BLIND SPOTS IN ARCHITECTURE

HYDROCITY

BLIND SPOTS IN ARCHITECTURE #3

Biznesa, mākslas un tehnoloģiju augstskola "RISEBA", SIA

RISEBA University, Faculty of Architecture and Design

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BLIND SPOTS IN ARCHITECTURE

HYDROCITY:
URBAN WATER EDGE CONDITIONS IN "WIRRAL WATERS"

VOLUME 1

A COLLABORATION BETWEEN MANCHESTER SCHOOL OF ARCHITECTURE (MSA) AND RISEBA FACULTY OF ARCHUTECTURE AND DESIGN (FAD)

URBAN DESIGN LAB

BACHELOR'S PROGRAM

ARCHITECTURAL DESIGN 4 COURSE

JONAS BÜCHEL, EFE DUYAN, ILZE PAKLONE

LANDSCAPE ARCHITECTURE COURSE

MARC GELDOF, HELĒNA GŪTMANE, ILZE RUKŠĀNE

MASTER'S PROGRAM

INTERNSHIP IN ARCHITECTURE COURSE

EFE DUYAN, HELĒNA GŪTMANE, RUDOLFS DAINIS ŠMITS

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INTRODUCTION

In 2023, students from the Manchester School of Architecture (MSA) and RISEBA University's Faculty of Architecture (FAD) embarked on a collaborative design studio through which students developed masterplans for sites in each other's city to explore these goals.
The first-year of the collaboration Urban Design Lab was entitled "Hydrocity - Riga and Birkenhead," and was exhibited in Riga in March 2024. The collaboration will continue into 2024/25 with new sites and challenges in Riga and Manchester. While the experiment between Manchester and Riga focuses on parallel projects, the partnership could expand over time to include other schools, fostering a global response to collective urbanism.
This international exchange has seen contributions from students, academics, and practitioners from different parts of Europe. The final output exemplifies how a diverse range of expertise can culminate in pragmatic and reputable urban regeneration design methods. International collaborative urban labs are active research platforms amplifying the experiences of architecture and urbanism students worldwide.
RISEBA University Faculty of Architecture worked on Wirral Waters by critically engaging with the ongoing process at its urban design lab, combining three separate courses in collaboration with the Manchester School of Architecture. Wirral Waters is one of Europe's largest urban regeneration sites, on the left of the Bank of River Mersey, including the surrounding historical docklands of the Wirral Float.
This book presents the Urban Design Lab 2023/24 results in two volumes, namely the urban research results and design proposals.

Visions

The projects aimed to transform Wirral Waters into a vibrant and livable urban center, bordered by the neighborhoods of Birkenhead and Wallasey. Central to this vision was creating a new urban identity, marked by enduring aesthetics and innovative affordances. The proposals introduced a variety of new magnetic functions interpreted in contemporary ways centered around the Float, metaphorically, as a grand urban plaza filled with water. A key challenge was ensuring that these projects functioned as attractions for visitors without triggering gentrification, while preserving the continuity of the area's history and everyday life. The design approach embraced a delicate balance between the allure of a fresh start and the importance of respecting the de facto situation and retelling its historical narrative. Projects range from museums and a Highline to a power plant, bus station, recycling center, education and sports facilities, alongside contemporary workplaces and flexible housing. Architecturally, the designs balance iconic new structures with subtle interventions, blending embedded in historical context.

Hydrocity and The Context of Water

The presence of the Float and the River Mersey raised significant ecological concerns and prompted discussions about the treatment of the waterfront. In response, a continuous, accessible public promenade along the water's edge was designed to symbolically unify the new urban identity. The promenade's enhancement of the waterside experience was carefully studied, incorporating micro-analytical approaches to consider views both across and towards the water.
Additionally, how the architecture would be perceived from the opposite side of the Float and the River Mersey became a critical design consideration. Some designs introduced additional channels, creatively enhancing water exposure. Accessibility was prioritized through pathways connecting the Float to surrounding residential areas, positioning the whole site almost as a transition zone toward the water. As a result, the projects heavily focused on engaging with and emphasizing the various biophilic aspects of water. They are about the water as much as they are around it.

Connectivity and Movement

To emphasize the emerging prominence of Wirral Waters, the project prioritized establishing solid connections with nearby towns through the development of bus and water transport hubs. Internal connectivity was also enhanced with the introduction of water-based transportation within Wirral Waters, alongside the addition of sports activities such as rowing, sailing, and cycling to encourage movement. To avoid isolating the site from surrounding neighborhoods, landscape design focused on creating inviting, accessible spaces, including a continuous promenade linking the entire area. Several projects pushed boundaries to stimulate activity, proposing features like a Highline, tectonic landscaping, a green corridor to the historical Birkenhead Park, public plazas, a bus station, a micro-mobility hub, water canals, mini-floats, and bridges. These elements share a common goal: enhancing connectivity, preventing isolation, and generating multiple benefits for the area's revitalization. In this sense, movement and connectivity were not merely functional aspects but became integral design features, vital to the success of the revitalization efforts.

Identity

The research has revealed that underground structures and geology perhaps had a more significant yet subtler impact on the identity and development of the territory than more common or visible structures investigated. It led the teams to keep a close eye on the materiality and look for deeper historical connections. The historical significance of Birkenhead Park and the industrial heritage of the docks prompted discussions on adaptive reuse and the aesthetic dialogue between old and new, as well as the role of collective memory. Existing warehouses and dockland features, including rail tracks, piers, cranes, steel bridges, and even a sunken ship, served as sources of inspiration for adaptive reuse. Respecting and, at times, challenging the site's genius loci was essential. Some projects adopted straightforward adaptive reuse strategies, while others employed symbolic and bold aesthetic gestures to evoke the site's historical identity. This identity is seen as key in crafting a new narrative for the area, one that attracts new residents and visitors without alienating the existing community. The projects aim to integrate the historical identity into a regenerated urban brand, balancing new, vibrant functions for the future denser population with local integration, ensuring that the evolving identity is embraced by both newcomers and long-term inhabitants.

Conclusion

The Wirral Waters project presented a pathway of creatively moving forward so that, along the way, the approach has the potential to transform the site into a point of attraction and prepare it for the possible consequences. Our designer consciousness was divided between the top-down attention given to the charming power of building and the bottom-up attention to the ecological and urban sensibilities. Our Wirral Waters is almost a meta-design about the uncomfortable coexistence of the allure of tabula rasa and the conformity of continuity. It seems self-aware of its own double act of coming under the spotlights and being socially responsible.

Efe Duyan, Rudolfs Dainis Smits

RESEARCH

HYDROCITY: WIRRAL WATERS PROJECT

RESEARCH LAYERS

MASTER'S PROGRAM

INTERNSHIP IN ARCHITECTURE COURSE

R1. BLUE STRUCTURES

ANNA SAUROVA, BAIBA RIEKSTIŅA, INGUS BIRZNIEKS

R2. GREEN STRUCTURES

ARMANDS AIRTONS PAMPE, KRISTA PAULA LEPERE

R3. BUILT STRUCTURES

SINTIJA KĻAVINSKA, BĒRZĀJA MELDRA

R4. SOCIAL STRUCTURES

KSENIA SAPEGA, CAMILA YAUKOVA

R5. GREY STRUCTURES

ANDREJS KOPILS, SERGEJS KOPILS

R6. UNDERGROUND

REINIS SALIŅŠ

R1

BLUE STRUCTURES

Structures related to water bodies (aquatic systems and wetlands), territories affected by water, water management, and marine infrastructure.

“Blue structures” refers also to various man-made constructions or engineered elements within the marine or aquatic environment. These could include ports, docks, harbors, dams, levees, or other constructions designed for water resource management, coastal protection, or marine transportation.

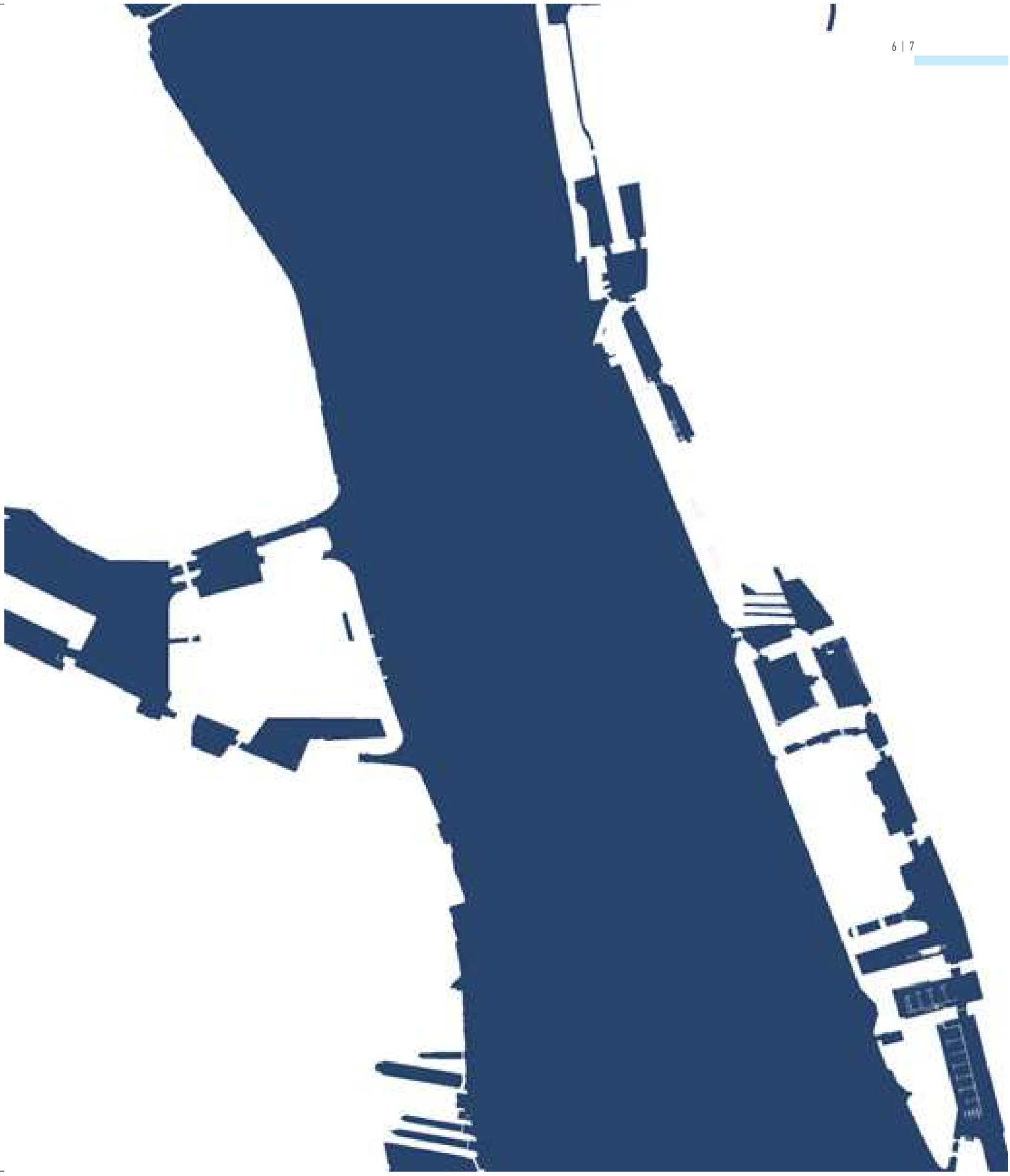
Within the scope of research, the “blue structures” encompass also characteristics related to and influenced by water, such as biodiversity, ecosystems of birds and animals, the quantity of rainwater, among others.

INTRODUCTORY SECTION

LOCATION OF WIRRAL WATERS IN THE CONTEXT OF EUROPE
WIRRAL WATERS RESEARCH STUDY AREA
OVERVIEW OF HISTORICAL DEVELOPMENT OF LIVERPOOL & BIRKENHEAD (WIRRAL WATERS)
DEVELOPMENT OF HISTORICAL PORT TERRITORIES OF LIVERPOOL AND BIRKENHEAD
AN OVERVIEW OF THE CURRENT SITUATION OF WIRRAL WATERS

RESEARCH SECTION

BIRKENHEAD DOCK DEVELOPMENT
TIDE GATES AND TIDE CHARACTERISTICS
POTENTIAL IMPACT OF CLIMATE CHANGE
DIVERSE WATER FEATURES: VARIANCES AND THEIR CHARACTERISTICS
CULTIVATING RAIN: STRATEGIC APPROACHES TO HARVESTING BIODIVERSITY
WIRRAL WATERS CONNECTIONS ACROSS AND UNDER WATER
WATERFRONT EDGE TYPES
INTEGRATION OF WATER FEATURES IN CURRENT WIRRAL WATERS MASTERPLANS




Liverpool
Wirral waters


Manchester
Tatton Park


Central Park
West Float
Birkenhead
Park
Birkenhead


Rupert Lane
Recreation Grd
Liverpool
ead

1715.y. Old Dock (Liverpool's first dock)

1821.y. Prince's Dock

1832.y. Brunwick Dock

1836.y. Trafalgar Dock

1737.y. Canning Dock

1753y. Salthouse Dock

1771.y. George's Dock

1780.y. Manchester Dock

1788.y. King's Dock

1796.y. Queen's Dock

1846.y. Royal Albert Dock

1709.y. starting to build docks on River Mersey

At the same time, vase numbers of spacious warehouses customs, railway etc. were built alongside the docks, making Liverpool one of the largest and most efficient ports in the world.

1699.y. first recorded slave voyage

1807.y. abolition of slavery

until 1830.y

1207.y.

1715.y.

1821.y.

1830.y.

Liverpool
(Small small agriculturalt & fishing village. Lifer pol meaning: muddy pool or puddle)

King John grants Liverpool it a Royal Charter, establishing it as a borough to reinforce his interests in Ireland.

The first ever commercial wet dock opened in Liverpool - the Old Dock, originally known as Thomas Steer's Dock.

The Princes Half Tide Dock, which would later become part of the **modern marina**, is constructed

The city sees rapid growth due to its role in the industrial revolution, becoming **a hub for manufacturing and trade.**
Liverpool Triangle—the exchange of manufactured goods from the **Mersey hinterland** for slaves in **West Africa** who were in turn traded for sugar, molasses, spices, and other plantation crops in the **West Indies.**

Liverpool's Historical Evolution & Birkenhead Docks Construction

1846.y. Royal Albert Dock

1848.y. Stanley Dock

1848.y. Collingwood Dock

1848.y. Nelson Dock

1848.y. Bramley-Moore Dock

1852.y. Huskisson Dock

1860.y. Birkenhead Docks (Great Float- East Float & West Float)

1862.y. Brocklebank Dock

1881.y. Langton Dock

1927.y. Gladstone Dock

1830.y. slave trade continued

1840.y.

The **population of Liverpool expanded** significantly during this period due to **immigration** from various regions, including Ireland and other parts of Europe. The city became increasingly diverse, with a mix of cultures and languages.

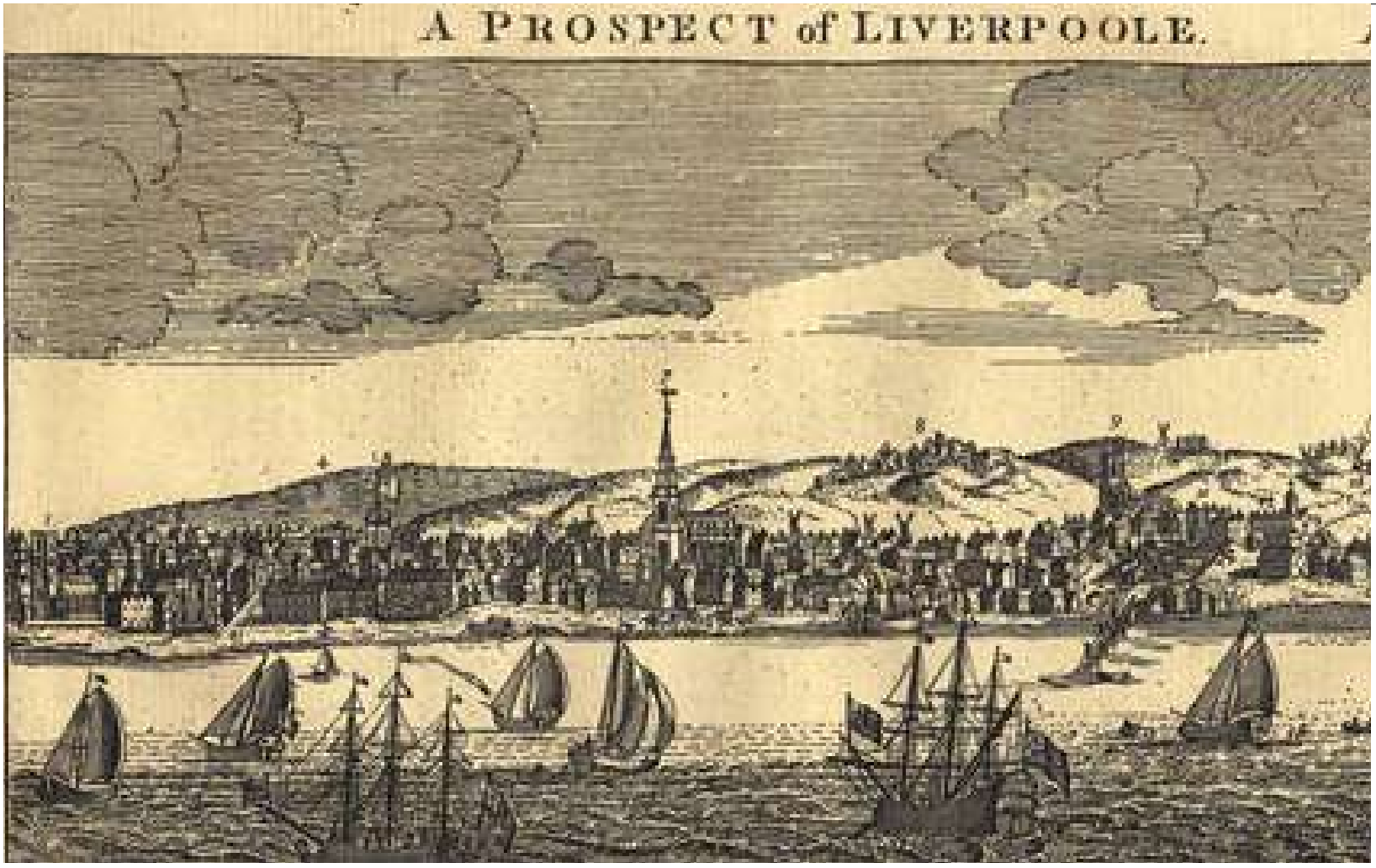
1900.y.

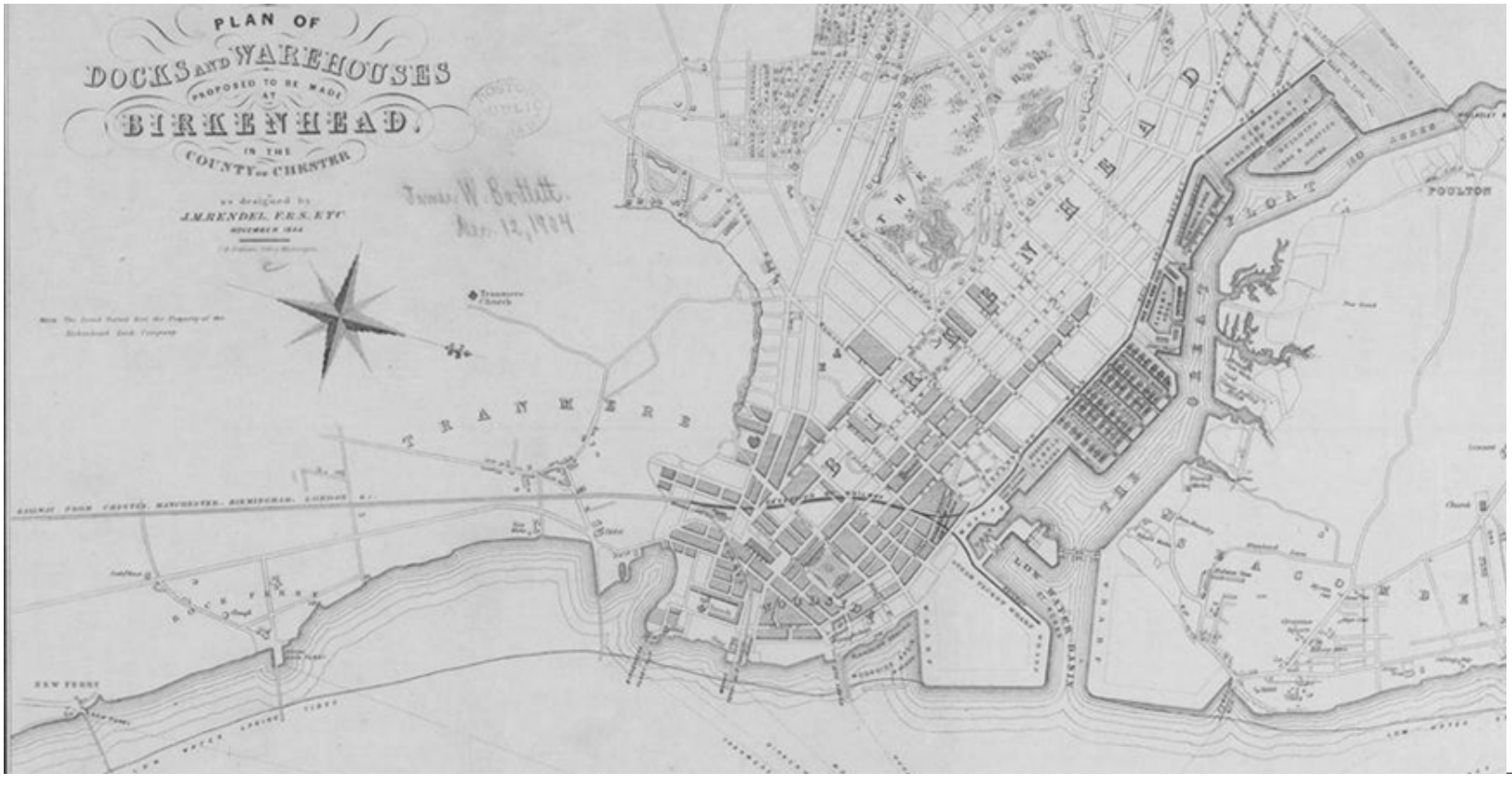
By the end of the 19th century, Liverpool's **global trade declined**, but it still traded with Europe. The docks, like Albert Dock, were ill-suited for the larger dimensions of modern steamships, making them unfit to host these vessels.

1914.y.

World War 1, which had a devastating effect on Liverpool's population and economy, that its dominance as a port came to an end.

The post-World War I period marked a time of adaptation and modernization for Liverpool's docks as they navigated changes in global trade, technology, and economic shifts, while striving to maintain their importance as a key port in the UK.


A PROSPECT of LIVERPOOLE.


PLAN OF
DOCKS AND WAREHOUSES
PROPOSED TO BE MADE
AT
BIRKENHEAD,
IN THE
COUNTY OF CHESTER
J.M. RENDEL, F.R.S. ETC
NOVEMBER 1844
Thomas W. Bartlett.
Nov. 12, 1904
BIRKENHEAD
POULTON
LOW WATER MARK

Historic Development of Liverpool

Liverpool, initially an agricultural settlement in Lancashire, evolved from a small market town struggling through economic decline in the Middle Ages. The first significant date in the history of Liverpool is 1207, when King John of England granted a charter for a planned new town there, but remained relatively insignificant until the 17th century. The silting of the River Dee led to Chester's decline, allowing Liverpool to rise as a port. It established crucial trading connections with Ireland, America, and the West Indies, setting the stage for its eventual status as a major UK port and became the second most important port in Britain.

Maritime town

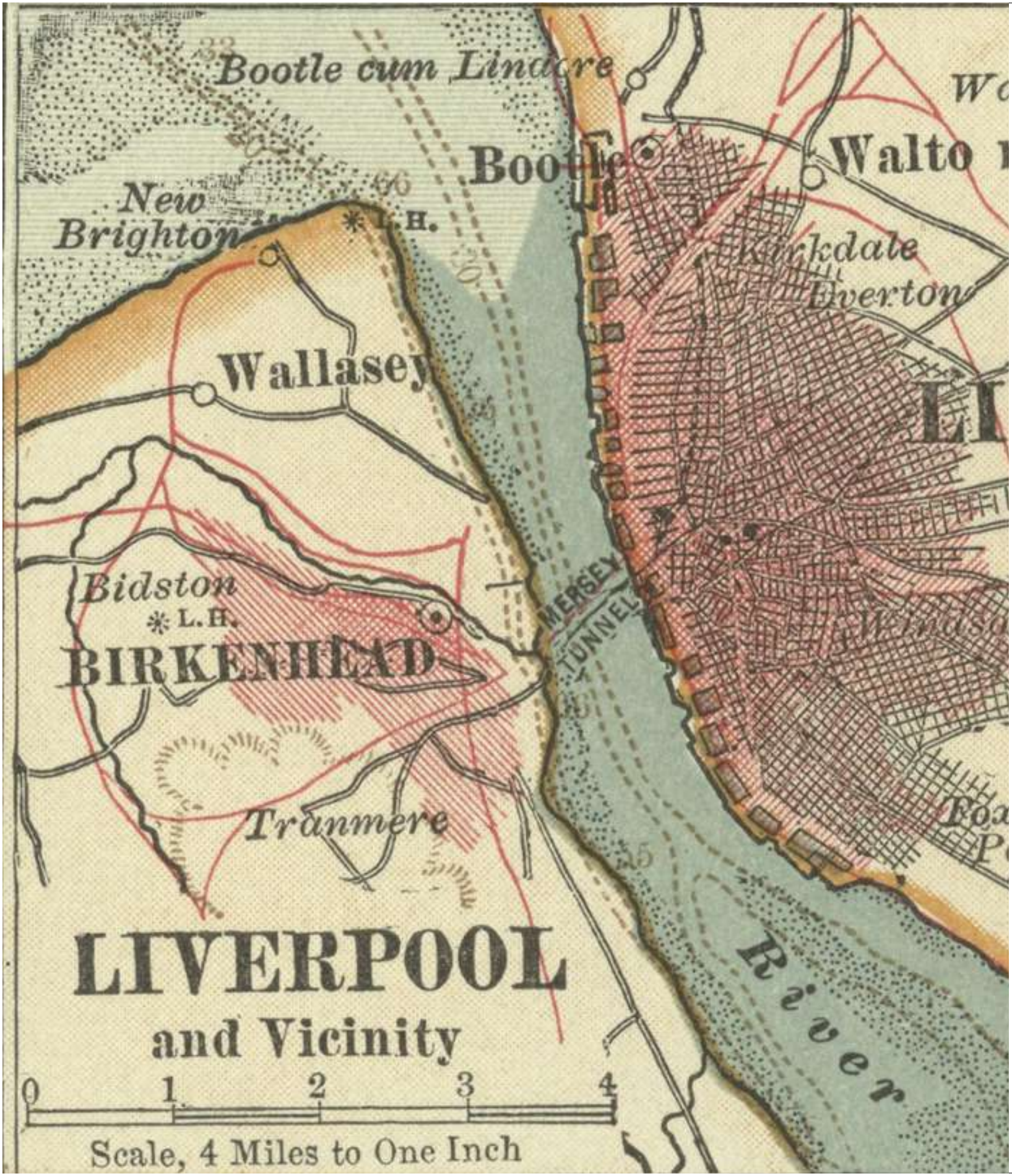
Liverpool's rapid growth surged after the 1660 Restoration. By the early 18th century, the city thrived in overseas trade, dealing in sugar, tobacco, grain, and timber, fostering a prosperous shipbuilding industry. This boom strained the natural harbor, prompting the need for a larger, purpose-built dock. Thomas Steers, a London engineer, constructed Liverpool's first famous dock, Old Dock, in 1715, marking the world's debut commercial enclosed wet dock. Its swift inadequacy led to the 1736 creation of Salthouse Dock and others, forming an intricate network of enclosed docks along the waterfront. Accompanied by vast warehouses, Liverpool swiftly became a major, efficient global port during the 18th century.

