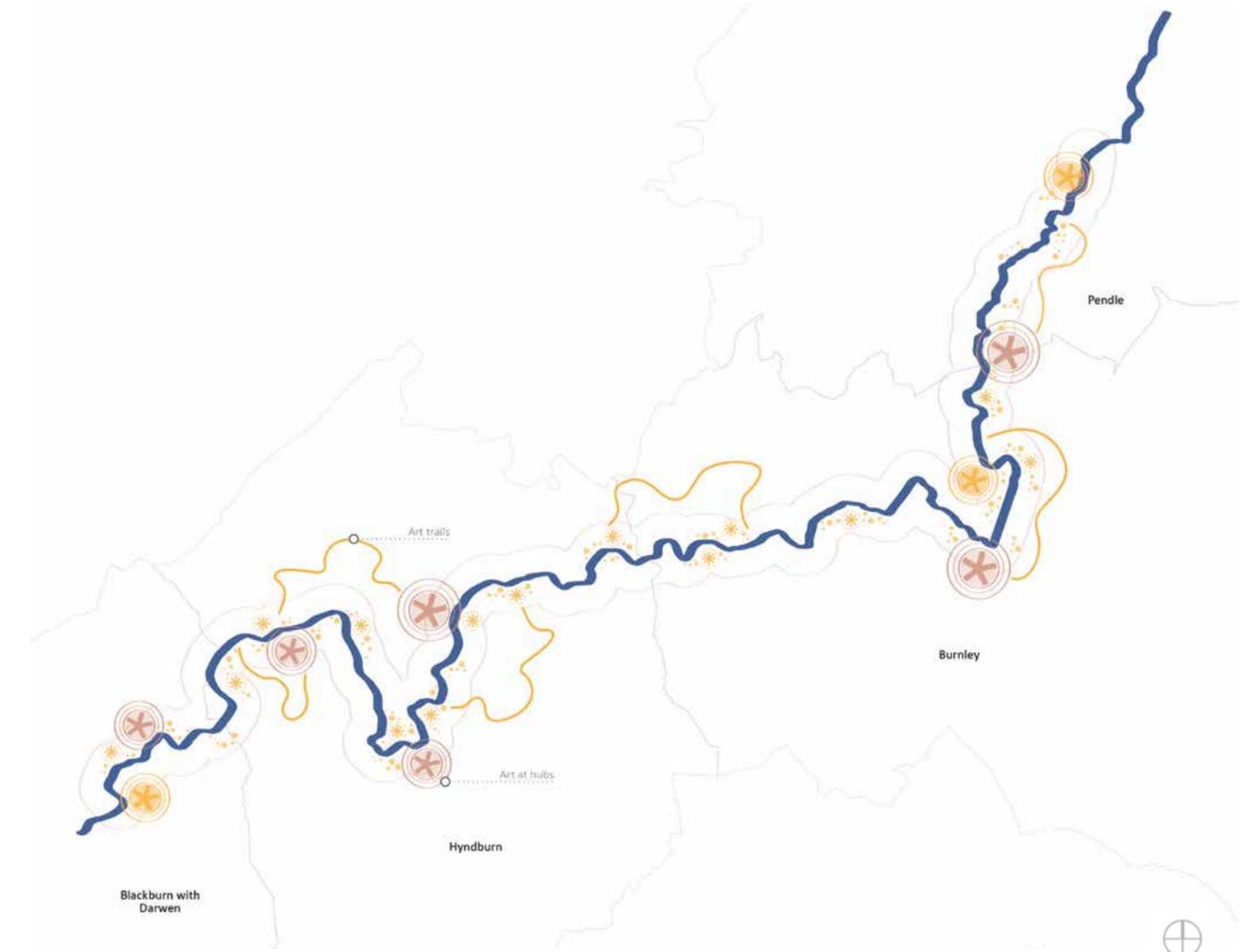


Ruhrfisch, CC BY-SA 4.0 , via Wikimedia Commons

2.9.18 Art

KEY:

-  Sculpture/ Installations
-  Outdoor Gallery Spaces
-  Smaller scale/ community art interventions
-  Sculpture Trails



Locations for art interventions along the canal corridor



3

The Super Slow Way
Linear Park
Area Plans for Development

3.0 AREA PLANS FOR DEVELOPMENT

3.1 Blackburn with Darwen

The adjacent diagram defines the Blackburn with Darwen priority study area and has been prepared to showcase the various links and opportunity areas which could be addressed within the area. This diagram precedes the development of the area based projects which have been addressed in more detail within the potential projects report. Blackburn has an abundance of opportunity areas which could be pursued as future potential projects, the diagram highlights the Blackburn Gateway, which connects the train station to the canal and its surroundings. Another prominent project is the Imperial Mill site which has an abundance of green space surrounding it which could be utilised to showcase the Imperial Mill and provide a new city park. Other smaller interventions look at the introduction of lighting and clearing the canal towpath of debris.



Diagram not to scale

3.0 AREA PLANS FOR DEVELOPMENT

3.2 Hyndburn (Church)

The adjacent diagram defines the area of Church within the Hyndburn priority study area and has been prepared to showcase the various links and opportunity areas which could be addressed within the area. This diagram precedes the development of the area based projects which have been addressed in more detail within the potential projects report. The area of Church and its surroundings has a rich ecological and heritage connection to the landscape which should be showcased. Opportunity areas include the Hargreaves warehouse site and the Dunkenhalgh park. Subtle interventions such as clearing and cleaning the back of industry units will help to improve the appearance of the area and provide a catalyst for improvement.



Diagram not to scale

3.0 AREA PLANS FOR DEVELOPMENT

3.3 Hyndburn (Clayton le Moor)

The adjacent diagram defines the Clayton le Moor area within the Hyndburn priority study area and has been prepared to showcase the various links and opportunity areas which could be addressed within the area. Clayton le Moor is much smaller than the other project areas and as such the opportunities for improvement are limited to the Enfield Wharf area and the area beneath the motorway and road bridges. As with the other stretches of the canal the area could be vastly improved through clearing away debris and maintaining the canal edges and waterway and by creating connections to the wider areas such as Mercer Park and allotment areas.



Diagram not to scale

3.0 AREA PLANS FOR DEVELOPMENT

3.4 Burnley

The adjacent diagram defines the Burnley priority study area and has been prepared to showcase the various links and opportunity areas which could be addressed within the area. Burnley has a series of areas which are already identified as development opportunities within the local plan. The diagram seeks to show new areas within Burnley which could be addressed such as the area beneath the bridge flyover within the Weavers Triangle, improvements to the straight mile and gateway connections. Within Burnley there are a series of vertical facades which could be improved through the addition of green walls and floating planters.