"Black gold"

Liverpool's involvement in the transatlantic slave trade during the 18th century was a defining period, propelling the city to prominence as one of the UK's major centers, second only to London. This trade brought immense wealth, funding the construction of opulent buildings using profits from the trade. By 1807, when slavery was abolished in Britain, Liverpool had emerged as a leading slave trade port, handling around 80% of Britain's slave trading. At its peak, over 130 ships from Liverpool were transporting approximately 45,000 slaves annually from Africa to North America and the Caribbean. Even after slavery's abolition, the trade persisted into the 1830s. Concurrently, Liverpool became a primary departure point for mass emigration, with an estimated nine million people leaving from the city's port for America, Canada, and Australia during the 19th century.

The trade triangle

Image and text source: https://www.britannica.com/place/Liverpool-England


Bootle cum Lindre
Bootle
Walto
New Brighton
L.H.
Kirkdale
Everton
Wallasey
Bidston
L.H.
BIRKENHEAD
MERSEY TUNNEL
Tranmere
LIVERPOOL
and Vicinity
River
0 1 2 3 4
Scale, 4 Miles to One Inch

Historic Development of Liverpool

Industrial Revolution
During the 19th century, Liverpool thrived on cotton trade, importing raw cotton from various countries and distributing it to Lancashire's mills for production and export. The opening of the Liverpool and Manchester Railway in 1810 further boosted the city's economy by enhancing transportation efficiency. By the century's end, Liverpool became the world's largest cotton trader, handling over half a million tons annually. This prosperity led to the construction of additional docks, notably the Albert Dock, renowned for its architectural and commercial success, catering to imports and exports spanning a range of goods from different regions.
However, by the late 19th century, Liverpool's global trade began declining, though European trade persisted into the new century. The usefulness of Albert Dock diminished with the advent of wider steamships incompatible with its entrance. Nonetheless, as the 20th century commenced, Liverpool remained a leading global trading port, encompassing vast docklands, warehouses, and factories covering seven miles. It wasn't until the onset of World War I that Liverpool's prominence as a port was disrupted, leading to devastating effects on its population and economy, ultimately marking the decline of its dominance in global trade.

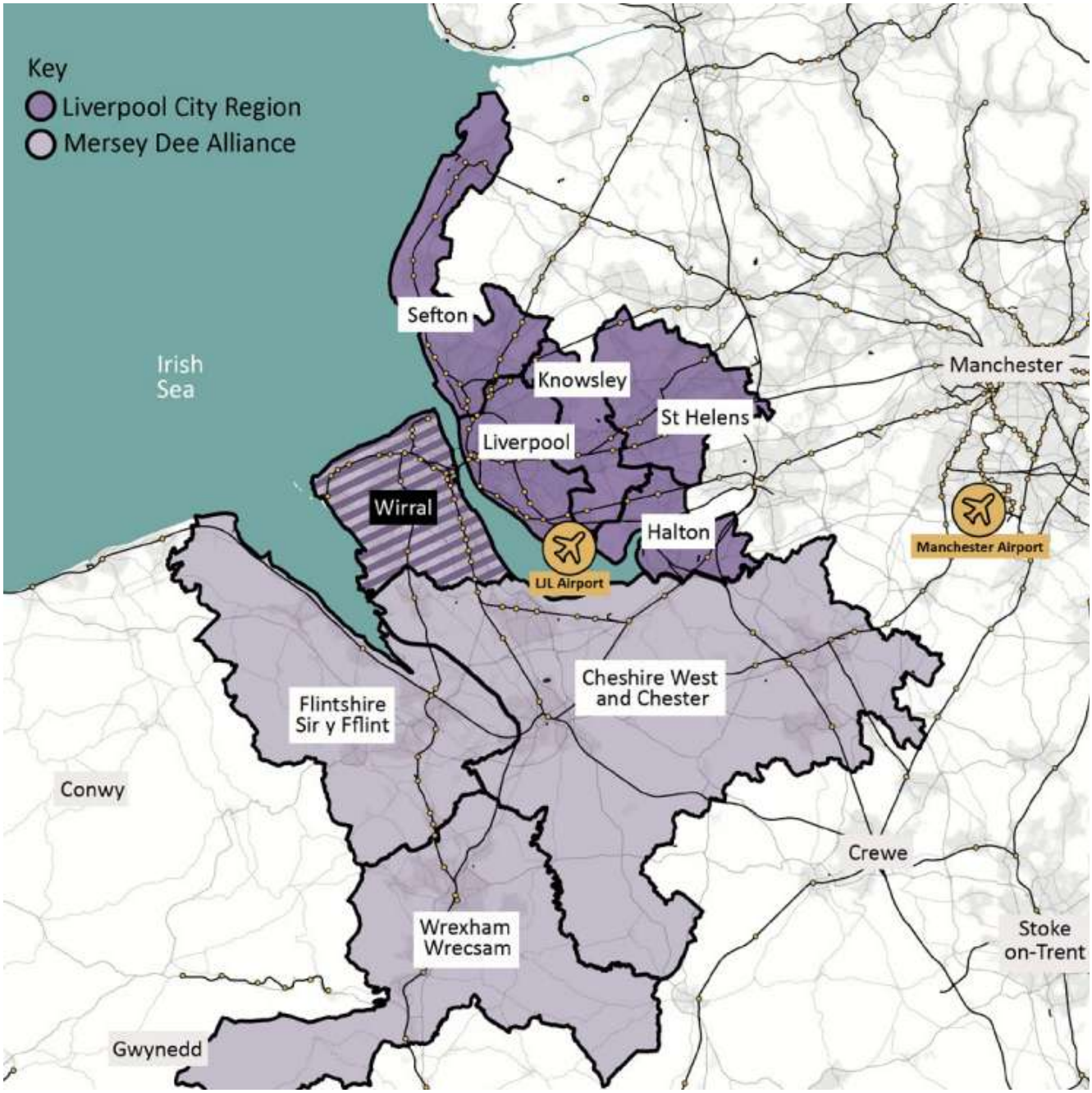
20th century
By the early 20th century, Liverpool had become the centre of 7 miles of docks extending along the Mersey from Hornby to Herculaneum, with ongoing improvements. However, post-World War II, it declined as a hub for exporting and passenger travel. This decline was linked to Liverpool's fading economic importance due to changes in its industrial connections and traditional trade routes to the US and West Africa, compounded by issues like low investment and high unemployment in the docks.

Liverpool remains a dominant force in its surrounding metropolitan area despite a decline in traditional activities like transport, communication, distribution, and shipping. These activities, while reduced, still hold economic significance for the city. The port has evolved into a significant hub for containerized shipping and became a cruise ship terminus in 2012.

Wirral, situated in northwestern England, constitutes a significant portion of the Wirral peninsula, enclosed by the River Mersey, the Irish Sea, and the River Dee.

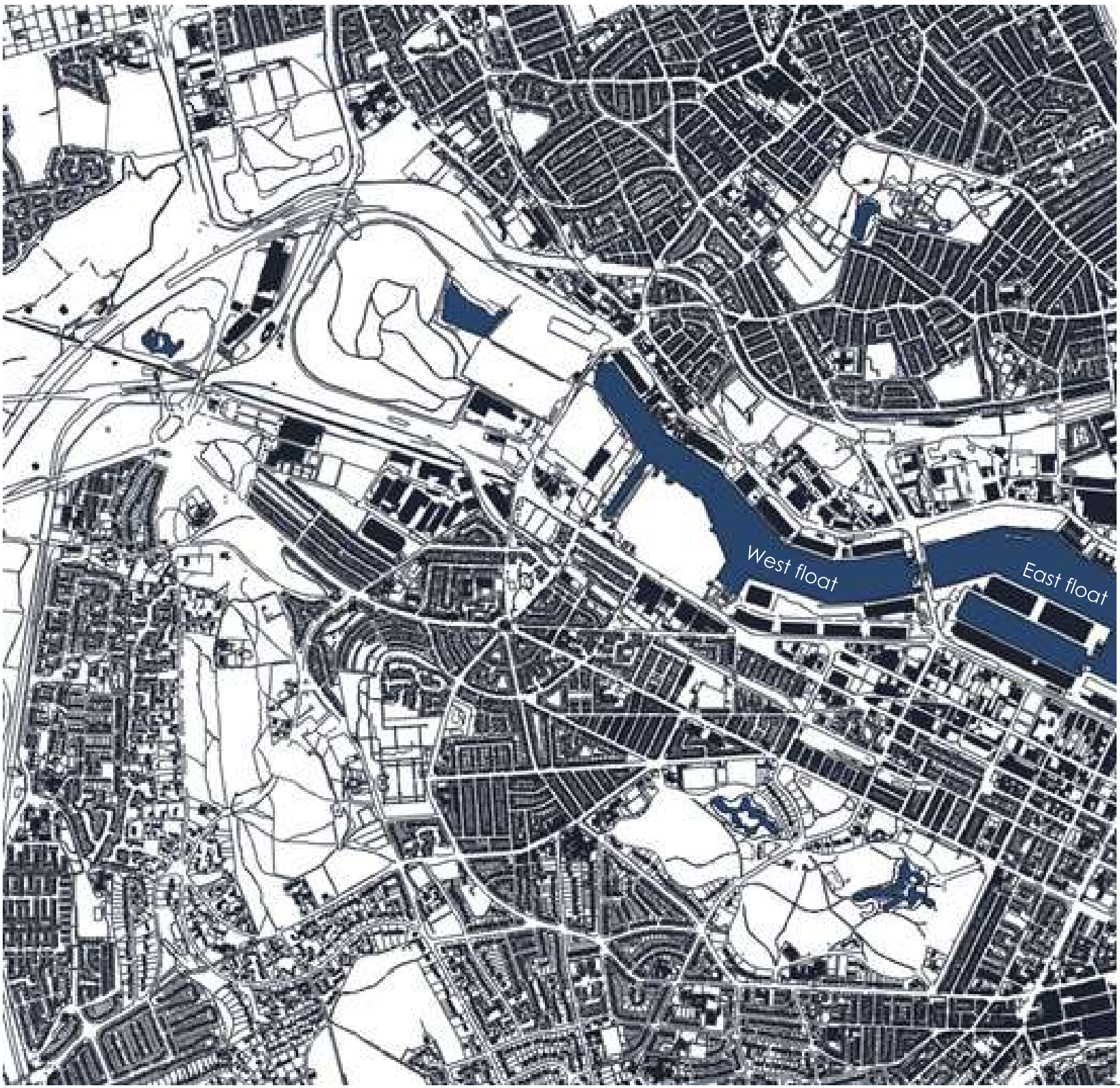
Historically an agricultural area until the 19th century, Wirral saw a shift with Liverpool's growth, attracting Liverpool businessmen to establish residential spaces on parts of the peninsula. In 1824, Birkenhead's shipyards, founded by William Laird, transformed the area, organizing the town on a grid pattern around Hamilton Square. Later in the century the Birkenhead docks attracted trade as a commercial port.

Ferries, road tunnels, and a rail tunnel across the Mersey estuary connect Wirral with the city of Liverpool and the rest of Merseyside. Urban, industrial, and commercial development is concentrated on the northeastern side of the peninsula, along the Mersey, while much of the rest of the borough contains a mix of suburban development, villages, and rich agricultural land

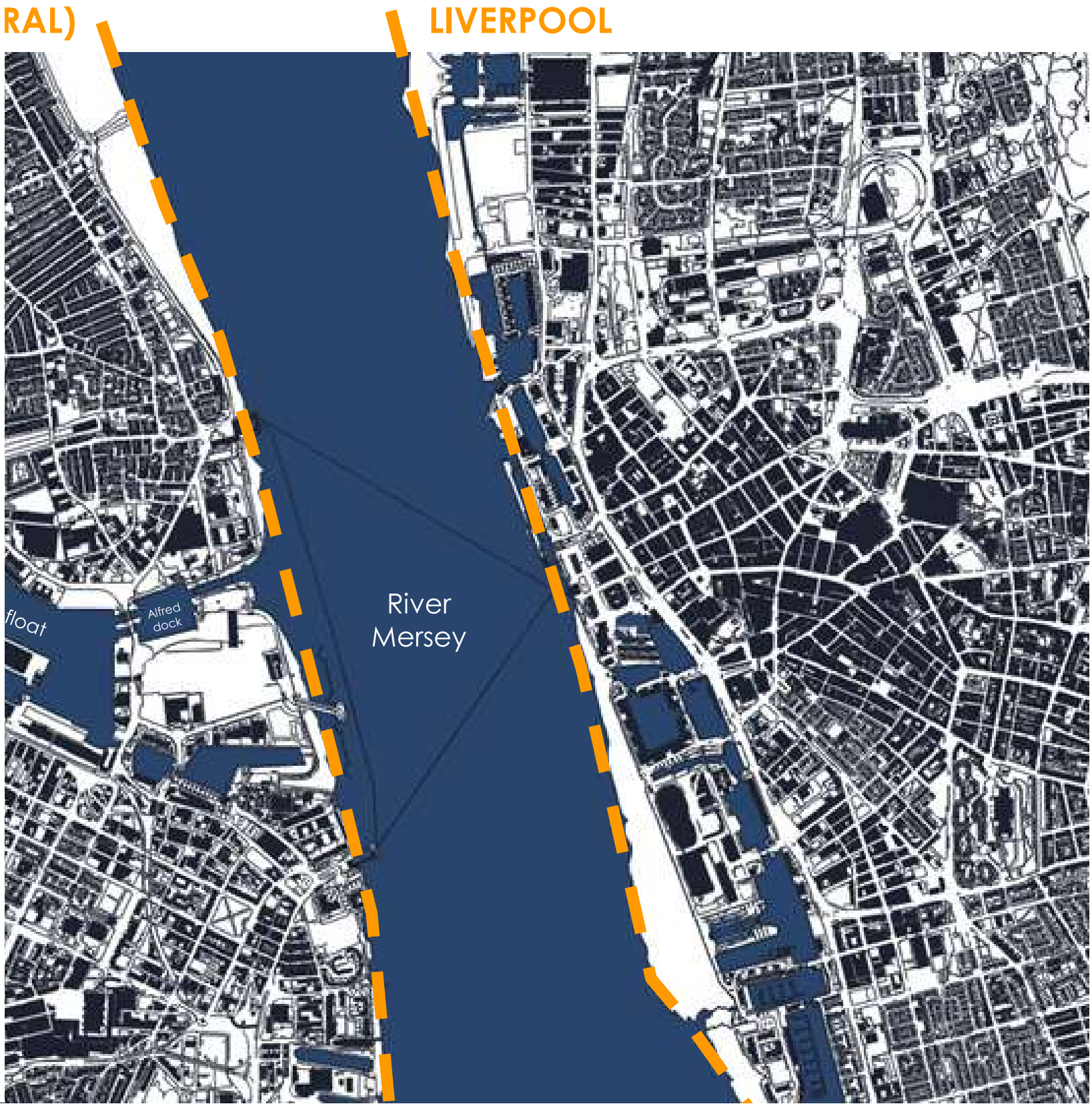

Key
Liverpool City Region
Mersey Dee Alliance
Irish Sea
Sefton
Knowsley
St Helens
Liverpool
Wirral
Halton
Manchester
Manchester Airport
LJL Airport
Cheshire West and Chester
Flintshire Sir y Fflint
Conwy
Crewe
Wrexham Wrecsam
Stoke on-Trent
Gwynedd

Strategic Positioning of Wirral

BIRKENHEAD (WIRRAI



Current Wirral Waters Situation




River Me


Birkenhead Fe
Terminal
River Mersey

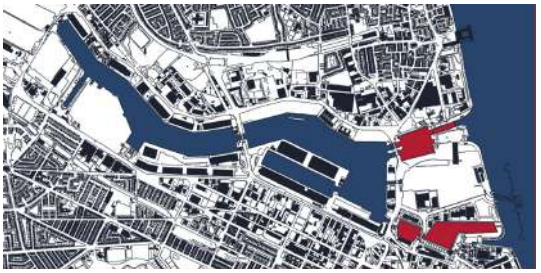
Examination of the Present Situation in Wirral Waters

River Mersey


East float
Alfred Dock

Examination of the Present Situation in Wirral Waters

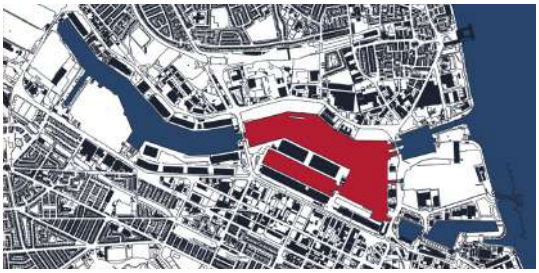
Alfred Dock |Morpeth Dock

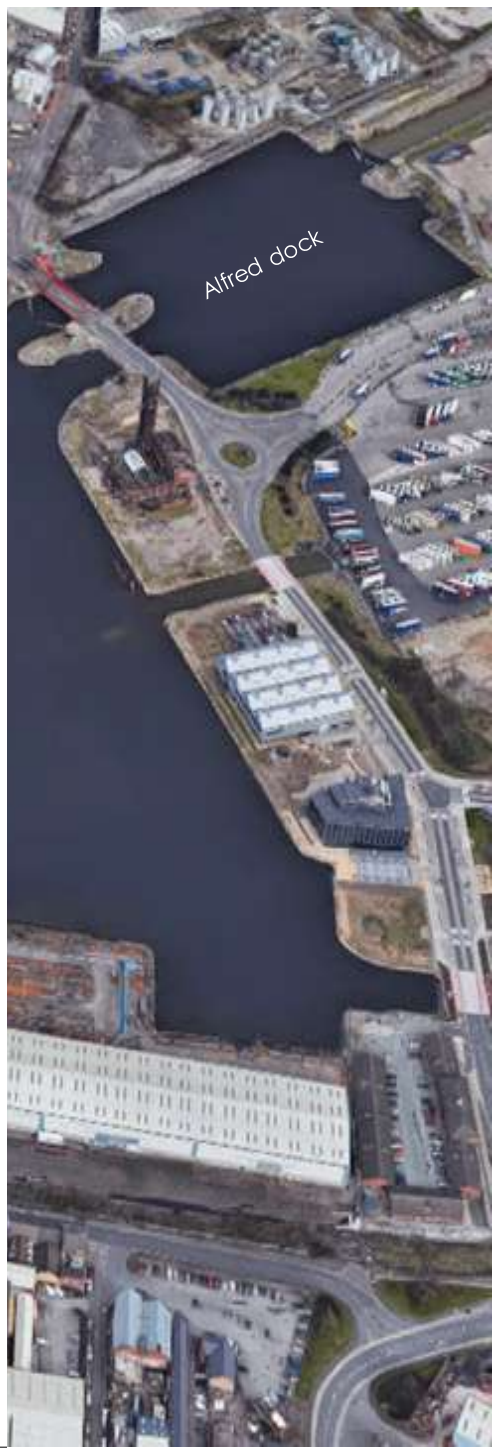


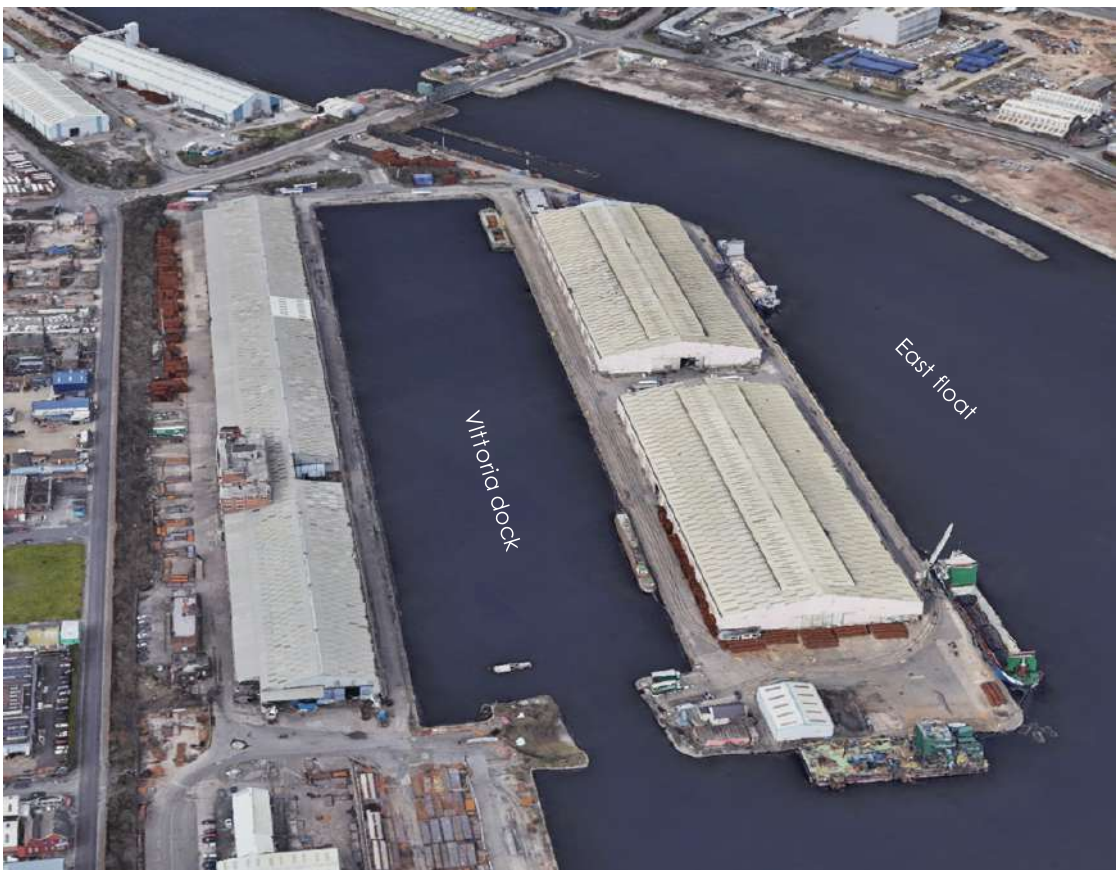

East float
Vittoria dock

Examination of the Present Situation in Wirral Waters

East Float | Vittoria Dock



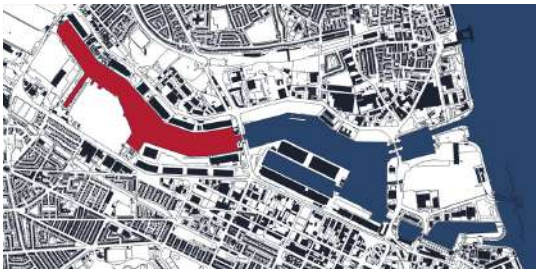


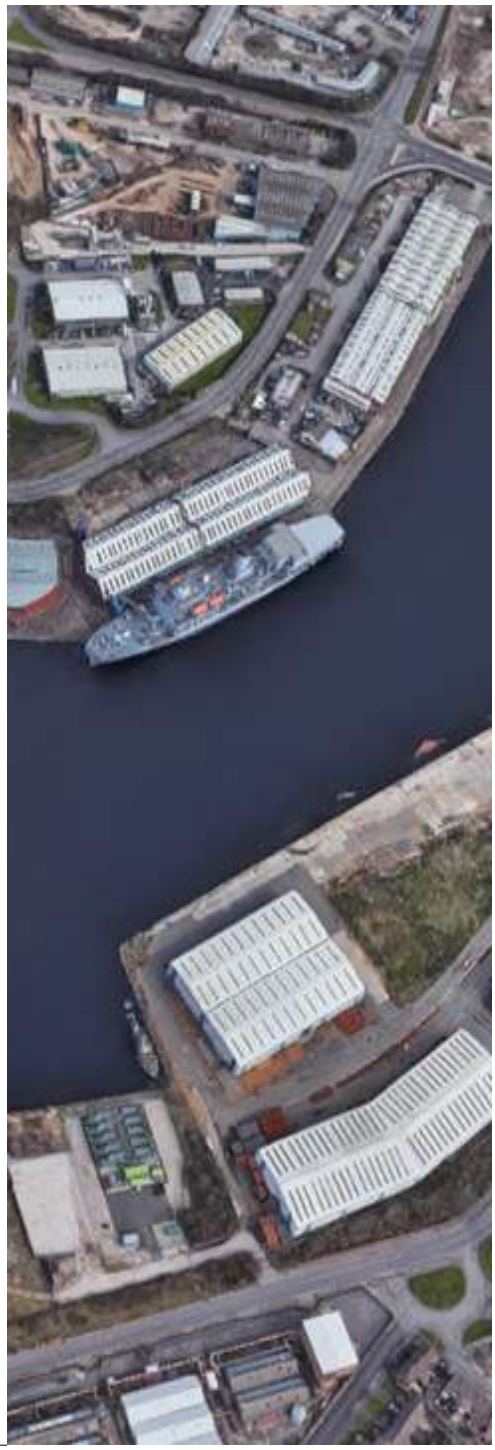


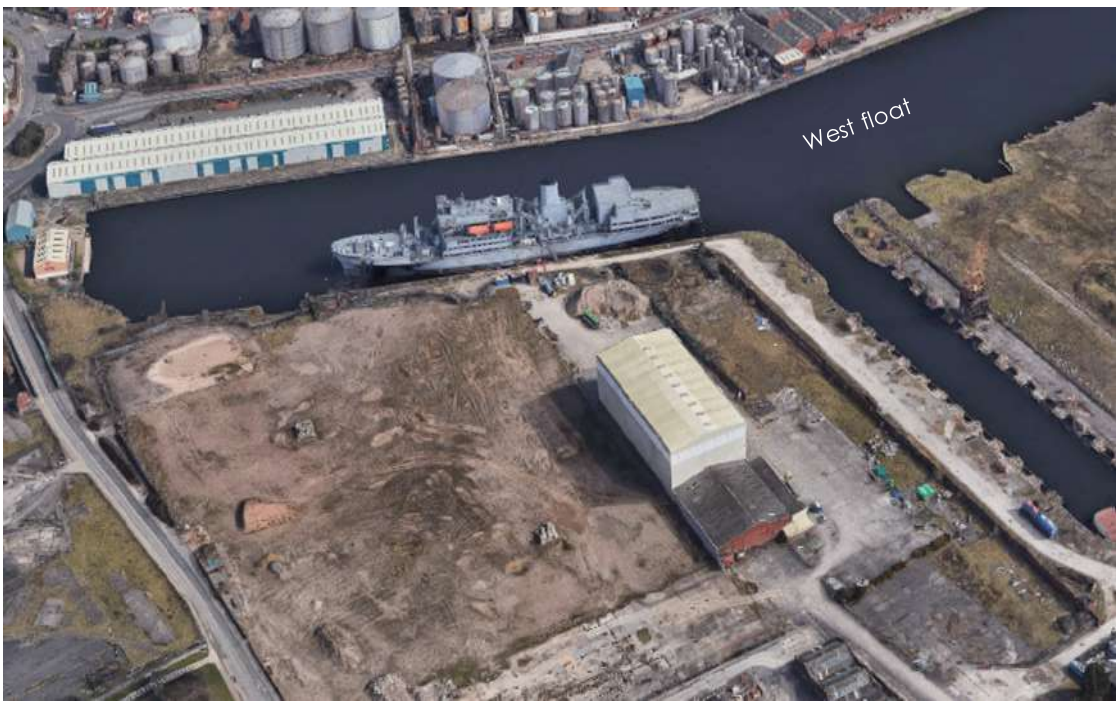

West float

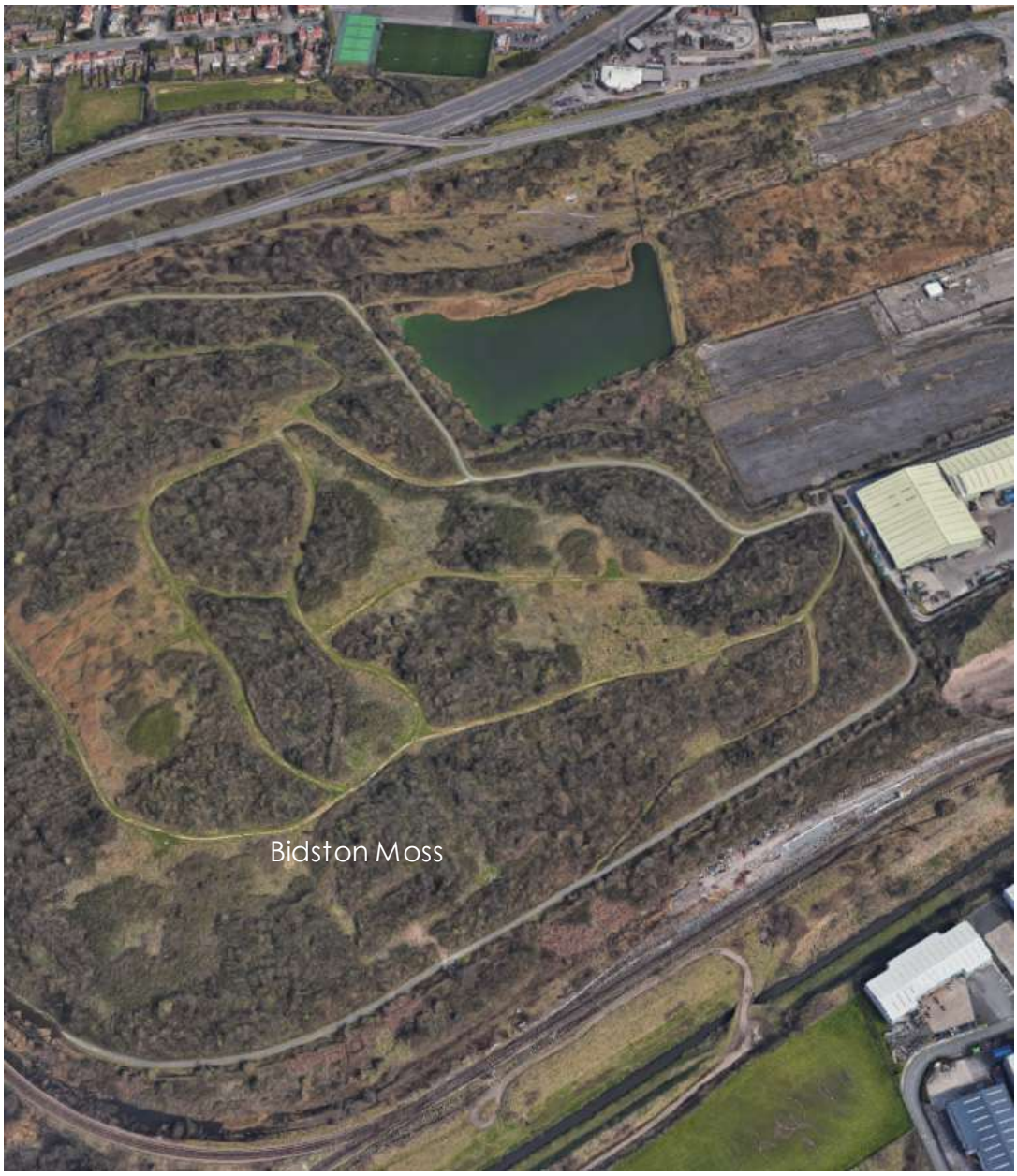
Examination of the Present Situation in Wirral Waters

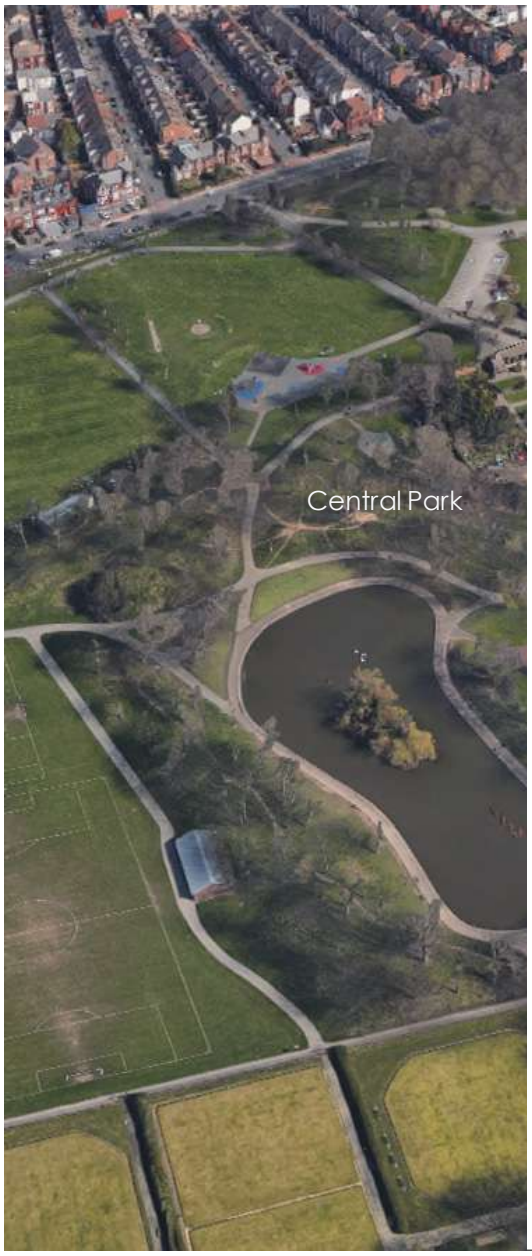
West Float





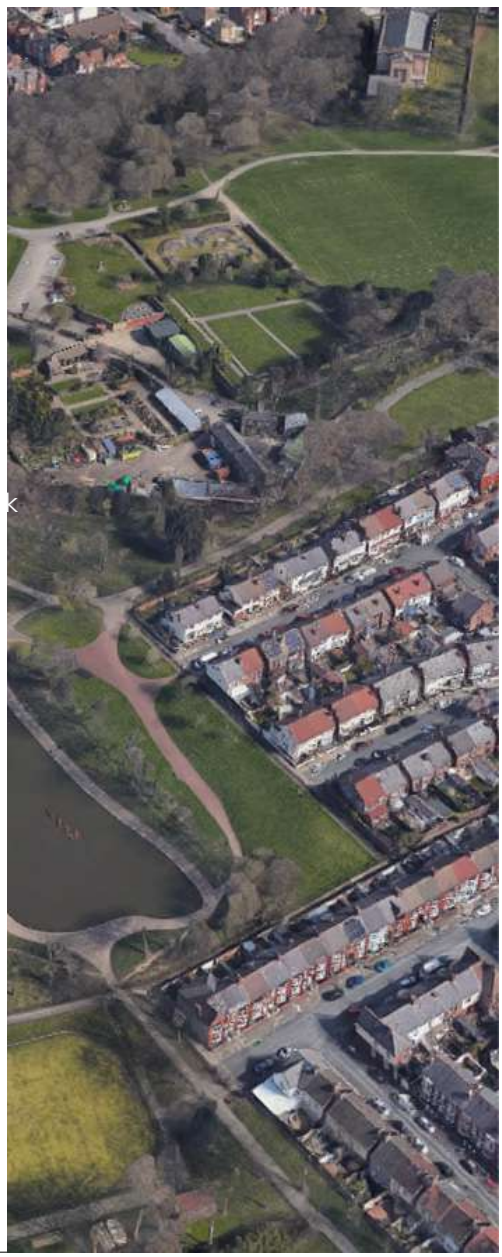


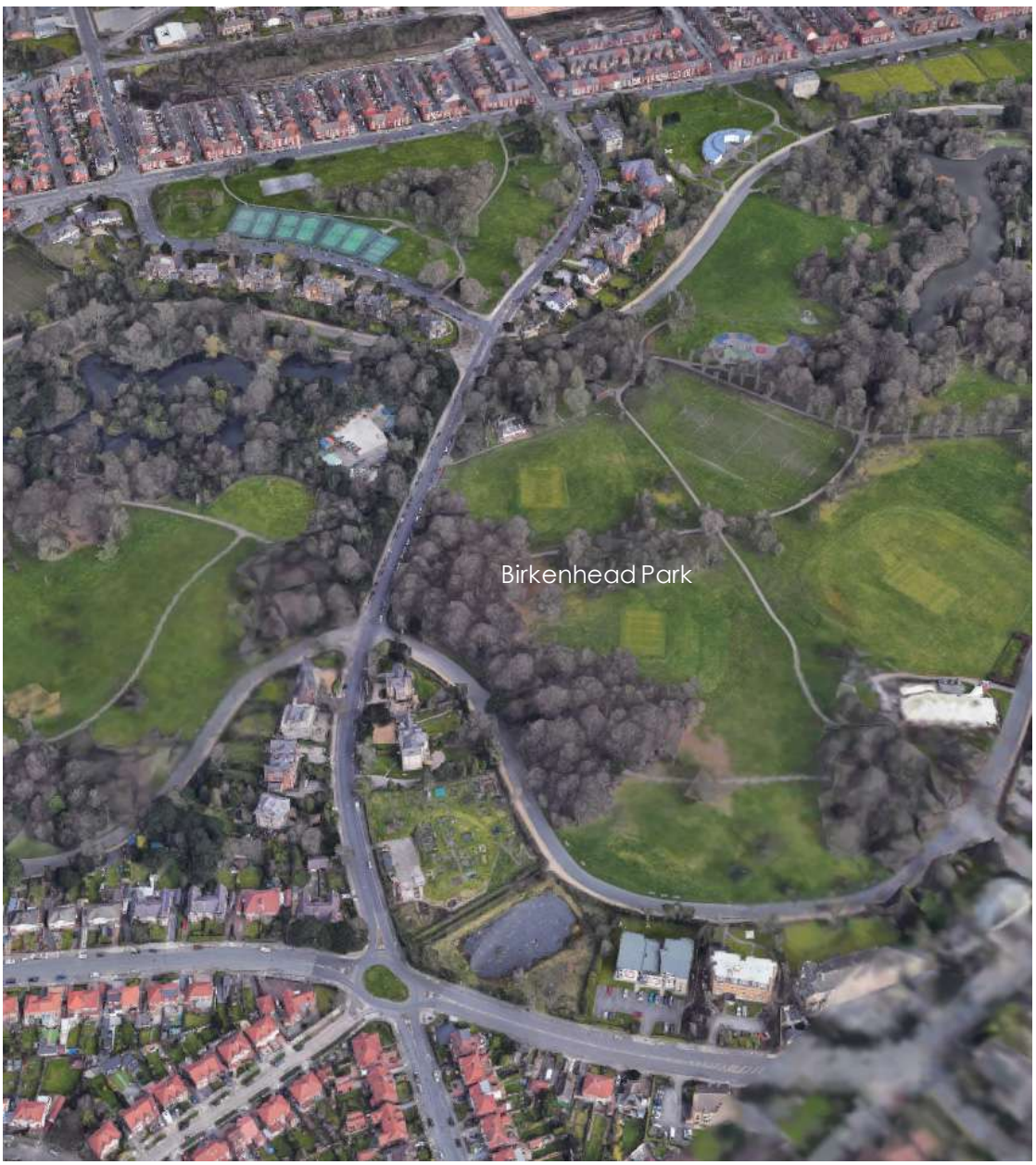

Bidston Moss


Central Park

Examination of the Present Situation in Wirral Waters

Bidstone Moss |Central Park |Birkenhead Park





Wirral's Primary Attraction Areas

General data about Wirral Waters

The Wirral Peninsula is about 24 km long and 11 km wide

The Wirral Peninsula is bounded by the Dee Estuary to the west, the Mersey Estuary to the east, and Liverpool Bay to the north.

Plans were announced in 2006 for a £4.5bn development around the docklands to be called Wirral Waters.

At the north eastern end, the Wirral is joined to Liverpool by three tunnels under the Mersey: two road tunnels, one from Wallasey (Kingsway) and one from Birkenhead (Queensway), and the Mersey Railway tunnel.

Regular Mersey Ferry crossings operate to Liverpool from both Woodside and Seacombe, providing a commuter shuttle and pleasure cruises.

The Great Float consists of 45 ha of water and more than 6 k m of quays.

The Great Float is split into two large docks, East Float and West Float, both part of the Birkenhead Docks complex run approximately 3 km inland from the River Mersey

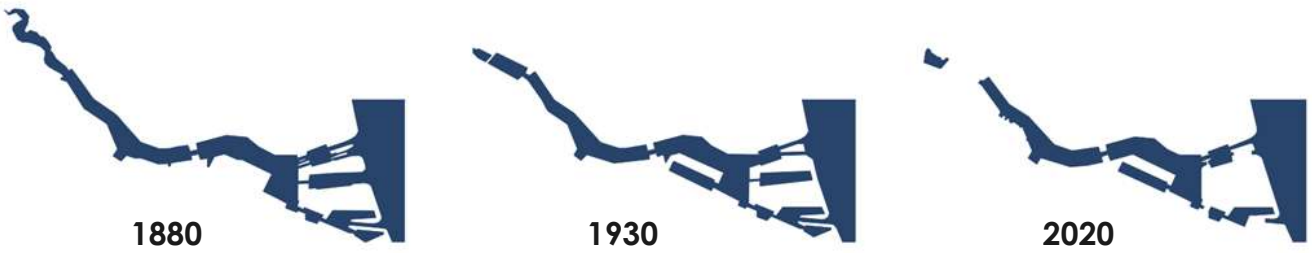
Watersports
Hoylake, in north west Wirral is one of the premier European land sailing (sand yachting) sites.

West Kirby, in north west Wirral has a marine lake for windsurfing, sailing and sea kayaking and hosts the British Open Team Racing Championship (Wilson Trophy) sailing competition

New Brighton is a popular place for jet-skiing as well as for paddle boarding and kitesurfing.

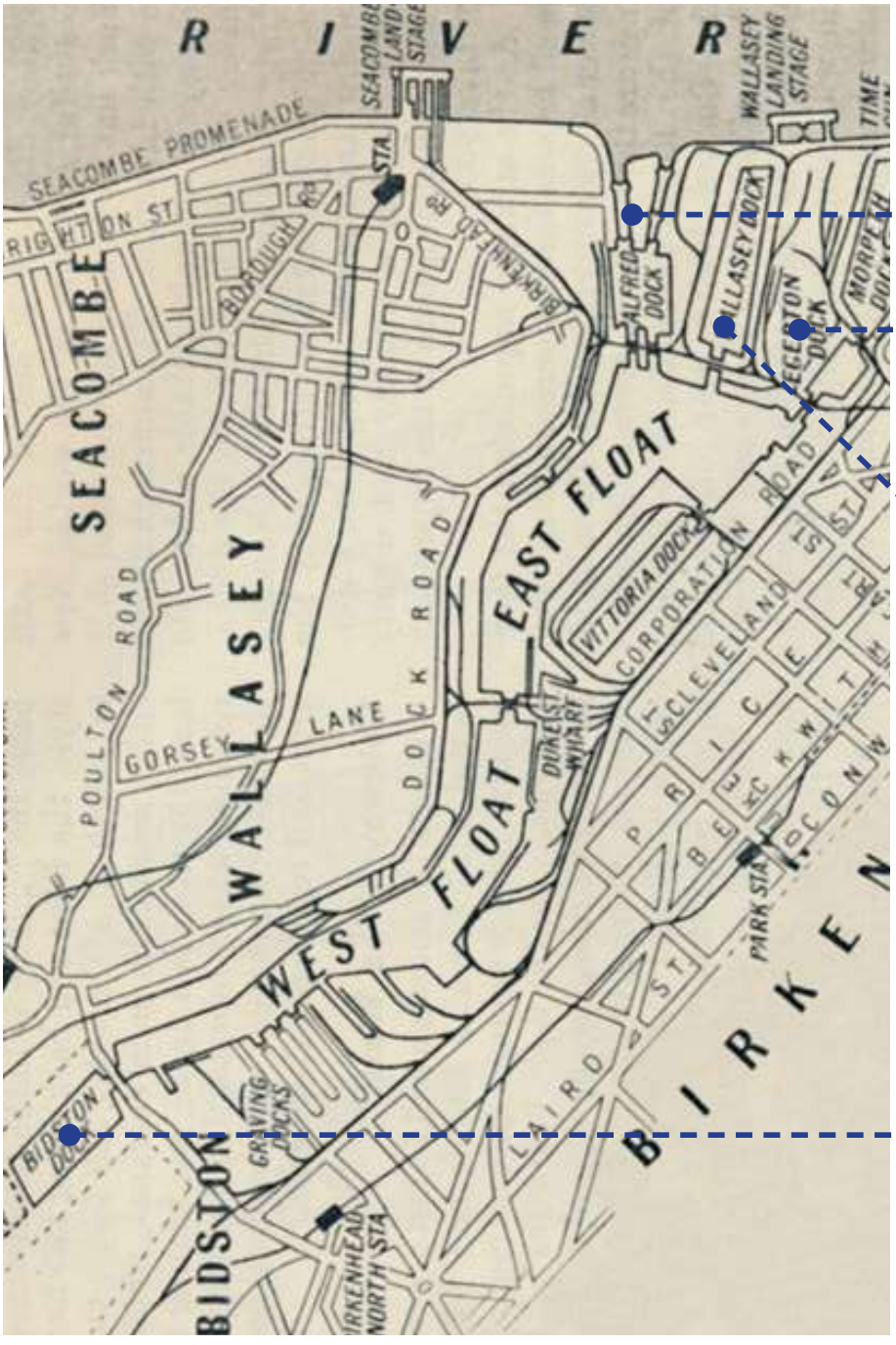
Birkenhead Dock development

The Great Float in Birkenhead, formed in the 19th century, is a significant maritime development in England. It was created by merging the East and West Floats in Wallasey Pool, a natural inlet of the River Mersey, to meet the demands of increasing maritime trade. Officially opened in 1851, it marked Birkenhead's emergence as a major shipbuilding and industrial center. Over time, the Great Float has been integral to the region's economic growth, hosting numerous shipyards and warehouses.



Plan of docks and warehouses proposed to be made at Birkenhead (1844)

The Great Float in 1936 (East & West Floats.y.)



Alfred Dock (opened 1866.y.)
Entrance from/exit to River Mersey

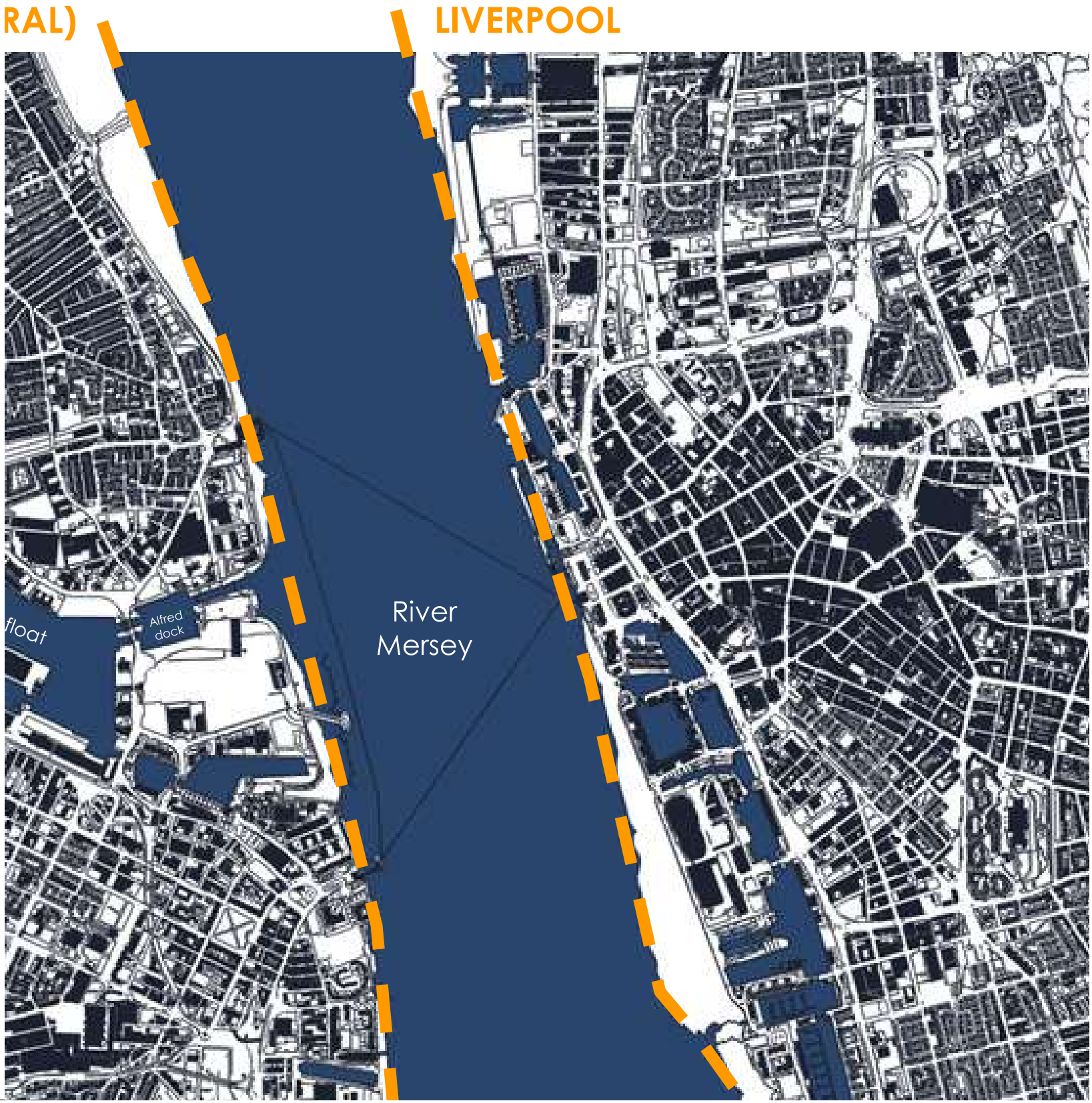
Egerton Dock (opened 1847.y.)
Not used - Passage to Great Float closed.