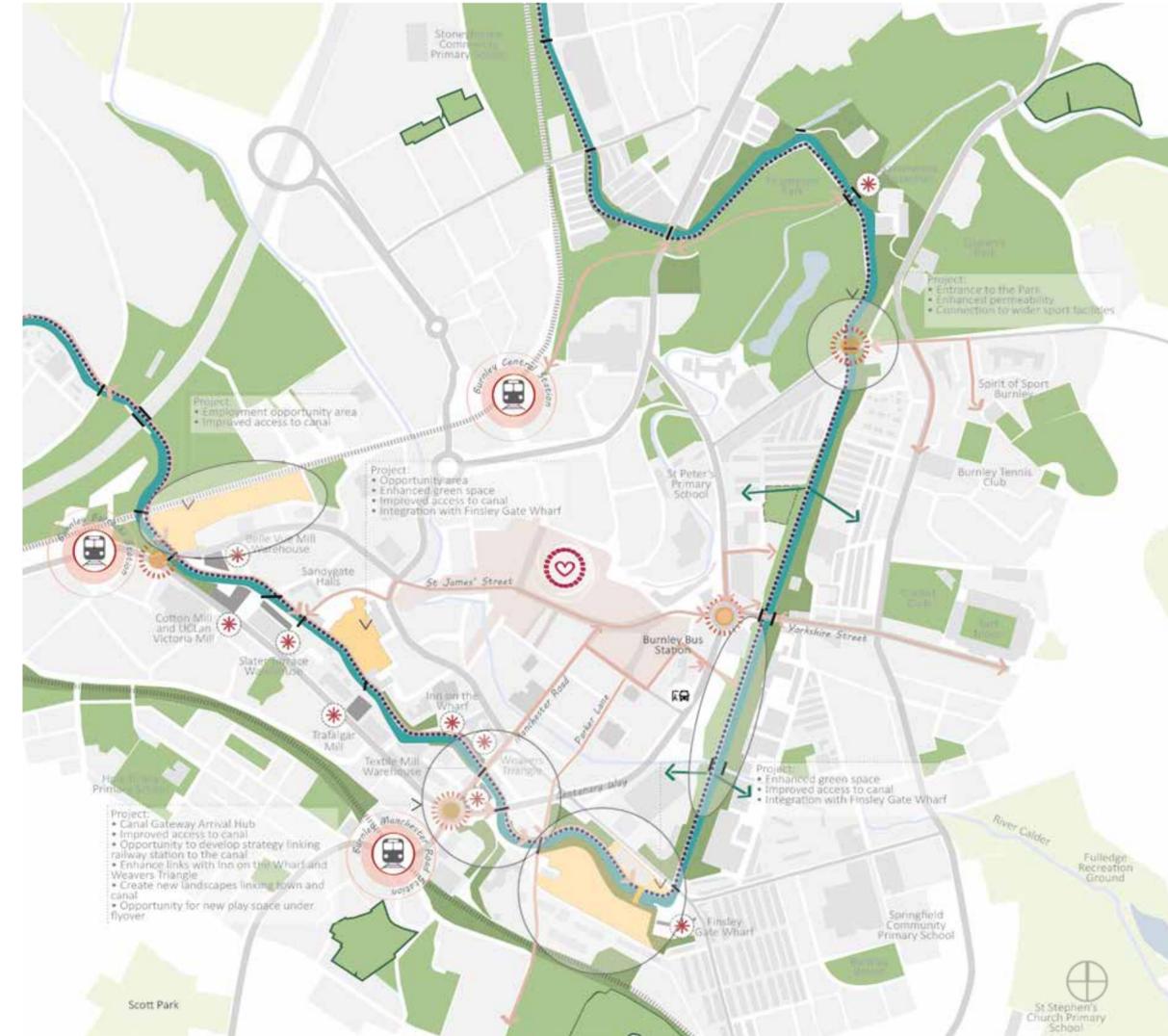


Diagram not to scale

3.0 AREA PLANS FOR DEVELOPMENT

3.5 Pendle

The adjacent diagram defines the Pendle priority study area and has been prepared to showcase the various links and opportunity areas which could be addressed within the area. The diagram defines the opportunity areas adjacent to the Northlight building, the Brierfield Gasholder, the area adjacent to local primary schools and canal towpath improvements.

- KEY:**
- Leeds and Liverpool Canal
 - Watercourse/ Reservoir
 - Accessible green spaces
 - Sanctuary/ stepping stone habitat
 - Green space off site
 - Community garden
 - Building
 - Town center
 - * Heritage feature/ key landmark
 - Feature wall
 - Focal point
 - Railway line
 - Existing bridge
 - Potential bridge link
 - National Cycling Network
 - Proposed cycle route
 - Pedestrian connection
 - Opportunity site
 - Development site
 - * Gateway
 - Potential views
 - Key project area



Diagram not to scale



4

The Super Slow Way
Linear Park
Appendix

4.0 LIGHTING TECHNICAL CONSIDERATIONS

4.1 Technical Considerations for Future Developments

Here we highlight key technical considerations for future lighting interventions within the linear park. They aim to raise awareness of key issues which will need to be addressed during the technical design stage of any lighting intervention as part of a design approach which offers long-term durability, quality, and value to the client.