Wallasey Dock (opened 1877.y.)
2001.y. filled in

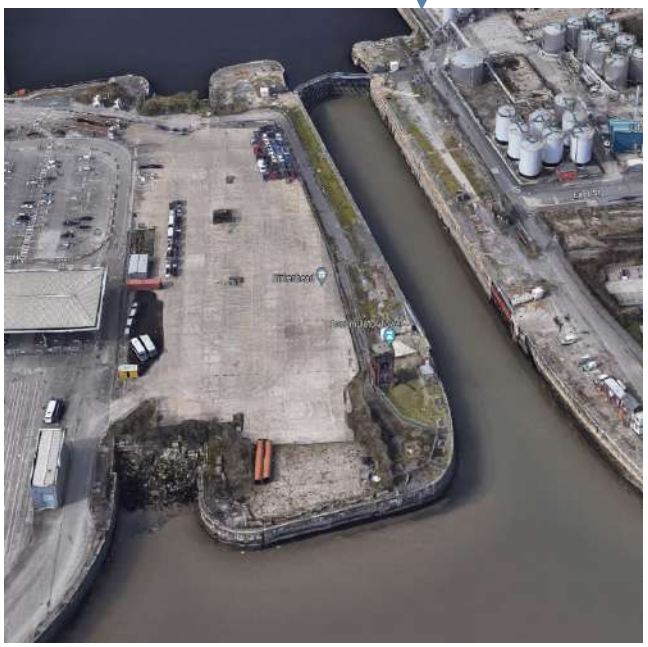
Bidston Dock (opened 1933.y.)
2002-2003.y. filled in

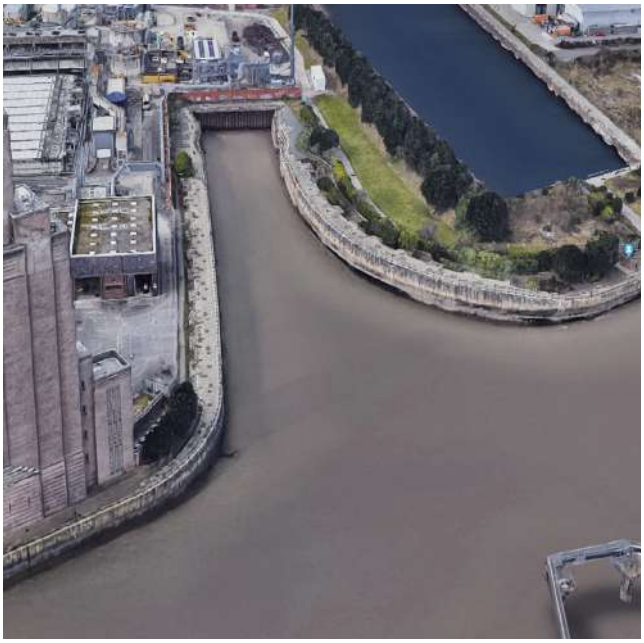
BIRKENHEAD (WIRRAI

Current Wirral Waters Situation

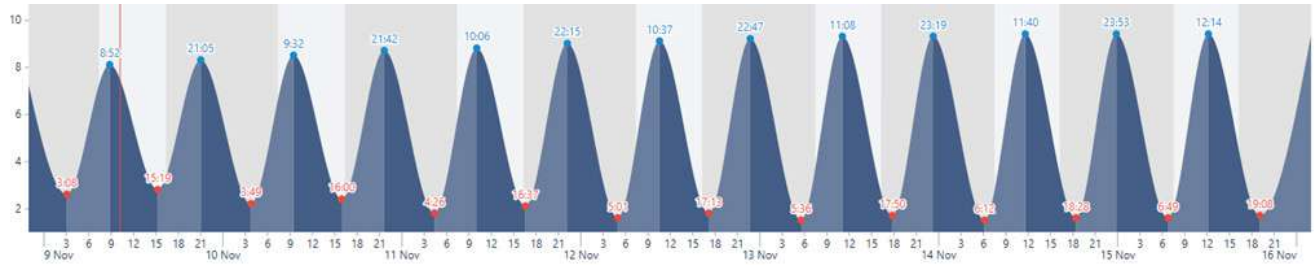



West Float
Belfast - Birkenhead
Mersija





Tide Gates and Tide Characteristics

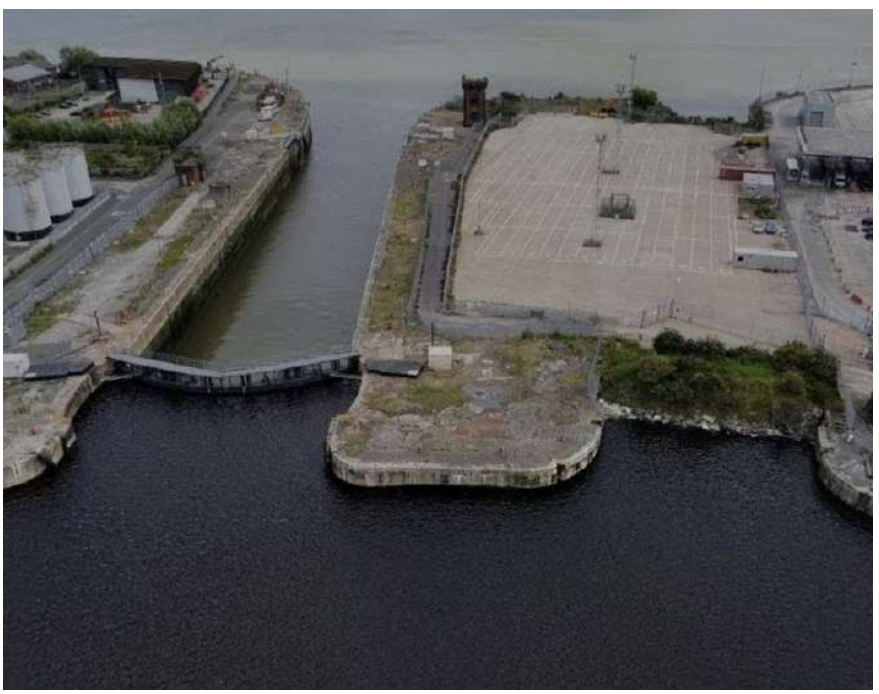


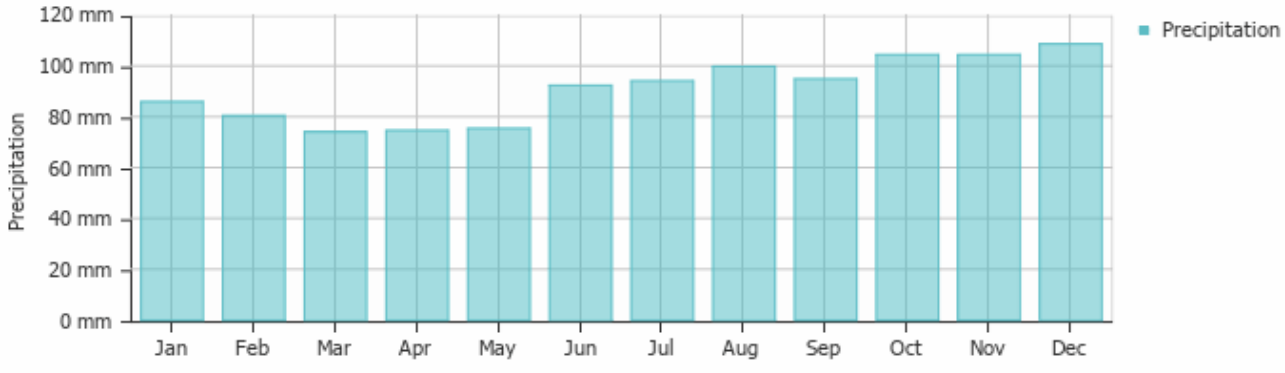
The River Mersey experiences a significant tidal range, with a maximum of 8.2 meters during spring tides and an average of 4.2 meters, while the tidal currents in the Narrows can exceed 2 meters per second at spring tides, with the river flow contributing less than 1% to these tidal flows. In general, tides are caused by the gravitational pull of the moon and sun, leading to regular and predictable changes in sea levels around the world.

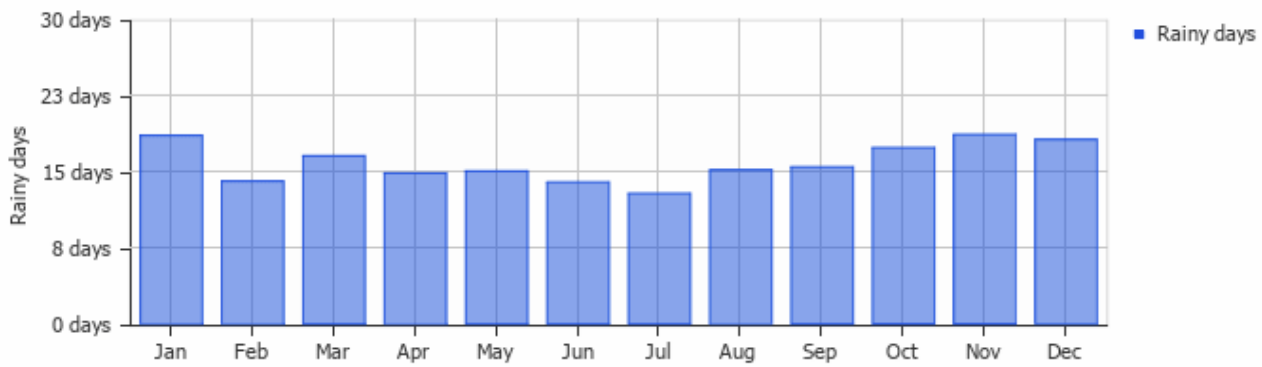
Tide gates operate by allowing water to flow in one direction and blocking it in the opposite, thus stabilizing water levels in areas such as docks and harbors. As tides fluctuate, these gates open to release excess water during high tides and close to stop seawater intrusion during low tides, ensuring consistent water levels in dock areas.

Water types

The River Mersey is significantly influenced by tidal movements, resulting in its waters being less clean and more turbid, a common characteristic of tidal rivers.
In contrast, the waters at the Wirral Docks are characterized by being more stationary, leading to clearer water that is typically free from the mud and silt.
Despite both the River Mersey and Wirral Docks being prominent water bodies, their different water dynamics - the tidal influences on the Mersey and the tranquil waters of the docks - result in varying conditions in terms of water clarity and sediment content.

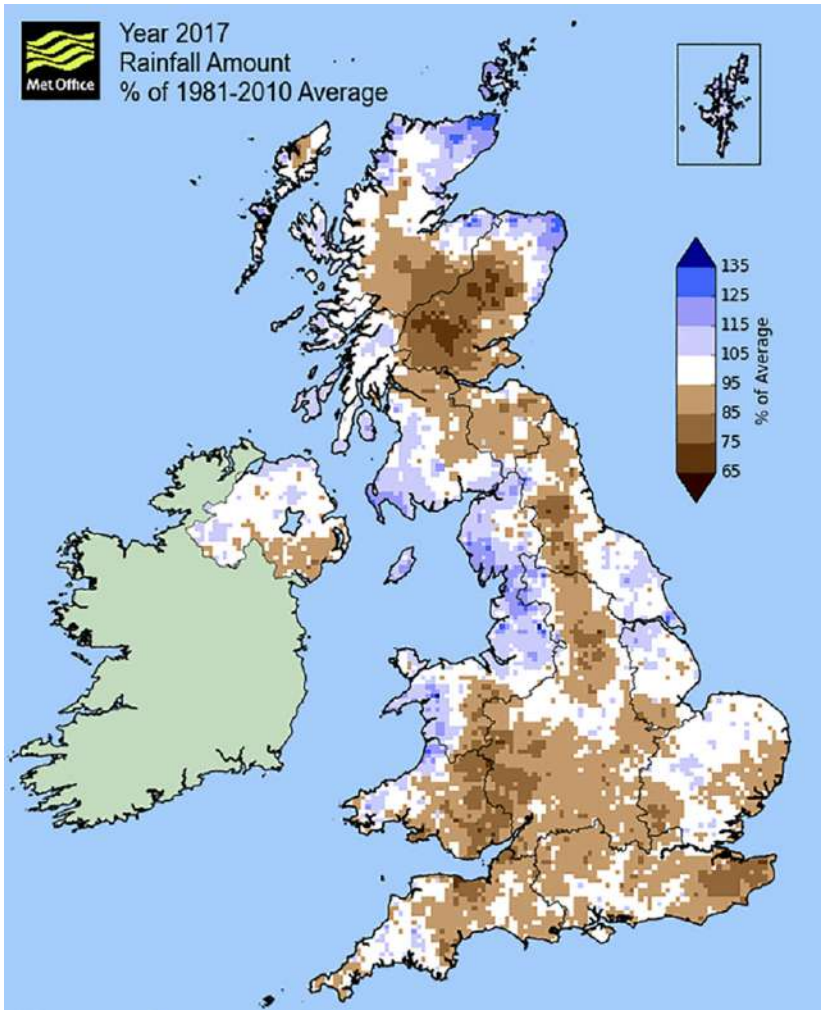






Rainy days/year Birkenhead 2020

Climate Conditions (Weather/Rain) in Birkenhead



In Birkenhead, UK, the weather is characterized by a temperate maritime climate, which means the area experiences relatively cool summers and mild winters. Rainfall is fairly distributed throughout the year, with no distinct dry season, making Birkenhead generally moist and often cloudy. The proximity to the coast can influence local weather patterns, leading to occasional heavy rain events, especially during the autumn and winter months.

Sea level - 1m

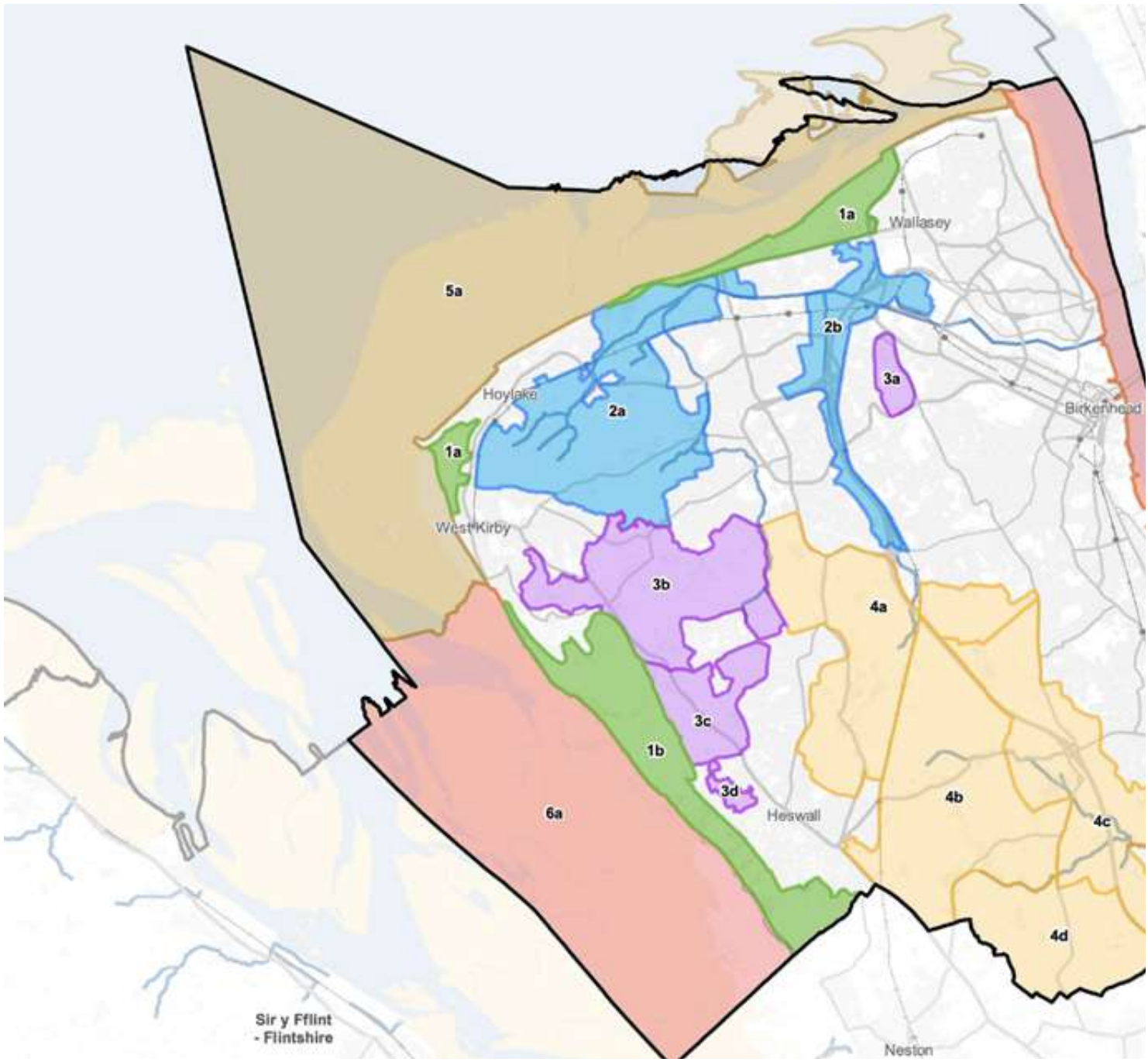
Sea level - 2m

Projected Impacts of Sea Level Rise

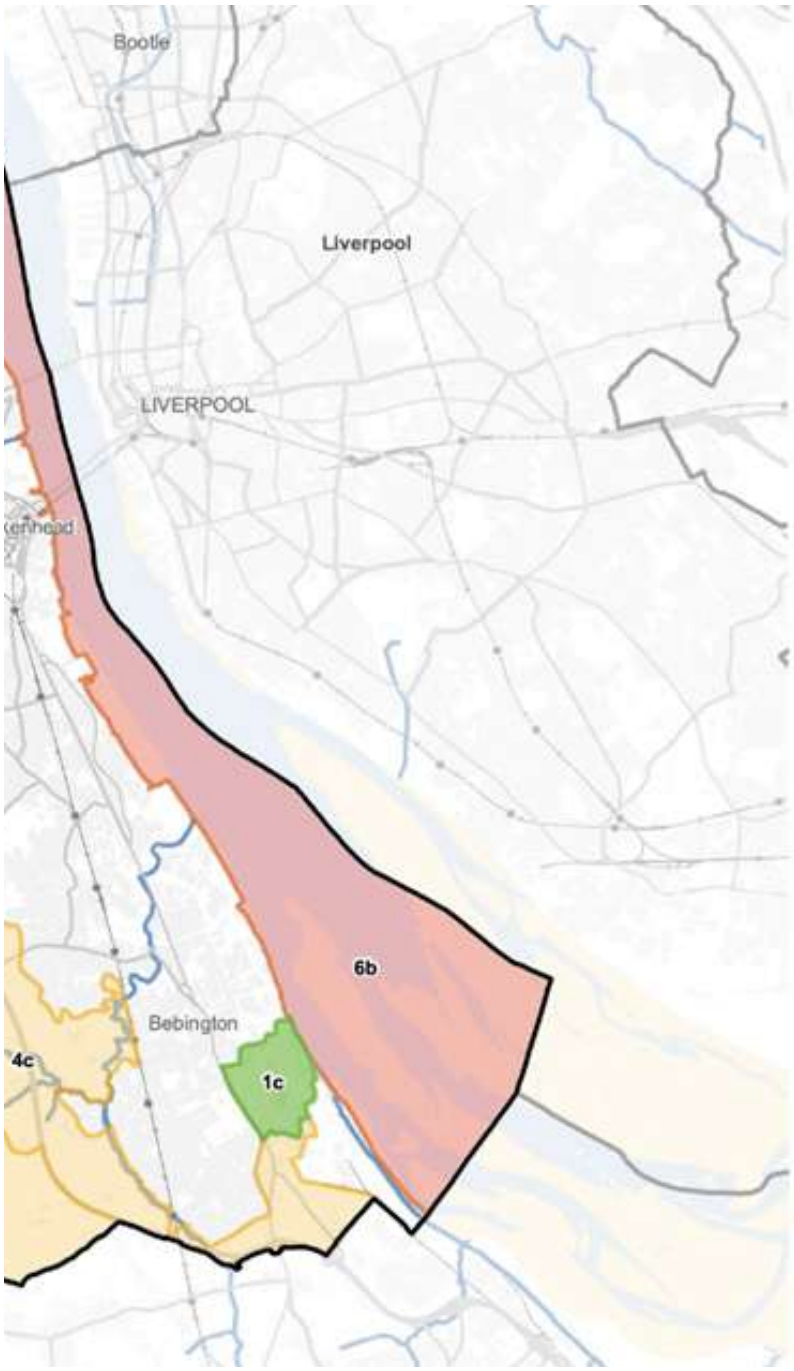
As sea levels continue to rise due to climate change, Birkenhead faces an increased risk of coastal flooding, which could significantly affect residential areas and local infrastructure along the Mersey River estuary.
The historic town of Birkenhead, known for its maritime heritage, could see its iconic landmarks and docks threatened by higher tides, necessitating adaptive measures such as enhanced sea defenses and flood management systems.
Rising sea levels may also lead to ecological shifts in the surrounding areas of Birkenhead, potentially altering the natural habitats along the Wirral Peninsula and impacting local biodiversity.

Sea level - 3m

Source: https://coastal.climatecentral.org/


1a
Wallasey
5a
2b
3a
Hoylake
2a
Birkenhead
1a
West Kirby
3b
4a
3c
1b
3d
4b
6a
Heswall
4c
4d
Sir y Fflint
- Flintshire
Neston

Landscape and seascape (floodplains)



Wirral Green Infrastructure Strategy
Wirral Borough Council

LUC

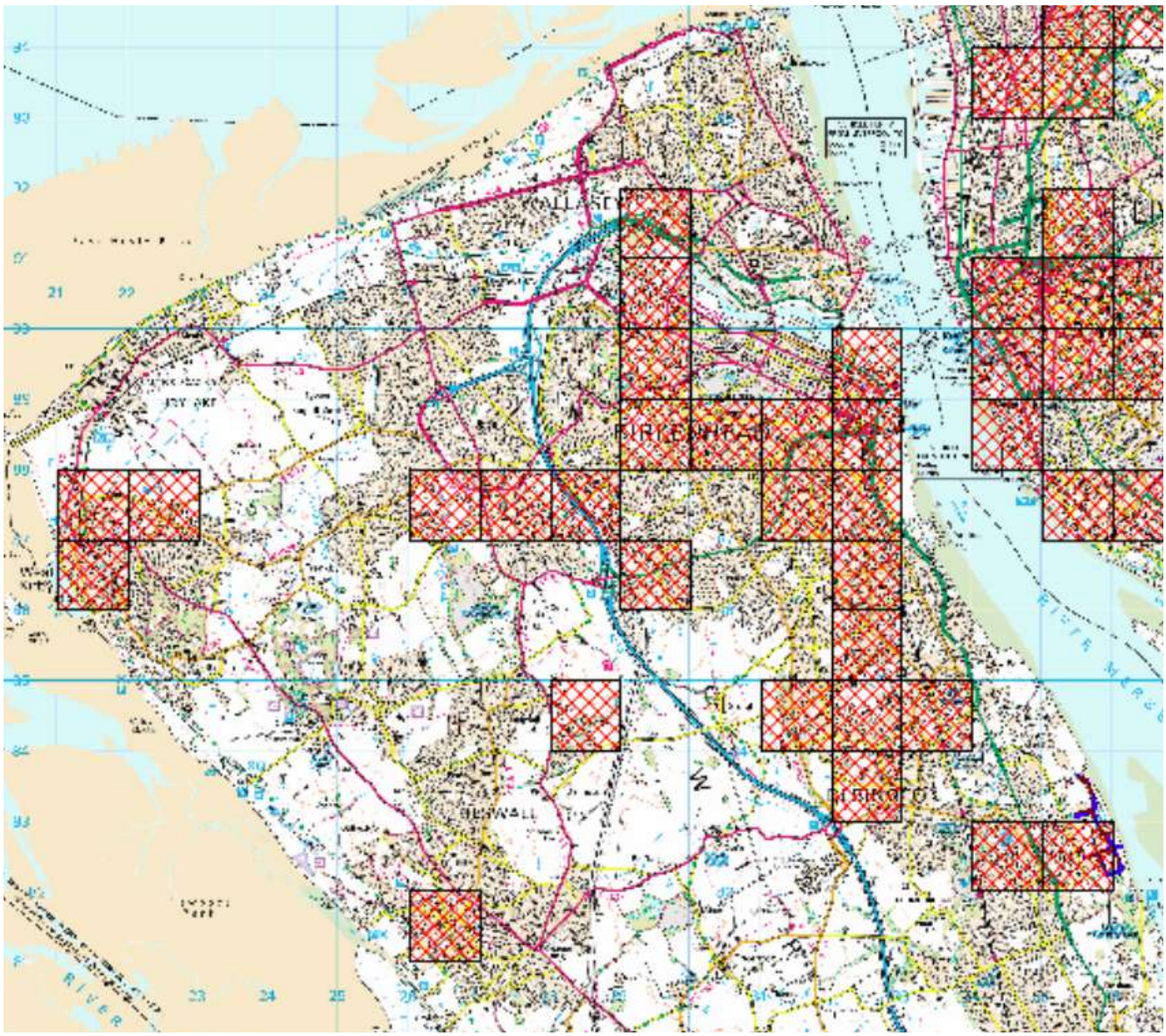
Theme 4: Landscape and Seascape

Wirral Borough boundary

Landscape character areas

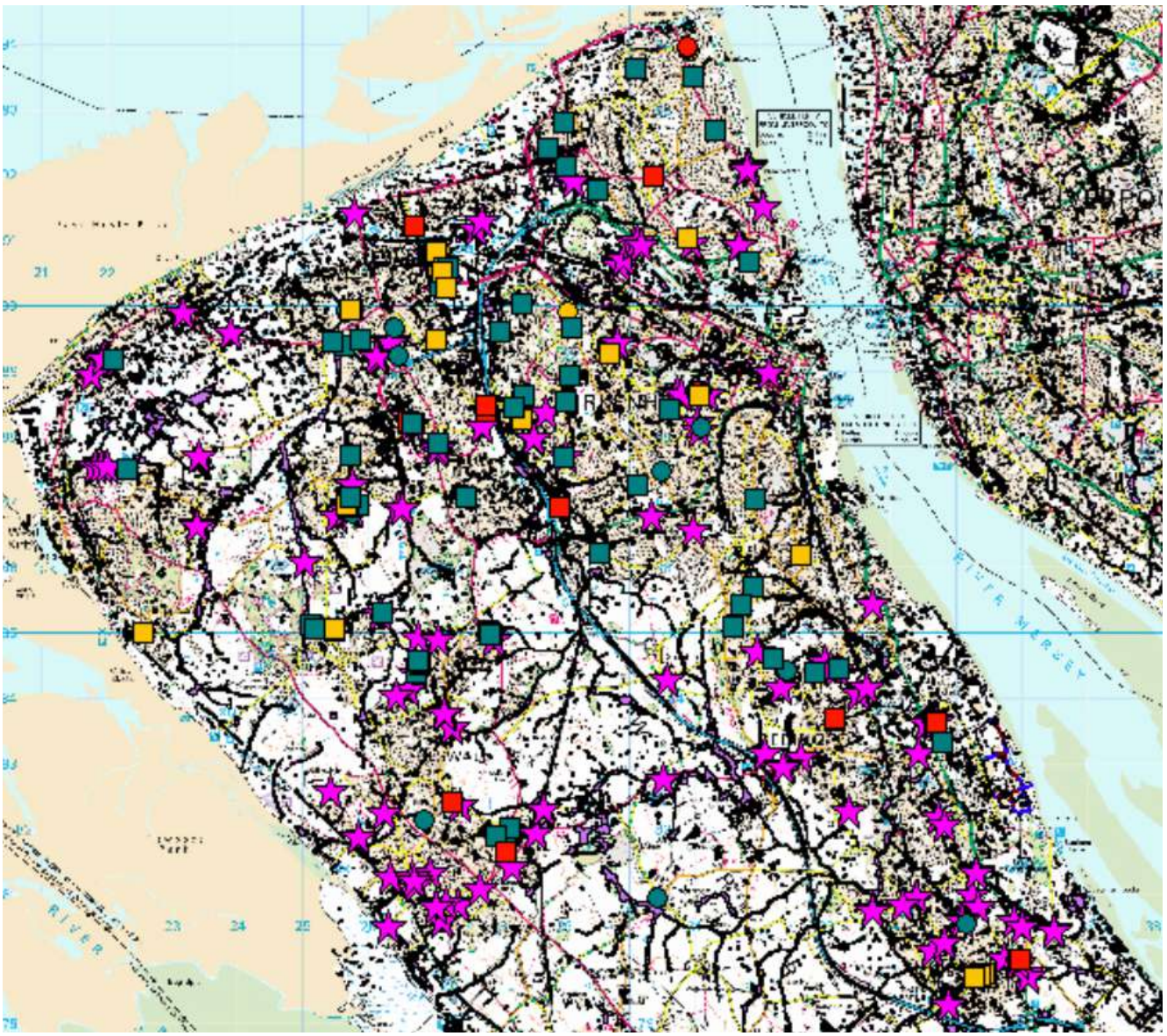
1: Coastal / Estuarine Edge
1a: North Wirral Coastal Edge
1b: Dee Estuarine Edge
1c: Eastham Estuarine Edge
2: River Floodplains
2a: The Birket River Floodplain
2b: The Fender River Floodplain
3: Sandstone Hills
3a: Bidston Sandstone Hills
3b: Thurstaston and Greasby Sandstone Hills
3c: Irby and Pensby Sandstone Hills
3d: Heswall Dales Sandstone Hills
4: Lowland Farmland and Estates
4a: Landican and Thingwall Lowland Farmland
4b: Thornton Hough Lowland Farmland and Estates
4c: Clatterbrook and Dibben Valley Lowland
4d: Raby Lowland Farmland and Estates
5: Coastal Waters
5a: North Wirral Foreshore and Coastal Waters
6: Estuaries
6a: Dee Estuary
6b: Mersey Estuary
Waterways

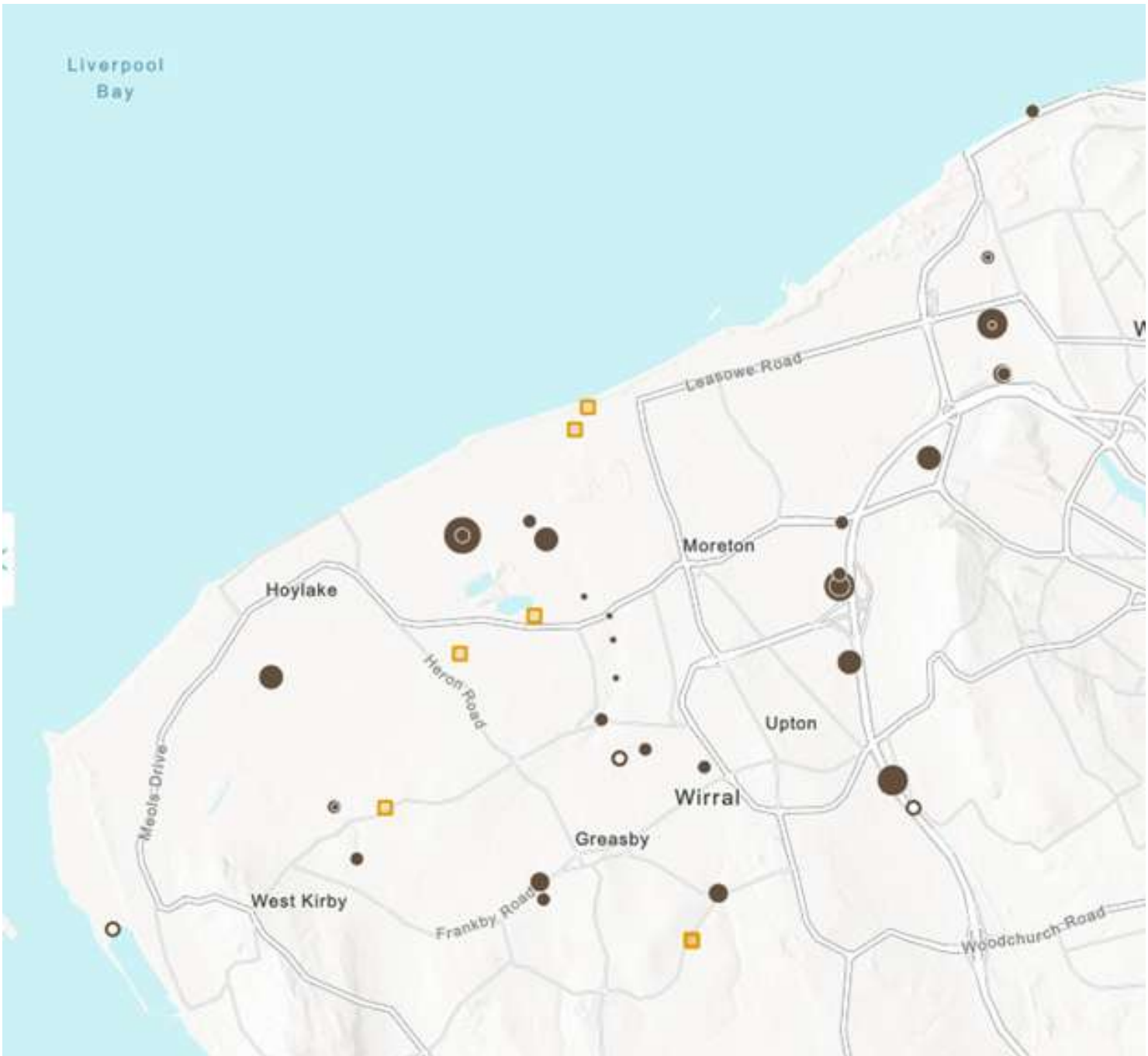
Areas where Future Local Flood Risk May be an Issue



Preliminary Flood Risk (2017.y.)

Flood Map for Surface Water with Historical Flood Locations Overlaid

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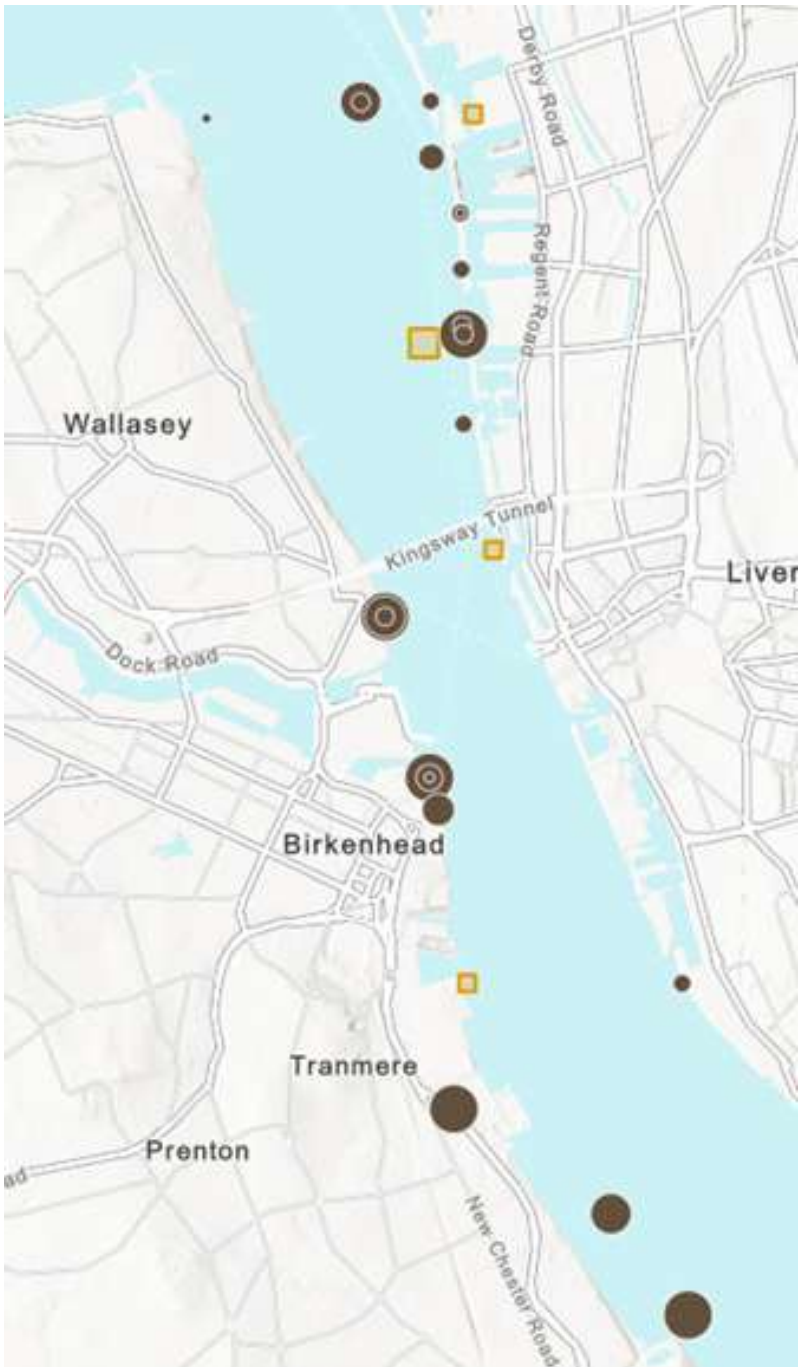
Bay
Leasowe Road
Moreton
Hoylake
Heron Road
Upton
Meols Drive
Wirral
Greasby
West Kirby
Frankby Road
Woodchurch Road

Sewer storm overflow scheme



Map shows where the sewerage network discharges treated sewage and overflows of untreated sewage and storm water into rivers in England & Wales (2022. y.)

Storm overflows with Event Duration Monitoring

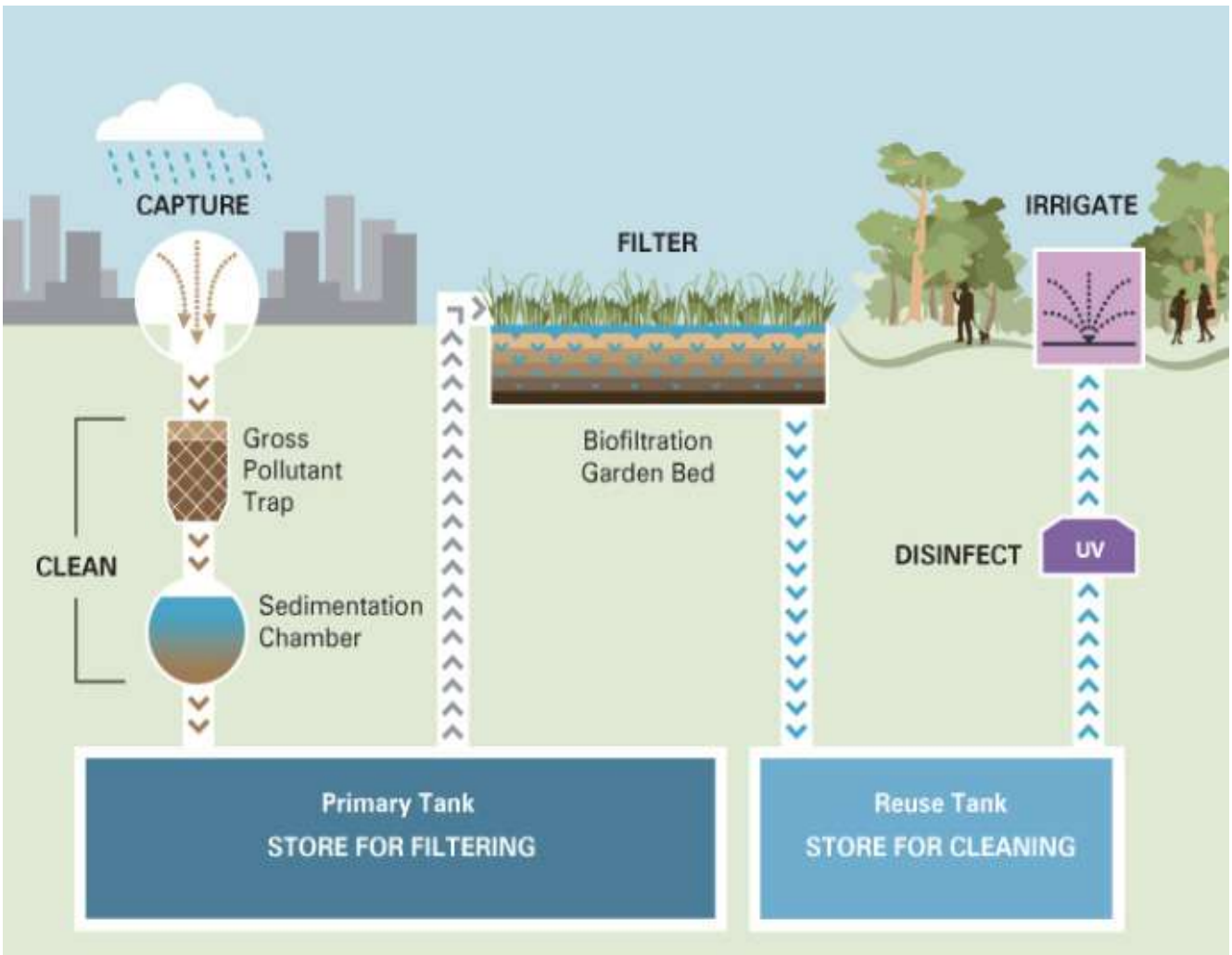
Counted spills using 12-24h counting method

- > 99 - 366
- > 59 - 99
- > 39 - 59
- > 19 - 39
- > 0 - 19
- 0

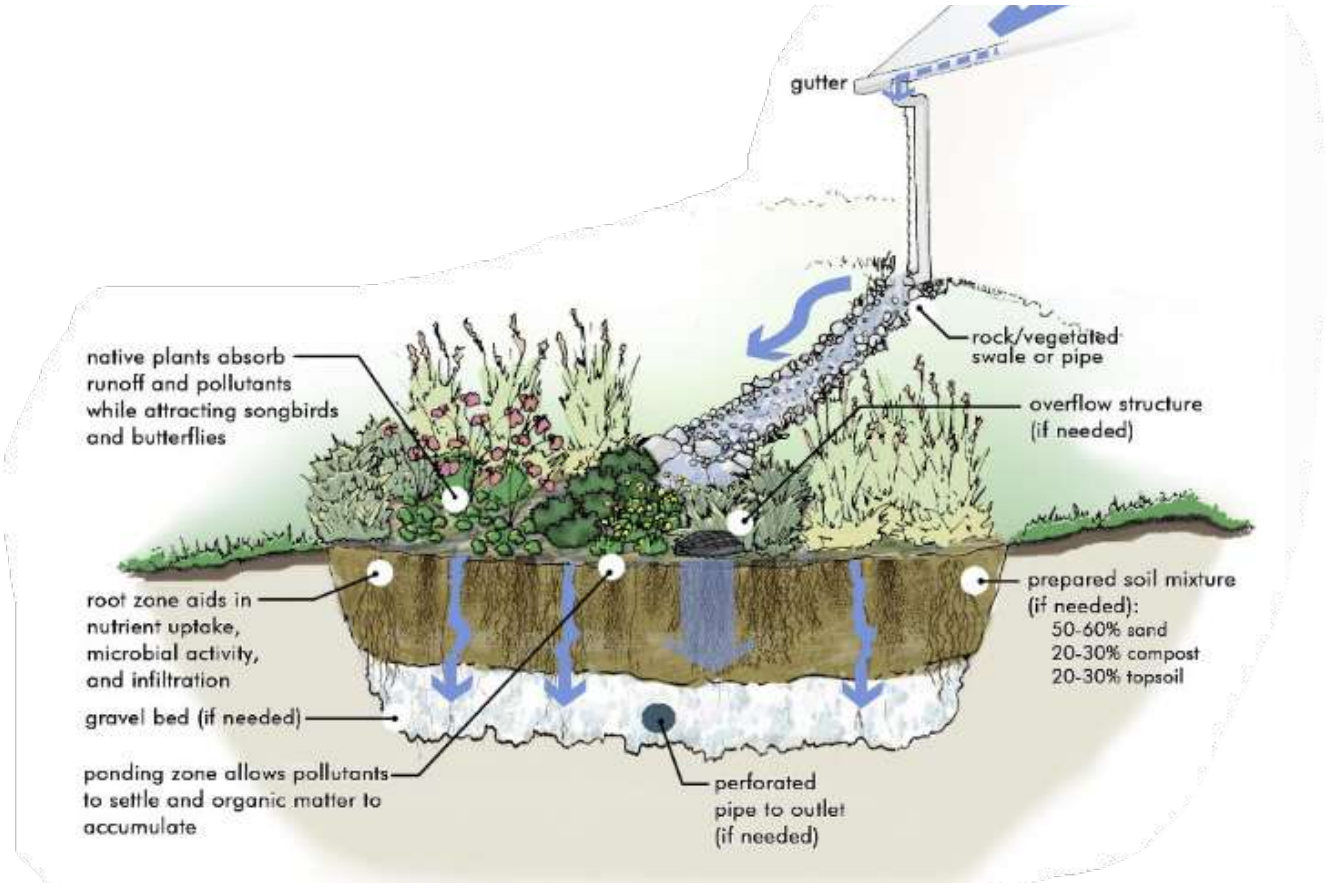
Storm overflows without Event Duration Monitoring

Treated sewage discharges

- Water company
- Not water company

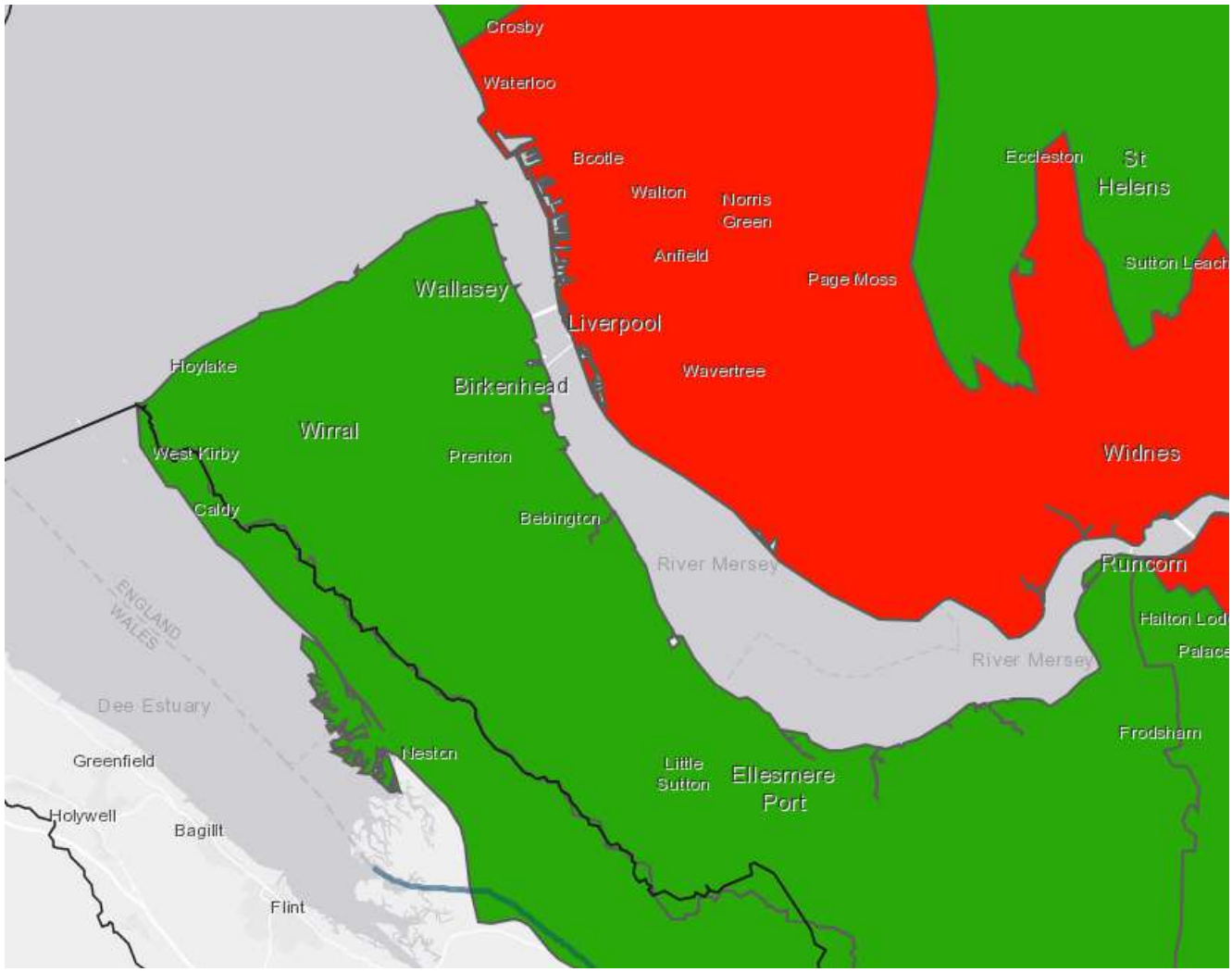

CAPTURE
FILTER
IRRIGATE
Gross
Pollutant
Trap
Biofiltration
Garden Bed
CLEAN
DISINFECT
UV
Sedimentation
Chamber
Primary Tank
STORE FOR FILTERING
Reuse Tank
STORE FOR CLEANING

Strategies for Rainwater Harvesting



Rainwater harvesting is a sustainable practice where rainwater is collected from roofs or other surfaces, then stored for future use, often in tanks. This method is beneficial for cities as it reduces the demand on municipal water supply, helps in managing stormwater runoff, and ensures a supplementary water source during dry periods, contributing to water conservation and environmental sustainability.