CCTV & Security

Light levels and colour rendering requirements vary according to the CCTV specification. In areas where CCTV coverage is deemed necessary it is recommended that a CCTV specialist be consulted to inform the minimum required lighting levels and quality of light. During detailed design risk assessments are to be undertaken in line with the latest guidance to ensure the appropriate light level is selected.

Maintenance

To assist with estimating the maintenance burden of a lighting intervention following a detailed design, details of the light source life and luminous flux depreciation should be obtained from the manufacturers and used to provide accurate maintenance factors and regimes.

The light source, hours of operation, area the luminaire is in, its style, coating/ finishes and dirt and moisture ingress protection all contribute to the overall maintenance factor for the system and installation. In order to offer the maintenance teams an accurate maintenance schedule the above factors must be taken account of and incorporated within the design proposals.

Lighting Control

A lighting control system(s) must be provided to enable illumination levels to be controlled to meet the needs of the users and functions of each space whilst limiting disruption to surrounding wildlife. This shall result in energy savings, minimisation of operational hours and therefore reduced running and maintenance costs for the life of the system.

Methods of Control

As a minimum control methodology, luminaires shall be linked to the hours of darkness and time of day. All exterior luminaires are to be switched off during hours of daylight, and switched on at dusk.

The standard methods of exterior lighting control are:

- Photocell (light sensor)
- Programmable astronomic time-clock (programmable for variations at key dates and periods of the year)
- PIR (presence detection)
- Dimming (reduction of illuminance levels for certain periods of night)

Whilst photocell and time-clock control are minimum requirements, presence detection and dimming are optional, as they are not suitable for certain applications and may be budget-dependent.

At a strategic level two layers of light are proposed, feature lighting and functional lighting - to aid navigation.

- Where feature lighting is deployed it should be switched independently so that curfew times can be applied and illumination is provided only at times of maximum value. An assessment is required for each intervention and may be subject to planning constraints.
- For functional navigation lighting it is generally envisaged that this is switched on at dusk and would remain on until a predefined curfew time, or dawn. This would be dependent upon location and usage. In areas of infrequent usage and/or environmental sensitivity lighting may be switched according to local automatic movement sensors so that illumination is provided only as and when required and switched off once the area is vacated.

More sophisticated lighting controls also offer the opportunity to interact with certain feature/light-art installations via sensors, web portals and mobile apps. 'Show controls' also enable certain theatrical effects to be deployed at specific times and for specific events to deliver unique experiences which don't tire due to overuse.

The analysis of available daylight detailed in this document should be used to access the impact of operating lamps between dusk and dawn or curfew time for feature lighting.

All lighting classifications are maintained levels. The maintained level is the minimum level acceptable before cleaning and re-lamping is necessary. It is essential that the appropriate luminaire cleaning and replacement routines are closely followed. Each project should be delivered to the client with an agreed and predetermined maintenance routine in order that the client can understand the long term implications of any lighting proposal.

All installations must be maintainable, if they are not, failed luminaires will not be replaced and the installations will eventually deteriorate.

The design, construction and location of lighting equipment will permit ease of maintenance without major disruption to the operation of the areas. Luminaire, reflector and glass/ diffuser can be cleaned using proprietary methods and fluids as recommended by the manufacturers. Rogue failures should be replaced individually as soon as is practical. Where tree straps are employed they should be checked and adjusted as the tree branches grow at periods determined by the landscape architect, or other suitably qualified person.

4.0 LIGHTING TECHNICAL CONSIDERATIONS

4.2 Quality of Light

Quality of light is key to creating quality environments. It is recommended that LED light sources are used throughout the linear park for all lighting equipment. LED provides superior longevity, colour rendering and energy consumption. At the time of writing, LED technology is a rapidly evolving technology, therefore prescriptive recommendations are short-lived. Any recommendations made will likely be superseded in the near future. However, the following technical parameters are described for consideration in future works:

Colour Rendering Index (CRI)

Colour Rendering Index (a measure of the ability of a light source to accurately render colours) and Colour Temperature have a major influence on people's perception of the environment. By using sources with excellent colour rendering properties and the appropriate colour temperature, users will perceive these areas as high quality environments. For the Linear Park, a minimum colour rendering of Ra 80 is recommended.