Quantitative status



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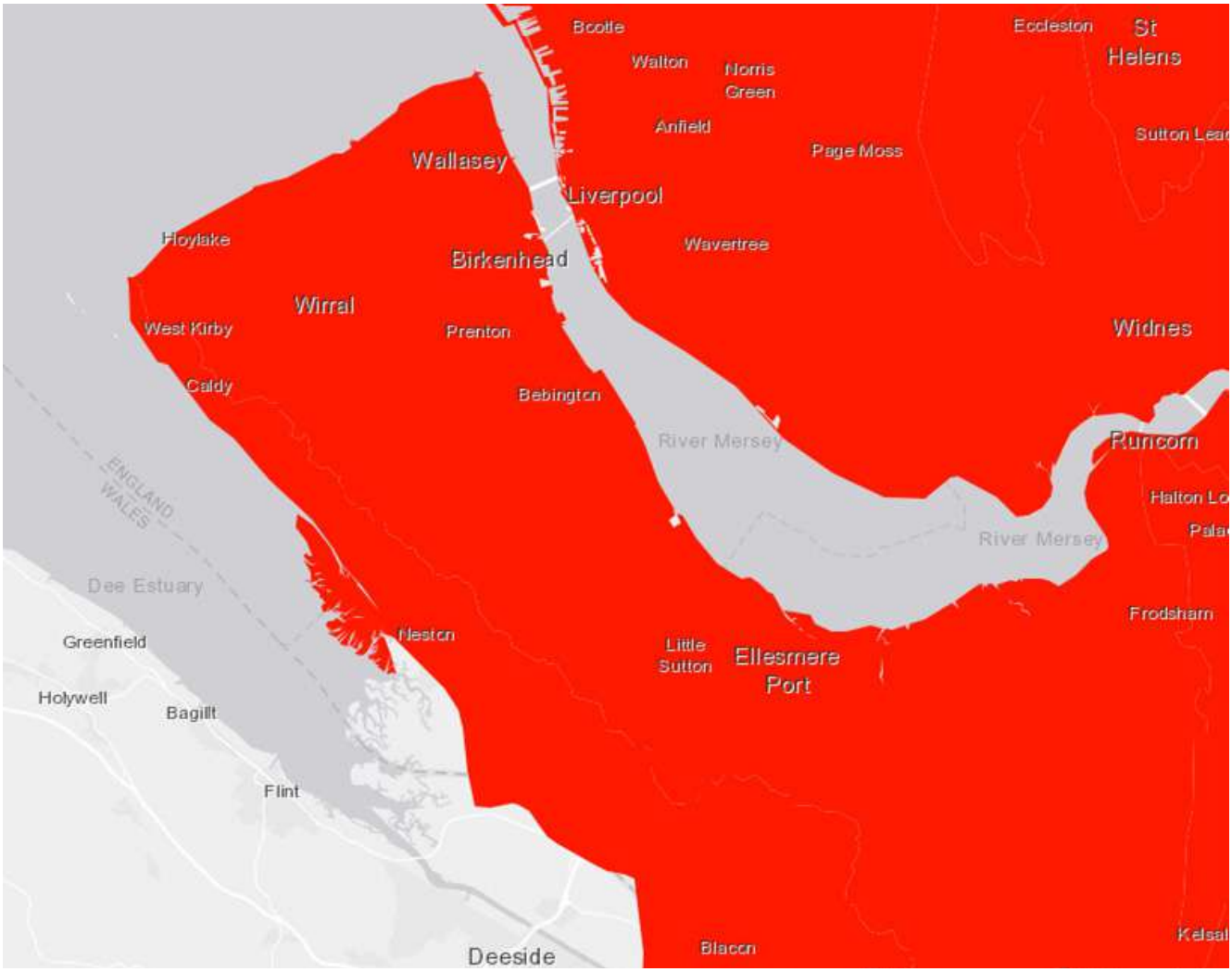
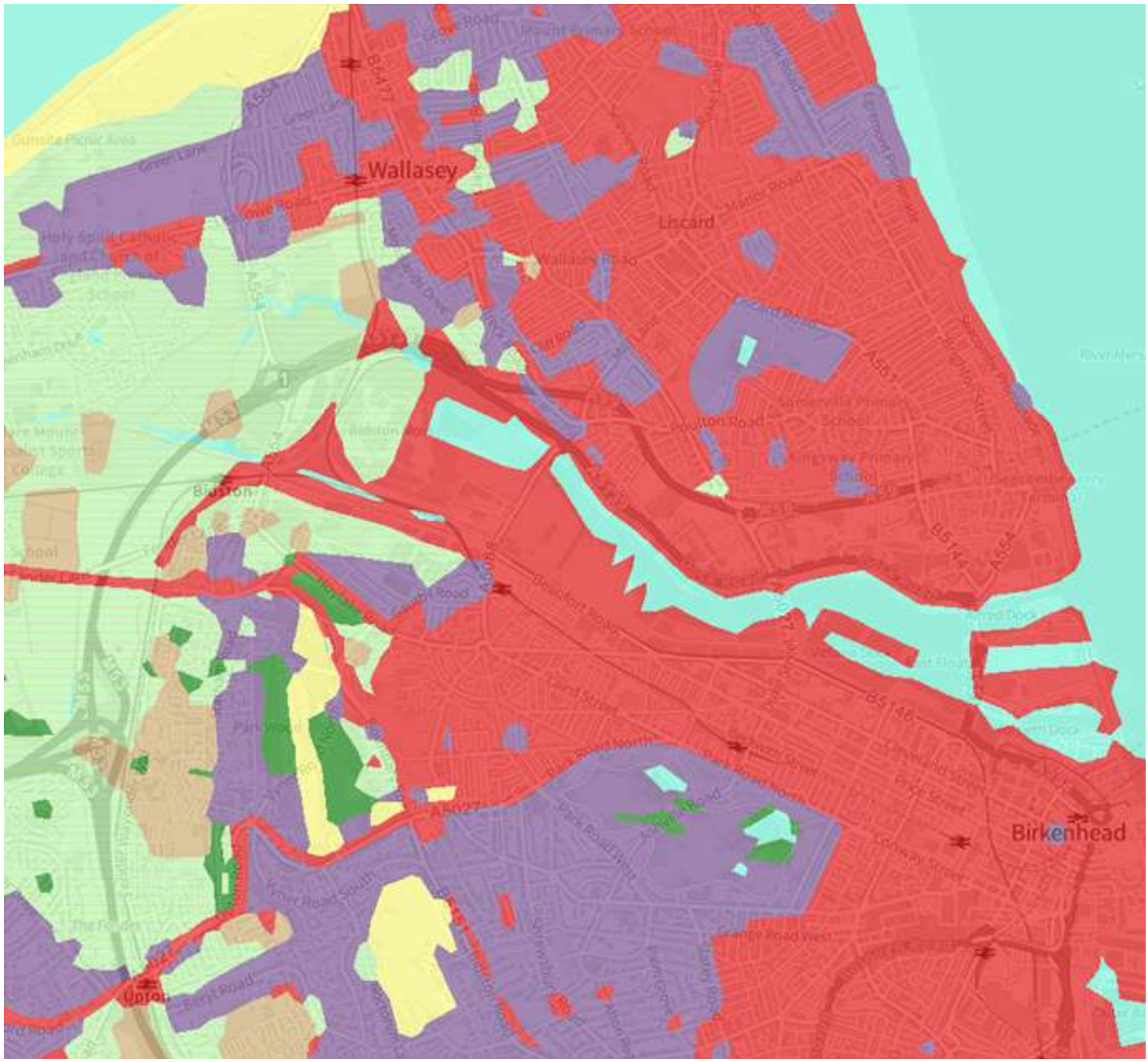
Groundwater

Chemical status



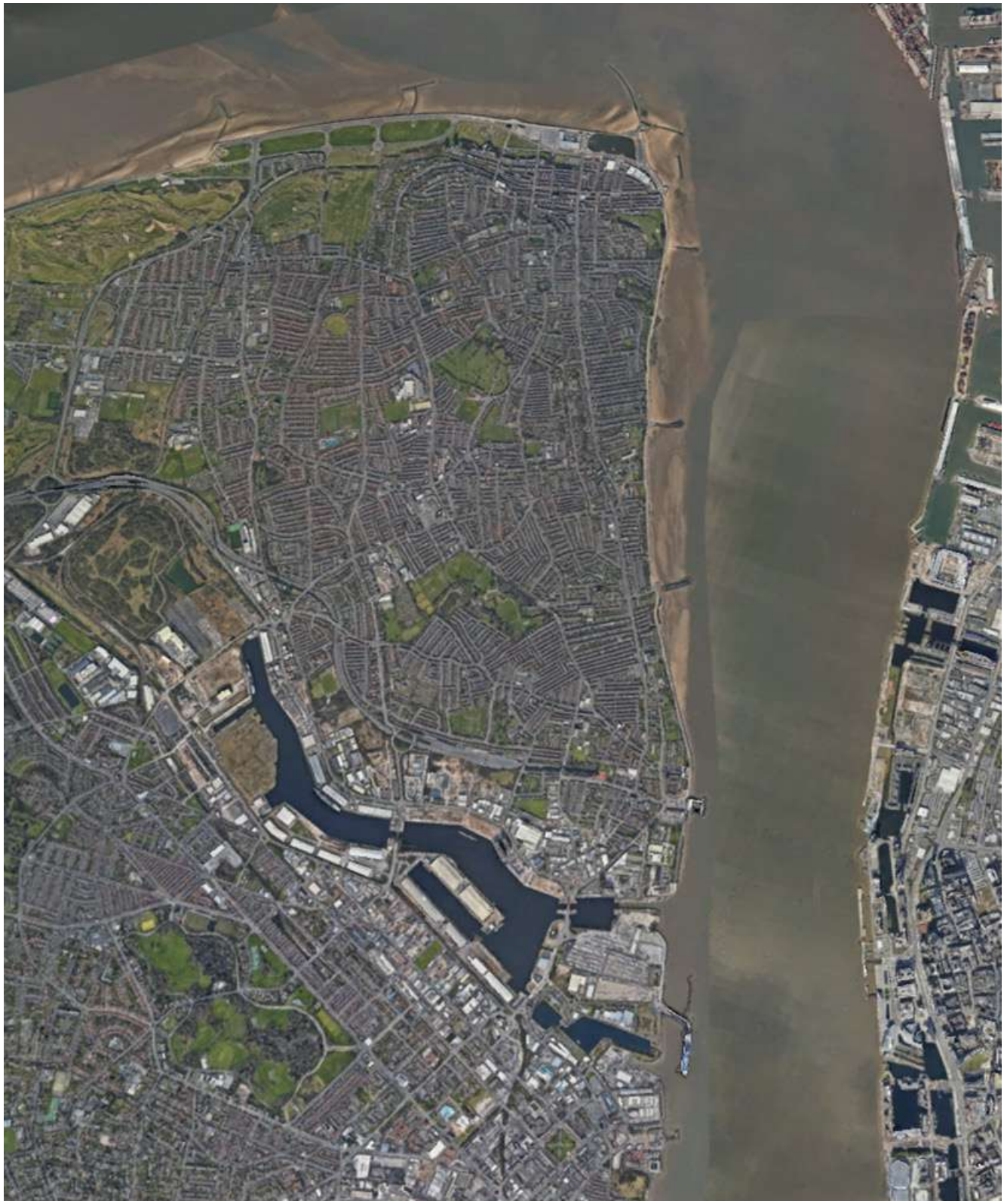
Chemical status of groundwater refers to the assessment or evaluation of the quality and composition of groundwater. It involves analyzing the chemical components, pollutants, or substances present in the groundwater to determine if they meet specific standards or regulations. This assessment helps in understanding the purity, contamination, or presence of any harmful substances in the groundwater resources.


Wallasey
Liscard
Birkenhead
Upton

Habitats – Landscape / Land use inventory

Urban landscapes are city or town areas with dense buildings and high human activity.
Suburban areas are residential zones near cities, with mixed housing and more greenery.
Rough grazing refers to land for livestock with natural vegetation, not intensively farmed.
Water landscapes include lakes, rivers, and wetlands, key for biodiversity and landscape aesthetics.
Grasslands are open areas dominated by grasses, in natural settings or as managed pastures.
Arable landscapes are used for crop cultivation, featuring regularly plowed and planted fields.

- Urban
- Suburban
- Rough grazing
- Water
- Grassland
- Arable



Tidal Flats Along the Wirral Coastline

The River Mersey's tidal flats near Birkenhead are shaped by its large tidal range, exposing rich mudflats at low tide.

These flats are key habitats for migratory birds, offering abundant feeding grounds.

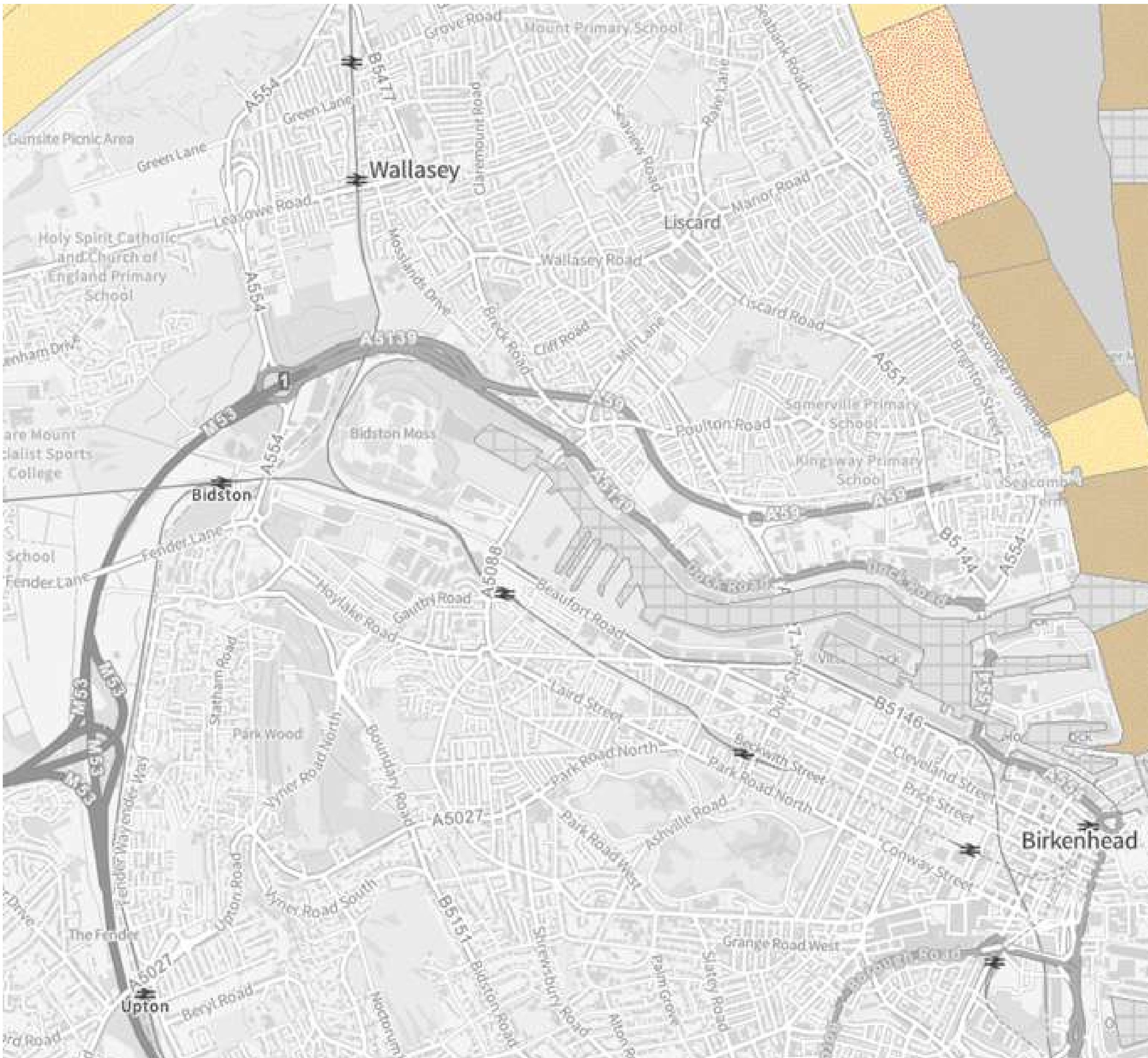
The area's dynamic tides create a unique landscape, alternating between submerged and exposed flats.

They serve as natural coastal defenses, absorbing wave energy and reducing tidal surge impacts.

These flats are also popular for recreational activities like bird watching and walking, showcasing the Mersey's tidal rhythm.

New Brighton beach

New Brighton beach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Green Lane
Gunsite Picnic Area
Leasowe Road
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Claremount Road
Manor Road
Wallasey Road
Liscard Road
Mossland Drive
Breck Road
Cliff Road
Mill Lane
Bidston Moss
Poulton Road
Somerville Primary School
Kingsway Primary School
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Laird Street
Duke Street
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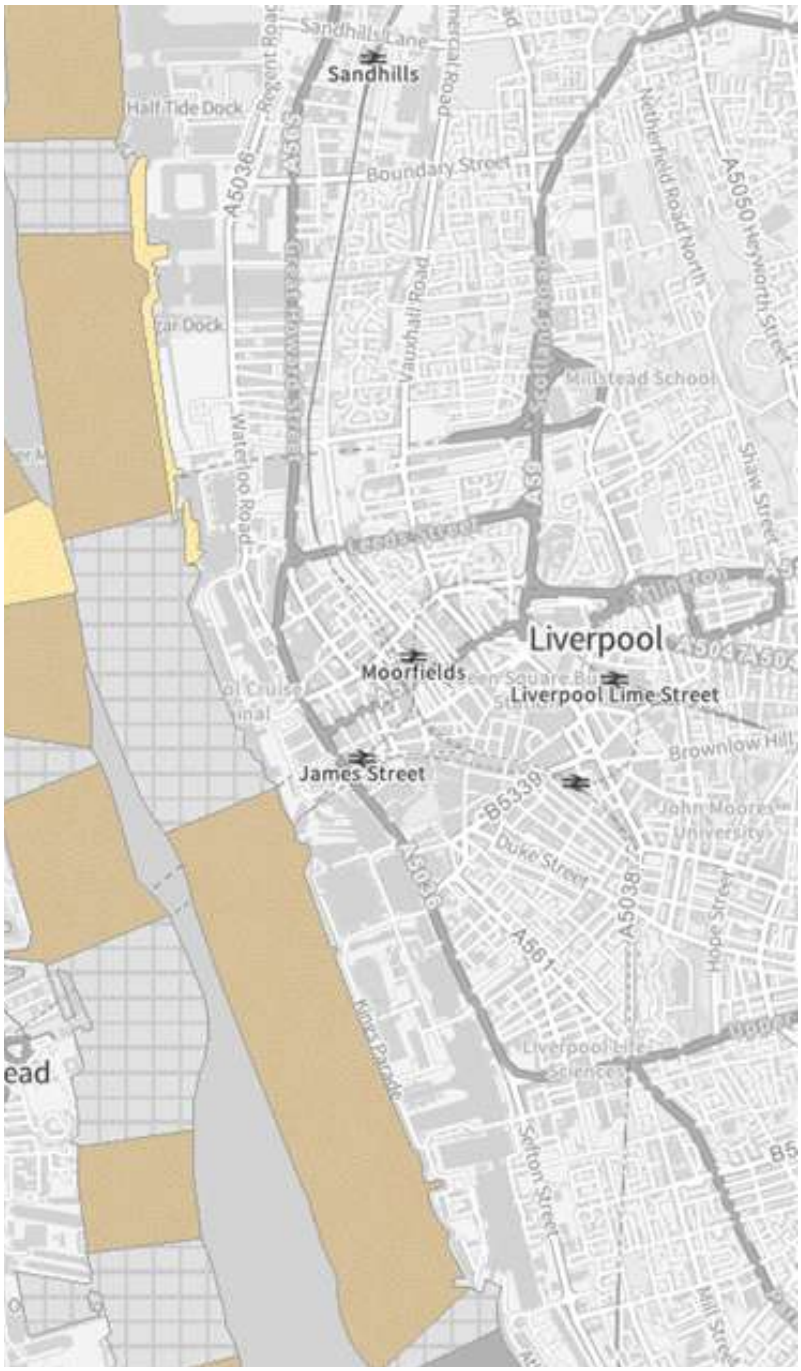
Cleveland Street
Price Street
Conway Street
Ashville Road
Park Road West
Statham Road
Park Wood
Vyner Road North
Vyner Road South
Boundary Road
Upton Road
Fender Way
The Fender
Beryl Road
Bidston Road
Shrewsbury Road
Palm Grove
Slatey Road
Grange Road West
Dock Road
School

Habitats - Marine



Marine mud habitats, often found in deeper waters or estuaries, are characterized by fine sediment that supports a diverse range of marine life, including burrowing creatures and microorganisms.

Man-Made habitats in marine environments are areas altered or created by human activity, often featuring artificial structures that can provide unique ecosystems for marine species.

Marine sand habitats, typically found in shallower waters, consist of coarse sediment and are home to a variety of species, such as crustaceans and fish, adapted to live in or on the sandy seabed.

The Sand and Mud habitat in marine environments is a mix of sandy and muddy areas, offering a diverse substrate that supports a rich array of marine life, including benthic organisms and fish species.

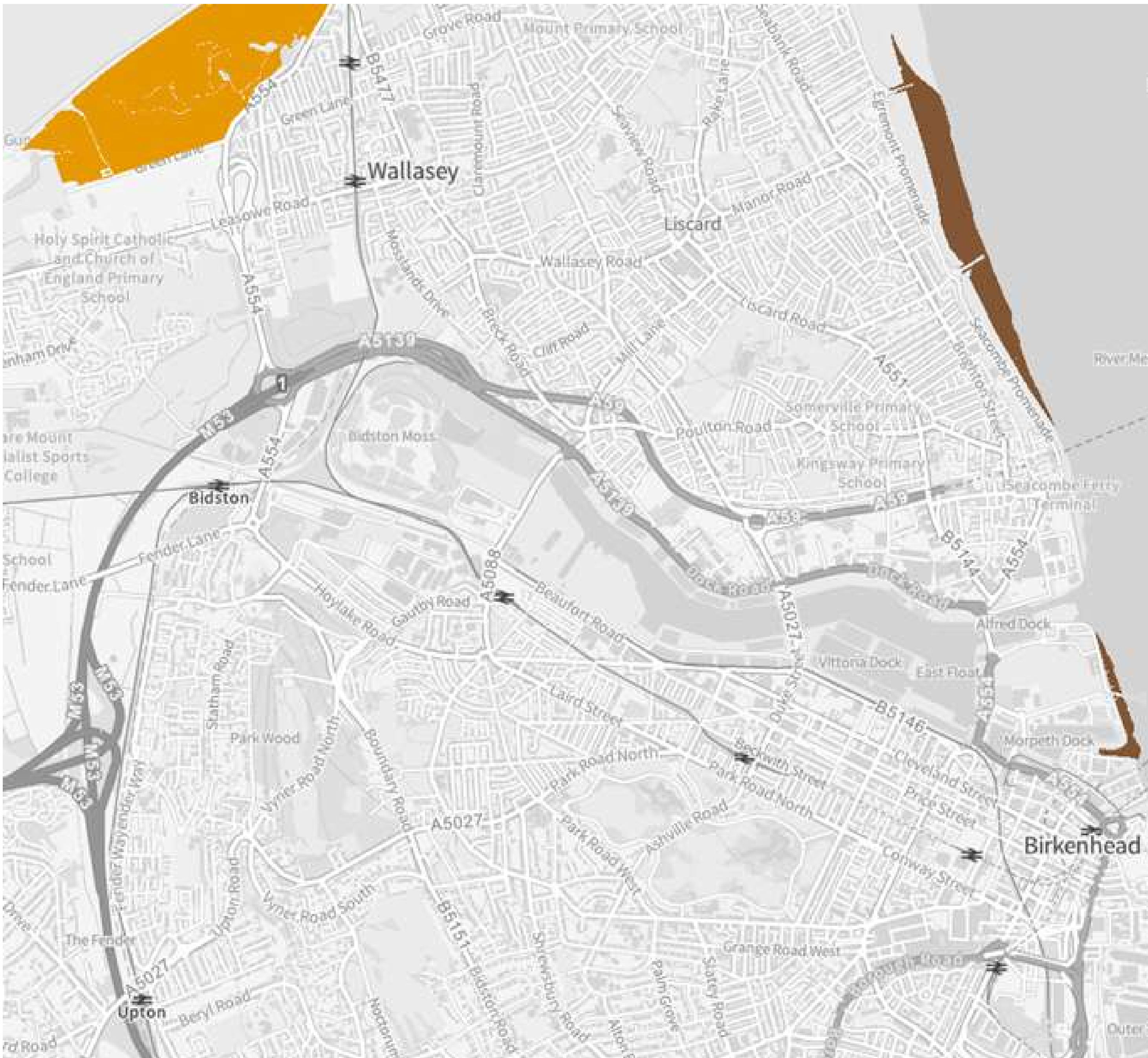
Mud

Made Ground (Man Made)

Sand

Sand and Mud

Image and text source: https://magic.defra.gov.uk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Holy Spirit Catholic and Church of England Primary School
Wallasey Road
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Breck Road
Liscard Road
Cliff Road
Mill Lane
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Seacombe Promenade
Brighton Street
River Mersey
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Somerville Primary School
Poulton Road
Bidston Moss
Kingsway Primary School
Seacombe Ferry Terminal
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Fender Lane
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Hoylake Road
Beaufort Road
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Alfred Dock
Duke Street
Vittoria Dock
East Float
Statham Road
Park Wood
Laird Street
B5146
Morpeth Dock
Vyner Road North
Boundary Road
Park Road North
Beckwith Street
Cleveland Street
Price Street
Ashville Road
Park Road West
Birkenhead
Conway Street
Fender Way
Upton Road
Vyner Road South
B5151
The Fender
Grange Road West
Shrewsbury Road
Palm Grove
Slatey Road
Upton
Beryl Road
Bidston Road
Alton Road
Outer Basin

Habitats - Coastal

Mudflats are coastal wetlands formed by the deposition of mud by tides or rivers, characterized by their flat, muddy surfaces, and are crucial habitats for a variety of wildlife, including migratory birds and marine organisms.

Coastal sand dunes, on the other hand, are dynamic, sandy landscapes formed by wind and wave action along shorelines, providing critical protection against coastal erosion and serving as unique ecosystems for specialized plants and animals adapted to this sandy environment.

Habitat Inventory - Mudflats

Habitat Inventory - Coastal Sand Dunes

Image and text source: https://magic.defra.gov.uk


Grove Road
Mount Primary School
B5477
A554
Green Lane
Gunsite Picnic Area
Green Lane
Wallasey
Claremount Road
Seabank Road
Rake Lane
Egremont Promenade
Manor Road
Liscard
Leasowe Road
Holy Spirit Catholic and Church of England Primary School
Mosslands Drive
Wallasey Road
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Cliff Road
Mill Lane
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Brighton Street
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Somerville Primary School
Poulton Road
Kingsway Primary School
Seacombe Ferry Terminal
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Beaufort Road
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Price Street
Morpeth Dock
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Conway Street
Birkenhead
Road South
B5151
Grange Road West
The Fender
Upton
Beryl Road
Bidston Road
Shrewsbury Road
Palm Grove
Slatey Road

Habitats - Woodland

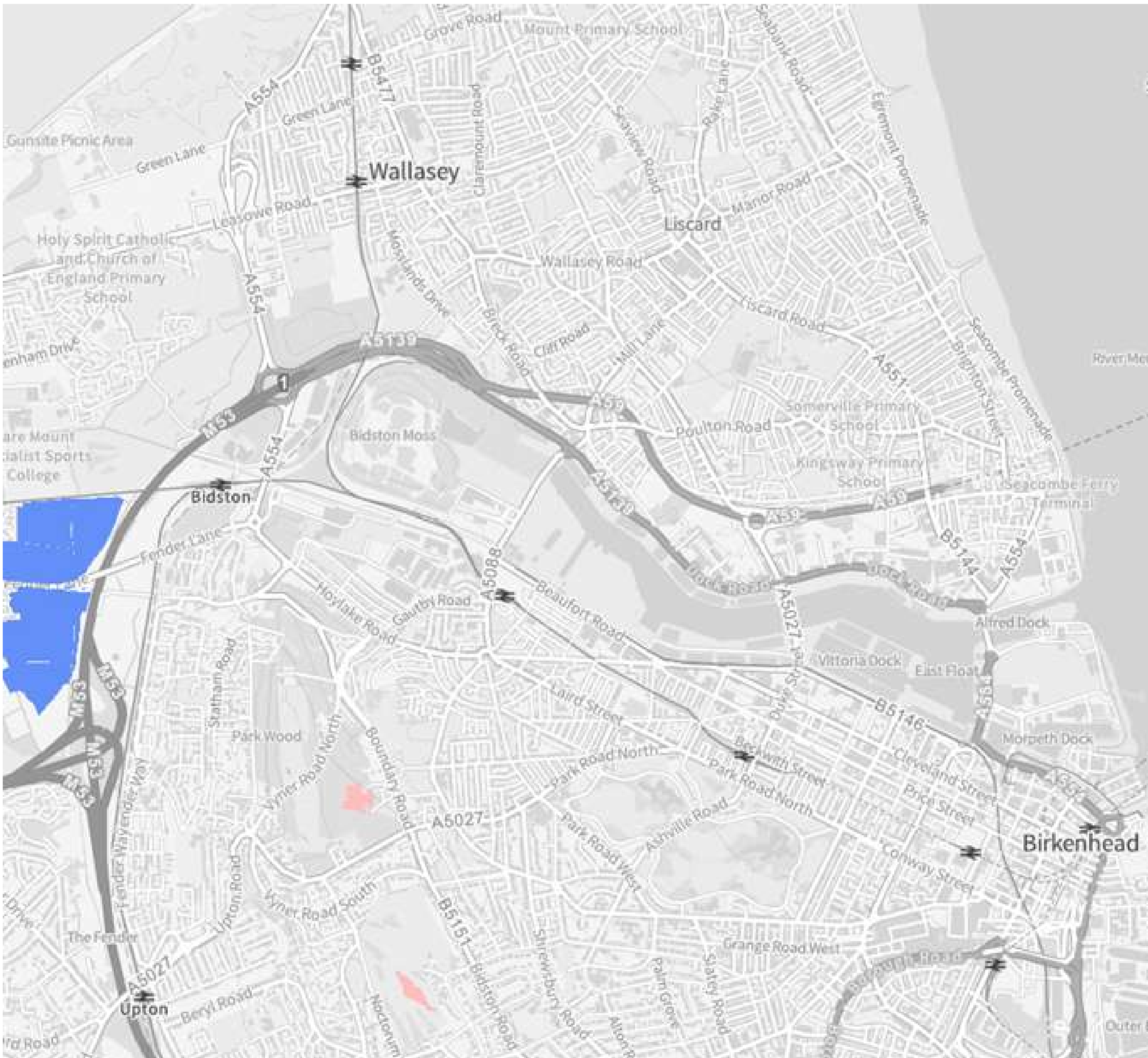
Woodland habitats, consisting of dense trees and underbrush, offer a rich, sheltered environment for a wide variety of wildlife, including birds, mammals, and numerous plant species, contributing significantly to biodiversity.

Parkland habitats, characterized by a mix of open grasslands and scattered trees, provide unique ecosystems that support different wildlife species and recreational spaces for human use, often serving as critical green spaces in urban areas.

Habitat Inventory - Deciduous Woodland

Parkland

Image and text source: https://magic.defra.gov.uk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Gunsite Picnic Area
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Rake Lane
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Egremont Promenade
Manor Road
Liscard
Leasowe Road
Holy Spirit Catholic and Church of England Primary School
Mosslands Drive
Wallasey Road
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Boundary Road
Park Road North
Cleveland Street
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Morpeth Dock
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Park Road West
Ashville Road
Conway Street
Birkenhead
Fender Way
Upton Road
Vyner Road South
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The Fender
Grange Road West
Shrewsbury Road
Palm Grove
Slatey Road
Upton
Beryl Road
Bidston Road
Outer Ba

Habitats - Woodland

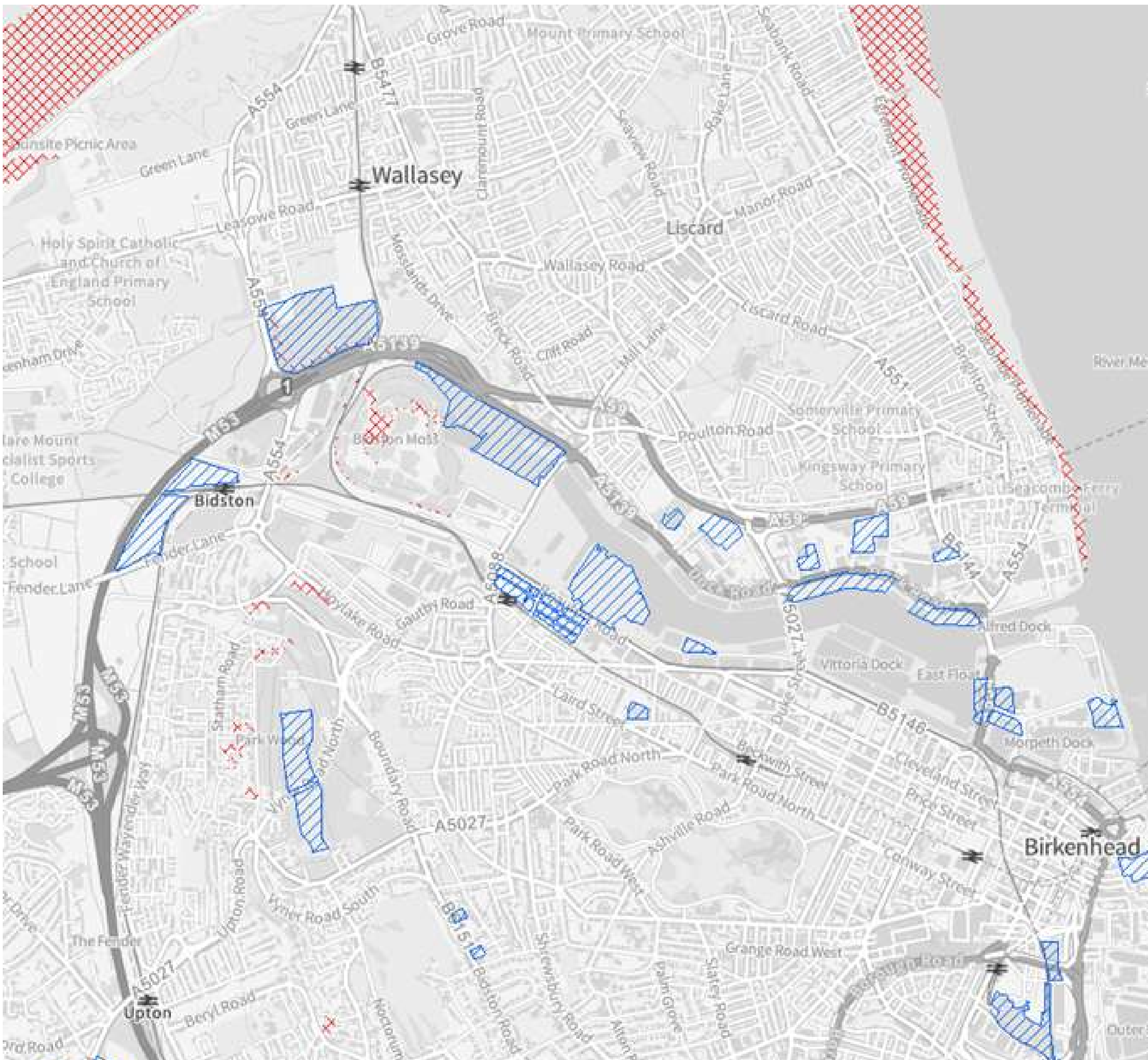
Coastal and Floodplain Grazing Marshes are wetland habitats found along rivers and coastlines, characterized by their grassy vegetation and periodically flooded conditions, supporting a rich biodiversity, including wading birds and aquatic plants.

Lowland Dry Acid Grasslands, in contrast, are found on nutrient-poor, acidic soils, typically in upland areas, and are known for their diverse range of hardy grasses and herbs, providing vital ecosystems for various insects and ground-nesting birds.

Habitat Inventory - Coastal and Floodplain Grazing Marsh

Habitat Inventory - Lowland Dry Acid Grassland

Image and text source: https://magic.defra.gov.uk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Holy Spirit Catholic and Church of England Primary School
Mosslands Drive
Wallasey Road
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Bidston Moss
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Somerville Primary School
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Bidston
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Seacombe Ferry Terminal
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Alfred Dock
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Morpeth Dock
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Cleveland Street
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Ashville Road
Park Road West
Birkenhead
Conway Street
Fender Way
Upton Road
Vyner Road South
The Fender
Grange Road West
Shrewsbury Road
Palm Grove
Slatey Road
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Upton
Beryl Road
Bidston Road
Noctorum
Alton Road
Outer Ba

Habitats - Other

Open mosaic habitats are diverse landscapes typically found on previously developed land, characterized by a patchwork of different microhabitats, such as bare ground, scattered vegetation, and ruderal (weedy) areas. These habitats are particularly valuable for wildlife conservation, as they provide a rich variety of niches supporting a wide range of species, including invertebrates, birds, and rare plants, often in urban or post-industrial settings.

Open Mosaic Habitat

No main habitat but additional habitat exists

Image and text source: https://magic.defra.gov.uk


Wallasey
Liscard
Bidston
Birkenhead
Upton
Grove Road
Mount Primary School
Green Lane
Gunsite Picnic Area
Leasowe Road
Holy Spirit Catholic and Church of England Primary School
Claremount Road
Seaview Road
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Manor Road
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The Fender
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Bidston Road
Shrewsbury Road
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Slatey Road
Grange Road West
Duke Street
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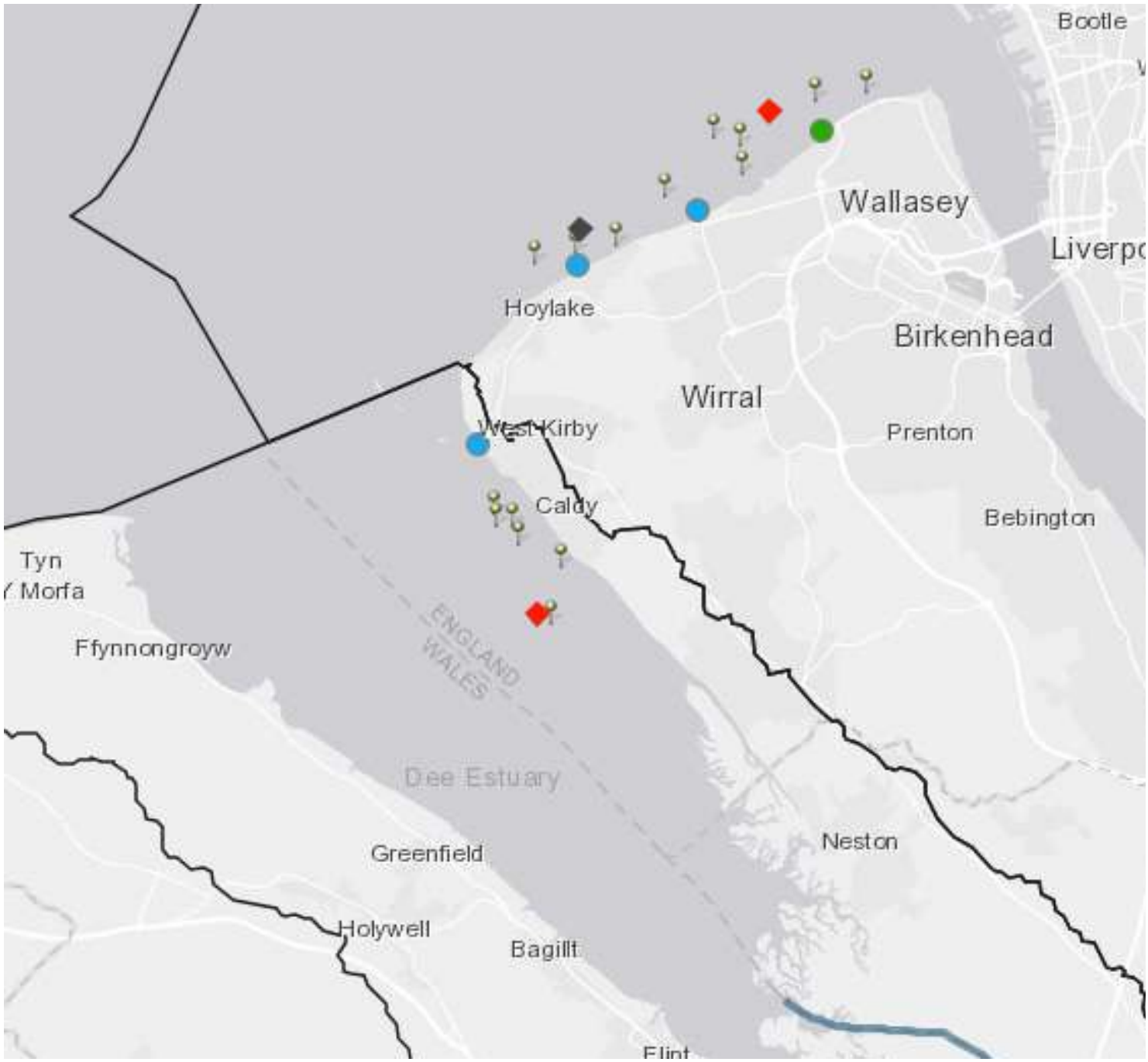
B5144
B5151

Habitats – Important bird areas

Important Bird Areas in UK are key sites designated for the conservation of bird populations, identified based on internationally agreed criteria, primarily focusing on threatened species and significant bird congregations. These areas, which encompass a variety of habitats like wetlands, coastlines, and forests, play a crucial role in protecting avian biodiversity and supporting the survival of both resident and migratory bird species. IBAs in Great Britain are integral to national and international conservation efforts, contributing to the broader objectives of the BirdLife International partnership and aiding in the monitoring and protection of important bird species and their habitats.

Important bird areas

Image and text source: https://magic.defra.gov.uk


Bootle
Wallasey
Liverpo
Hoylake
Birkenhead
Wirral
West Kirby
Prenton
Caldy
Bebington
Tyn
Morfa
Ffynnongroyw
ENGLAND
WALES
Dee Estuary
Neston
Greenfield
Holywell
Bagillt
Flint

Water Usage Along the Outer Coastline

Shellfish waters refer to areas in bodies of water, like rivers, estuaries, or coastal zones, where shellfish like mussels, oysters, clams, and scallops are harvested for consumption. These areas need to meet specific quality standards to ensure that the shellfish harvested from them are safe for human consumption.

Bathing waters refer to designated coastal areas or beaches where people swim or bathe in the sea. These areas are monitored for water quality to ensure they meet specific cleanliness and safety standards for public health.

Country border

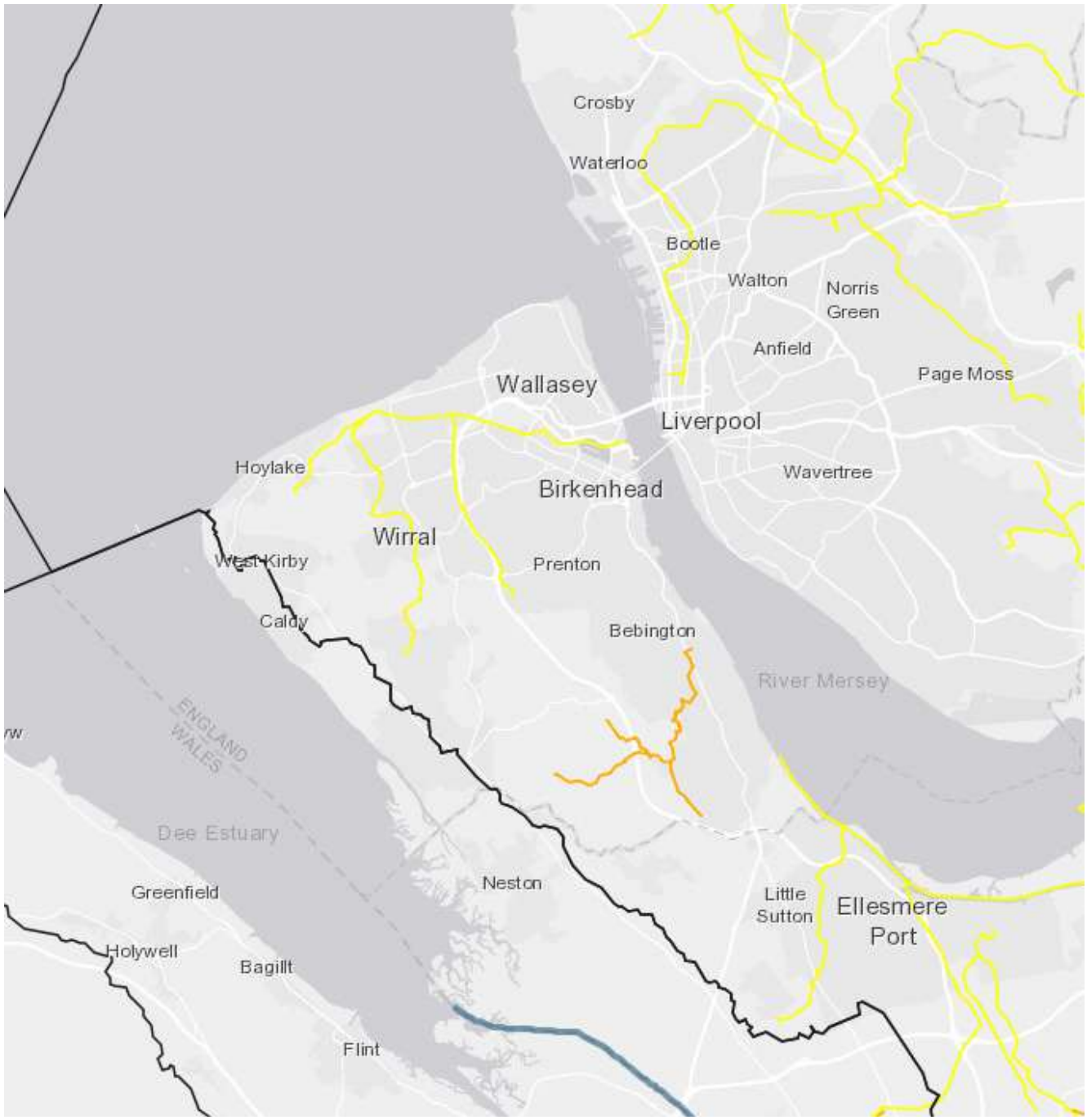
bathing waters

- Excellent
- Good
- Sufficient
- Poor
- un-assessed

shellfish waters

- Pass
- Fail
- Not assessed/monitored

shellfish monitoring points


Crosby
Waterloo
Bootle
Walton
Norris Green
Anfield
Page Moss
Wallasey
Liverpool
Hoylake
Birkenhead
Wavertree
Wirral
West Kirby
Prenton
Caldy
Bebington
River Mersey
ENGLAND
WALES
Dee Estuary
Greenfield
Neston
Little Sutton
Ellesmere Port
Holywell
Bagillt
Flint

The Birket including Arrowe Brook and Fender Water Bodies

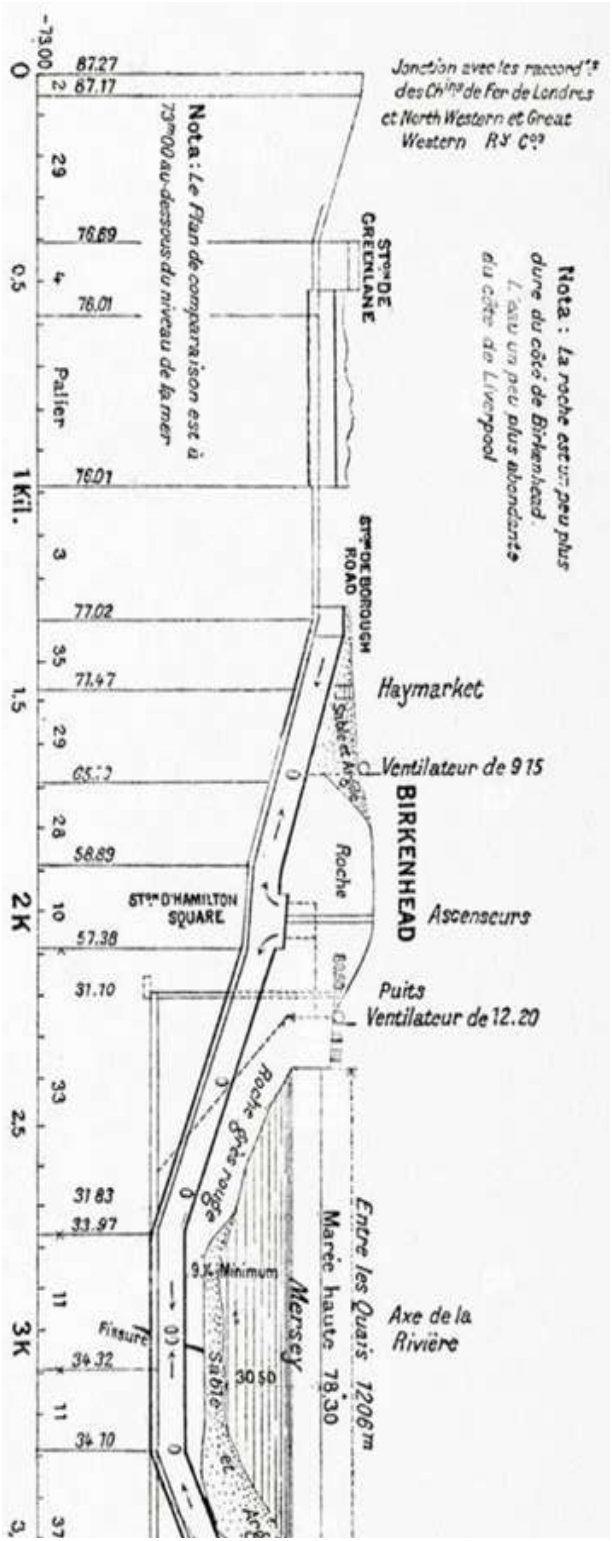
Attributes

Water Body ID GB112068060530	**Water Body Type** River	**Hydromorphological designation** heavily modified	**NGR** SJ2638687986
Surveillance Water Body No	**Length** 26.134 km	**Catchment area** 78.264 km2	**Catchment area** 7826.434 ha

Classifications

Time period: Cycle 3

Classification Item	2019	2022
Ecological	Moderate	Moderate
Biological quality elements	Poor	Poor
Fish	Poor	Poor
Invertebrates	Poor	Poor
Macrophytes and Phytobenthos Combined		
Macrophytes Sub Element	Good	Good
Physico-chemical quality elements	Moderate	Moderate
Ammonia (Phys-Chem)	Moderate	Poor
Biochemical Oxygen Demand (BOD)		Moderate
Dissolved oxygen	Bad	Bad
Phosphate	Poor	Poor
Temperature	High	High
pH	High	High
Hydromorphological Supporting Elements	Supports good	Supports good
Hydrological Regime	Supports good	Supports good
Supporting elements (Surface Water)	Moderate	Moderate
Mitigation Measures Assessment	Moderate or less	Moderate or less
Specific pollutants	High	High
Triclosan	High	High
Chemical	Fail	Does not require assessment
Priority hazardous substances	Fail	Does not require assessment
Benzo(a)pyrene	Good	
Dioxins and dioxin-like compounds	Good	
Heptachlor and cis-Heptachlor epoxide	Good	
Hexabromocyclododecane (HBCDD)	Good	
Hexachlorobenzene	Good	
Hexachlorobutadiene	Good	
Mercury and Its Compounds	Fail	
Nonylphenol	Good	
Perfluorooctane sulphonate (PFOS)	Fail	
Polybrominated diphenyl ethers (PBDE)	Fail	
Priority substances	Good	Does not require assessment
Fluoranthene	Good	
Other Pollutants	Does not require assessment	Does not require assessment



Mersey Ferry (19th) steam operated ferries

The Runcorn railway bridge (1868)

A railway tunnel between Birkenhead and Liverpool (1886)

The Qweensway road tunnel (1934)

The Silver Jubilee bridge (1961)

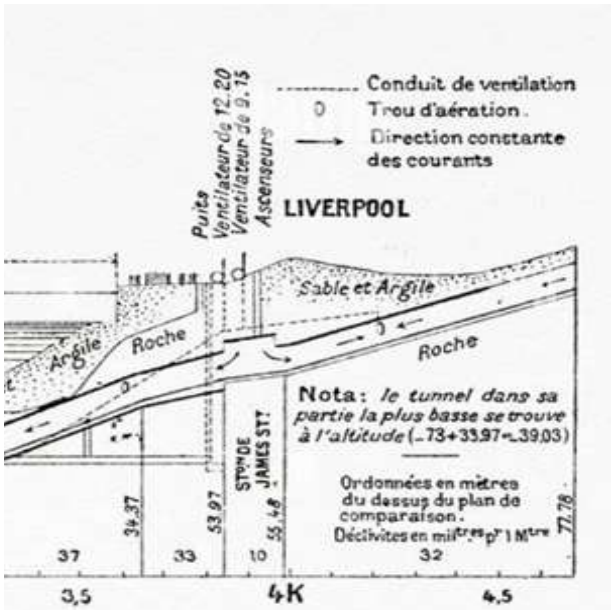
The Kingsway road tunnel (1971)