Colour Temperature Strategy

Natural light varies in colour temperature throughout the day according to the elevation of the sun. Cooler colour temperatures are reached at noon and the warmest colour temperatures occur at both sunrise and sunset.

E.g. Cool: midday sun and daylight and moonlight. Warm: firelight, sunrise and sunset.

Selection of the appropriate colour temperature is dependent upon the colour of the surfaces to be lit, the application and the atmosphere desired. The below should be considered during the selection of a light source's colour temperature:



Warm light (<3000K)

Enhances warm colour materials, e.g. red brick, sandstone. Creates a softer, relaxed, warmer atmosphere. Warm light can be used in areas where pedestrian usage is encouraged and to increase dwell time.

Neutral (4000K)

Neutral white light of around 4000K is a good intermediate tone with a wide variety of applications. As colour temperatures can appear cooler at night than when viewed during the day even 4000K can be perceived to be relatively cool.

Cool (>5000K)

A cool colour temperature works well with certain materials such as concrete, steel, and white finishes which require a 'clean and crisp' appearance. Cool CCT light appears brighter than warm light sources with the equivalent light level. Cool light tends to provide a more clinical atmosphere and may be more appropriate for busy vehicular routes.

Designers should be mindful of the adjacencies of varying colour temperatures and ensure that there is a coordinated strategy throughout sites and along routes.

Homogeneity of colour temperature amongst identical lit elements is encouraged where the area or route is considered to be 'one'. Conversely a variation of colour temperature can be used to differentiate between routes or areas where this is desirable.

We propose warm colour temperatures (2700K-3000K) to provide more relaxed feel during the hours of darkness, with elements of neutral white light (4000K) for planting and where it suits specific material finishes.

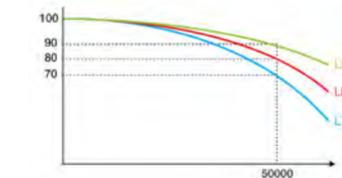
LED Lifetime, Longevity & Performance

The output of LED light sources degrades over time according to usage. There is broad diversity in the quality of LEDs on the market, to enable a like for like comparison of products the following methodology and metrics are generally used.

Performance Degradation (Light Loss Over Time)

Degradation is expressed as a percentage of original light output at X thousand hours, L%. E.g. L90 at 50,000hrs means that at 50,000hrs usage the LED will provide 90% of the original stated output. Although some manufacturers provide different output/time variations usually the L values of L90 and L70 are used at 50,000hrs. At an equal number of hours, the higher L value the better. I.e. L90 is preferable to L70, which in turn is preferable to L50.

As the technical design is developed we recommend a review of the available LED technology at that time to ensure minimum quality benchmarks are included within the specification to minimise the maintenance burden of the lighting installations.



Colour Consistency

'Colour consistency refers to the average amount of variation in chromaticity among a batch of supposedly identical light sources' (Lighting Research Centre). The quality of LED light sources can vary greatly. Poor colour consistency is to be avoided as it produces unattractive results.

There are two key considerations with respect to colour consistency:

- Initial consistency - the day one quality
- Lifetime consistency - how much the product shifts over time due to usage

The colour consistency metric is Standard Deviation Colour Matching (SDCM) which is equivalent to a MacAdam ellipse. Light sources with 2 SDCM or a 2-step MacAdam ellipse will appear to be consistent to the eye. Variation greater than 2 SDCM will become noticeable and should be avoided.

The image below demonstrates poor colour consistency in a low quality lighting installation as an example of that what is to be avoided.



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BDP.

BDP
11 Ducie Street,
Piccadilly Basin,
PO Box 85,
Manchester,
M60 3JA
United Kingdom