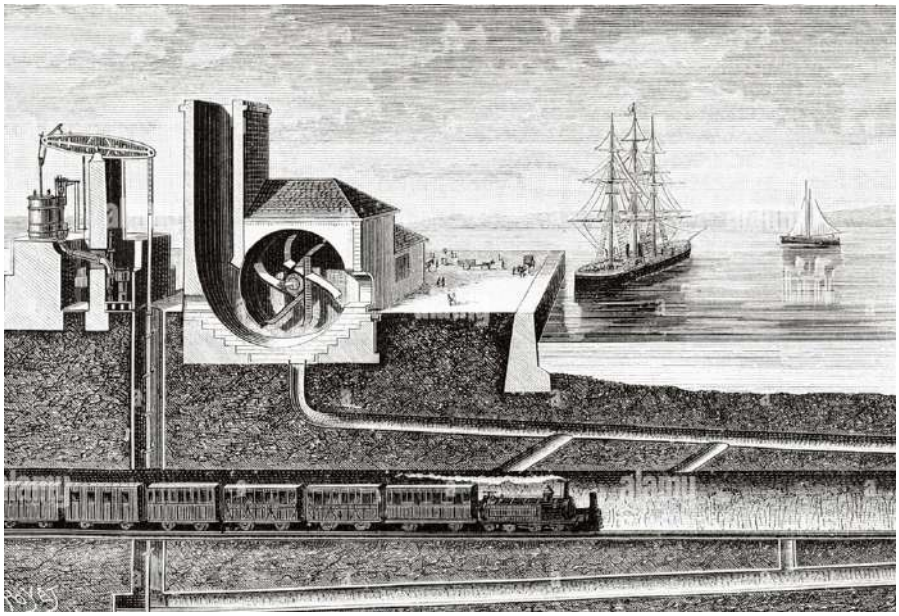
Development of connections between both costs of river Mersey

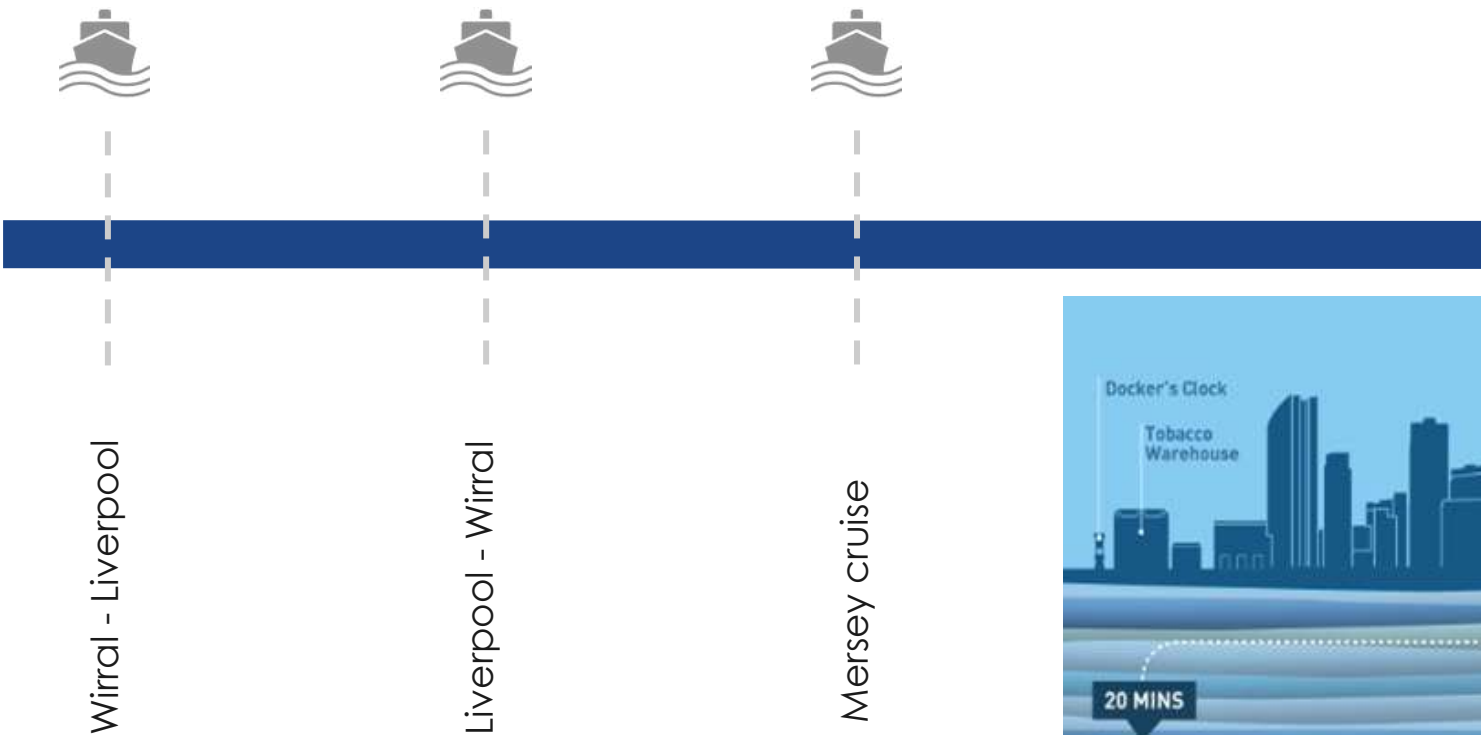
The Kingsway road tunnel (1971)

Mersey Getway bridge (2017)

River Mersey






Wirral - Liverpool
Liverpool - Wirral
Mersey cruise

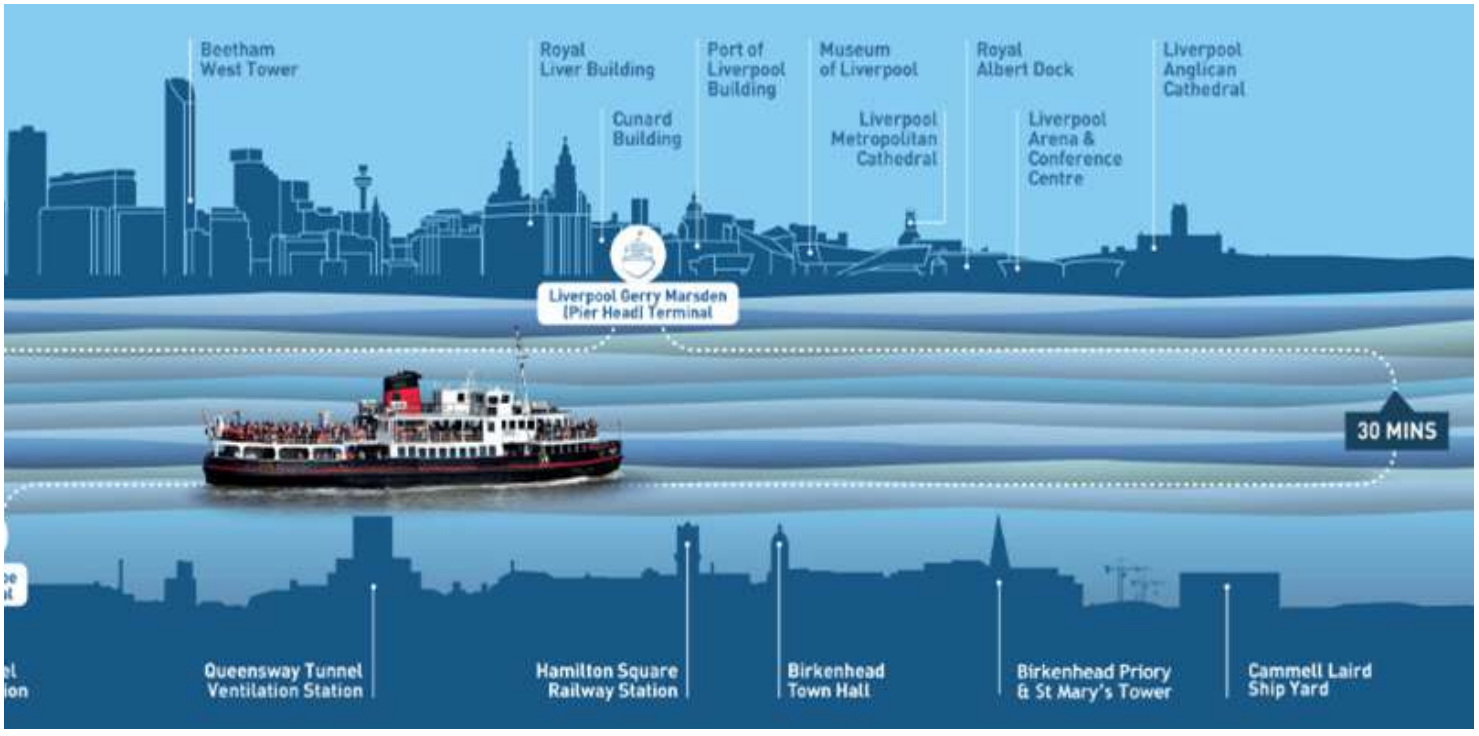

Docker's Clock
Tobacco Warehouse
20 MINS
Seacombe Terminal
Wallasey Town Hall
Kingsway Tunnel Ventilation Station

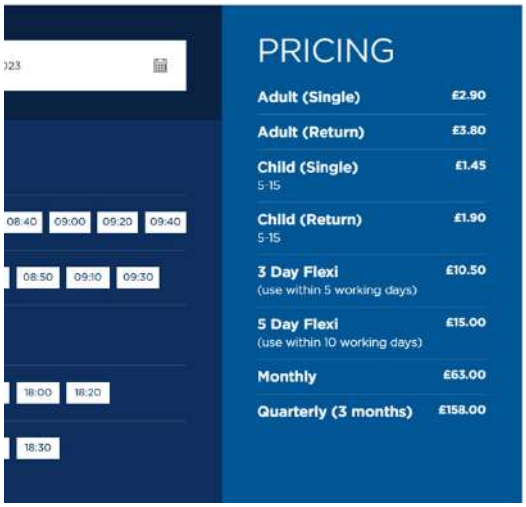

Isle of Man
Belfast - Birkenhead
Seacombe Ferry
Birkenhead
Anlegestelle Pier
Liverpool
Belfast - Birkenhead
Mersija
Woodside Ferry Terminal
Birkenhead

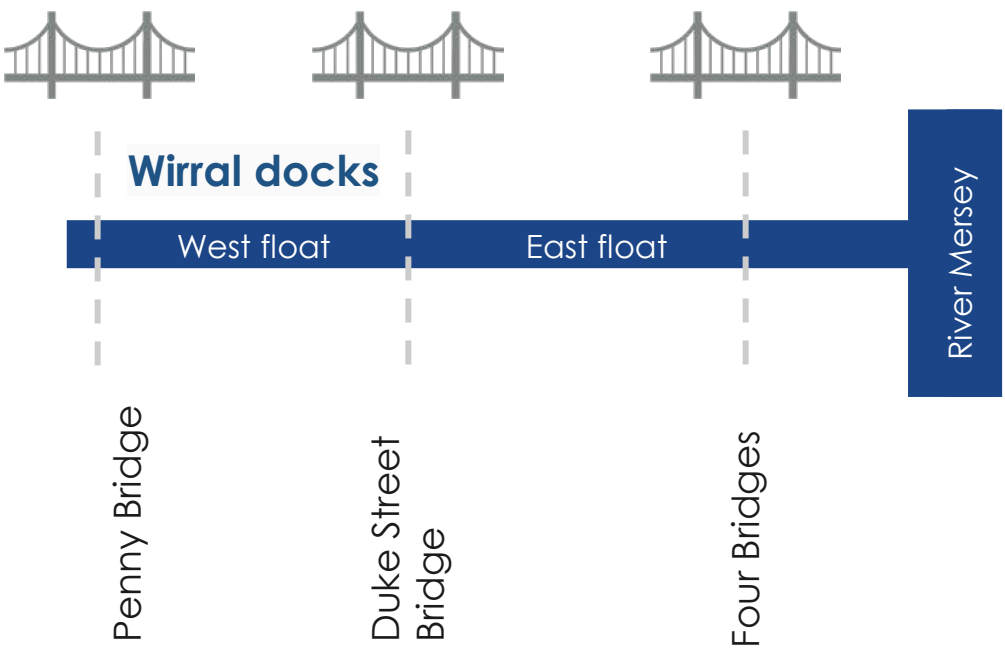

TIMETABLES
Check the departure times for ...
10/11/2023
Morning
Seacombe
Wirral
07:20
07:40
08:00
08:20
08:40
Gerry Marsden
Liverpool
07:30
07:50
08:10
08:30
08:50
Afternoon
Gerry Marsden
Liverpool
16:40
17:00
17:20
17:40
18:00
Seacombe
Wirral
17:10
17:30
17:50
18:10
18:30

Ferry Transit and Mersey Cruise

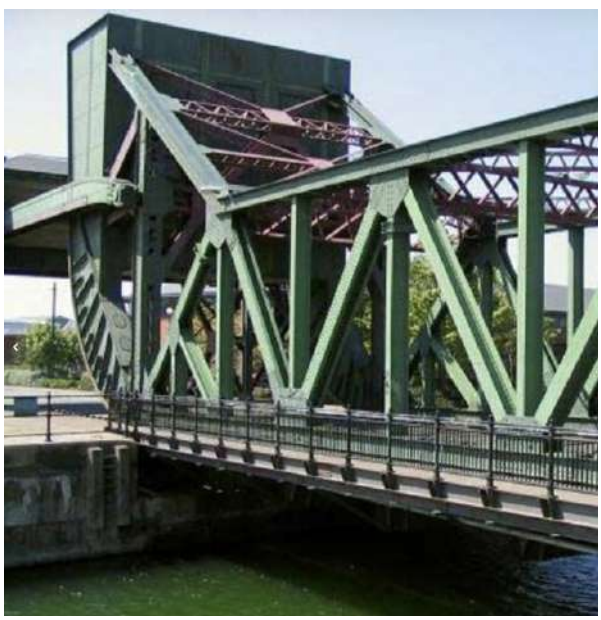
River Mersey





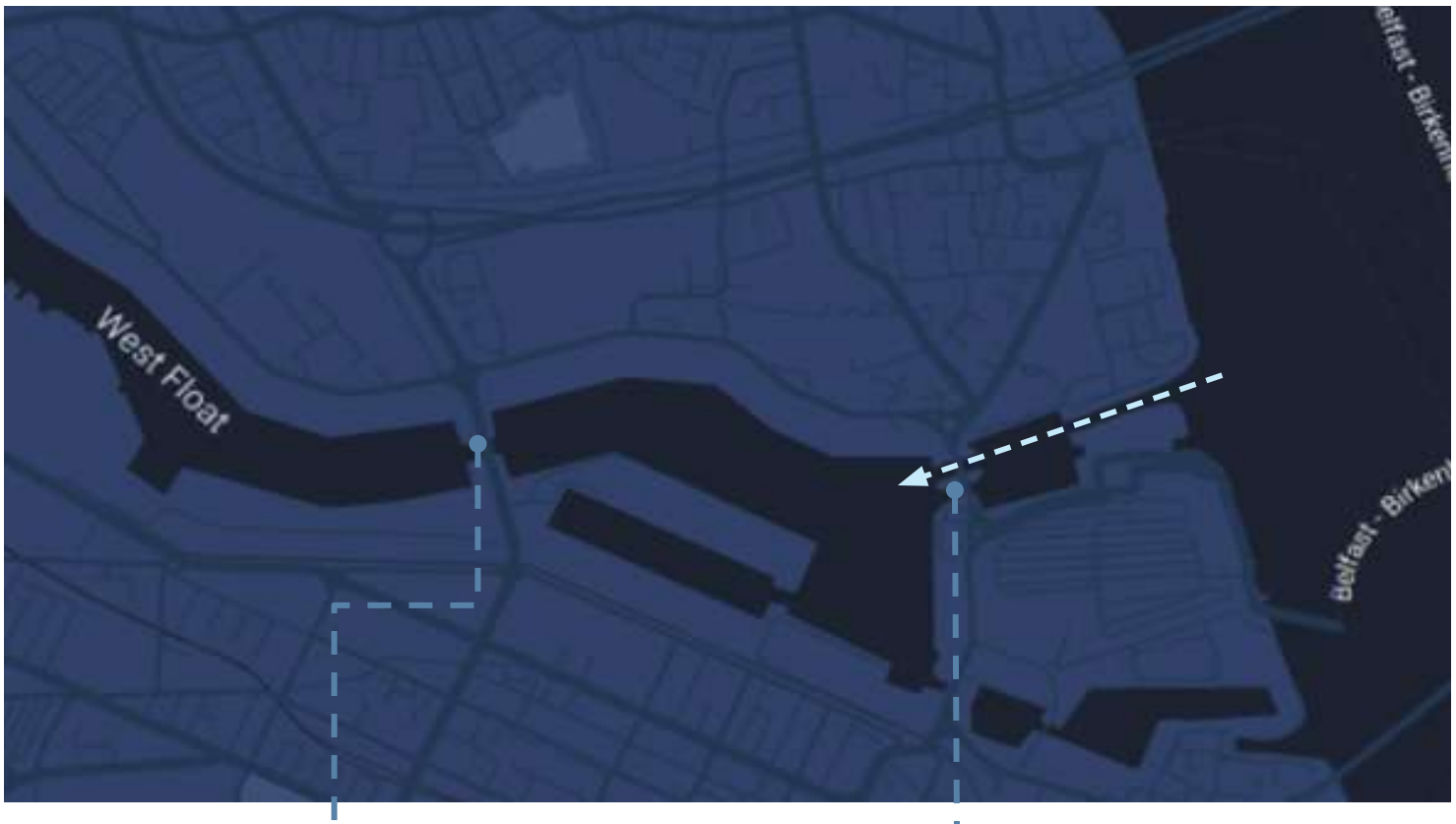


Penny Bridge



Duke Street Bridge

Wirral Dock Bridges

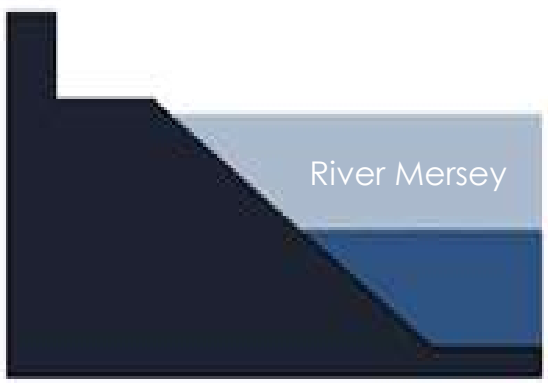


Four Bridges - bridge A

Docks

River Mersey

Water Edge Types

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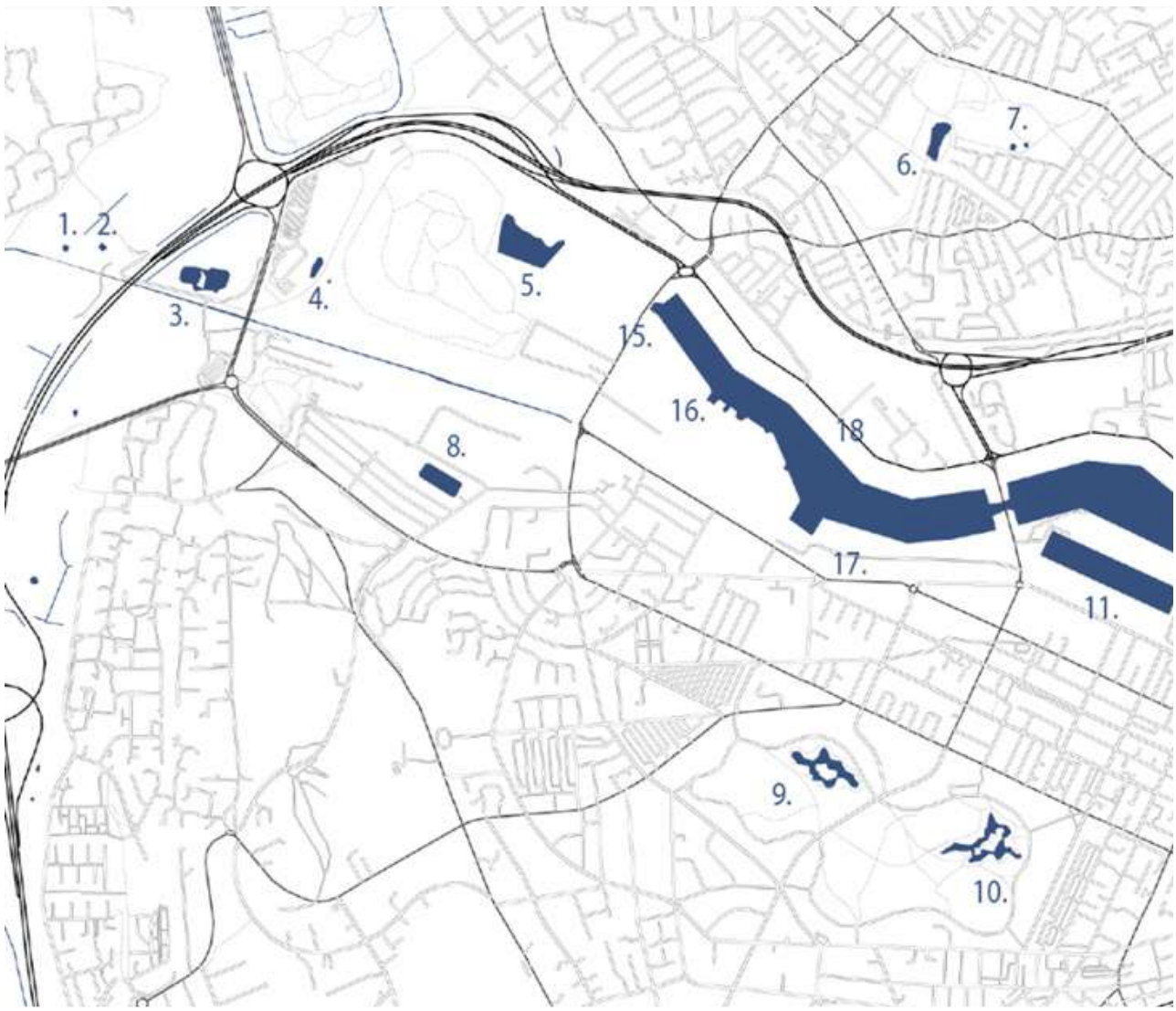
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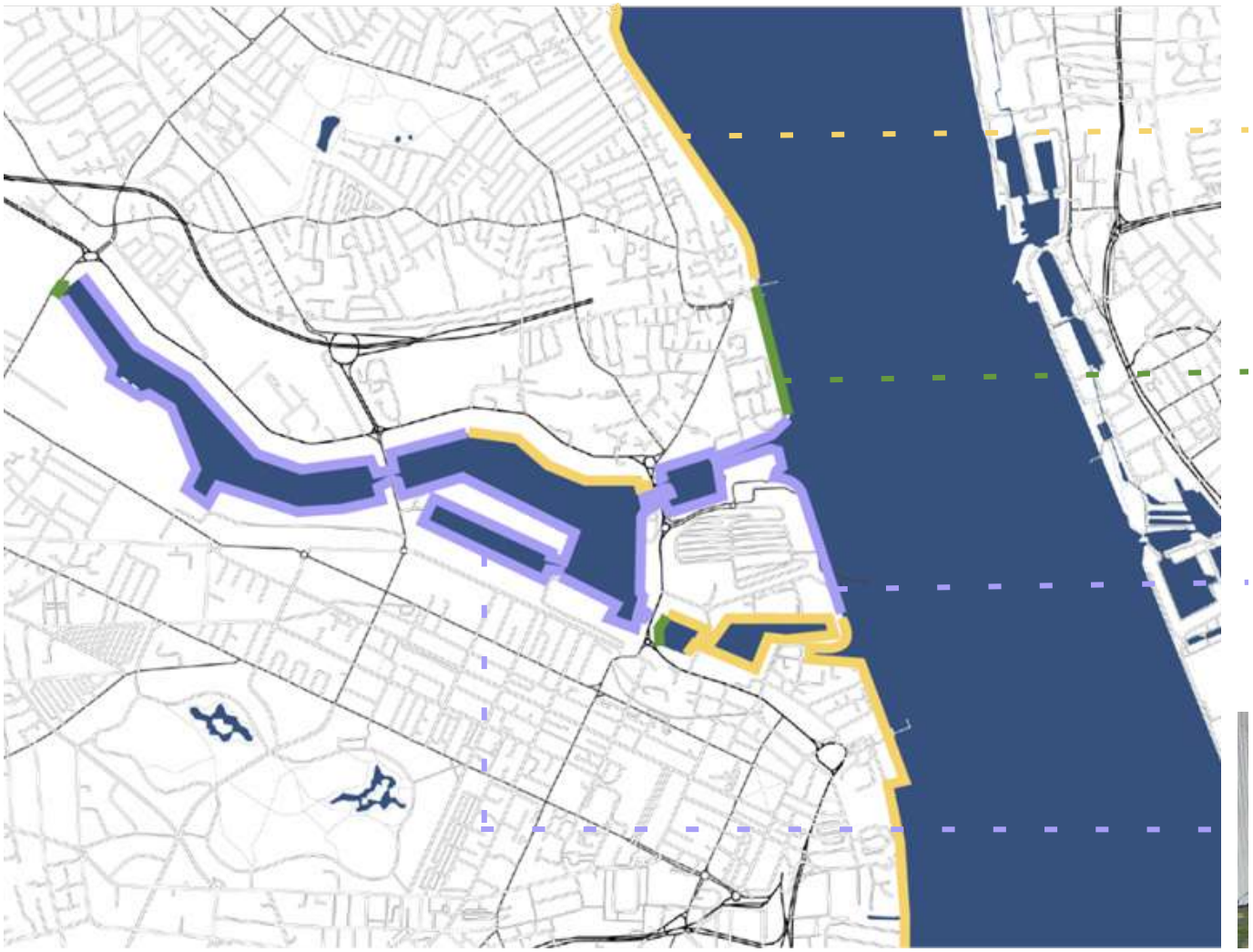
18

Wirral waters water bodies
Ponds, docks, waterfronts



Waterfronts
Accessibility

Walking path
Bike lane
View to Liverpool

Walking path
Bike lane

Walking path
Bike lane

Closed territory
Industrial area

RS&PC - radio sc

Central Park

Pride Park

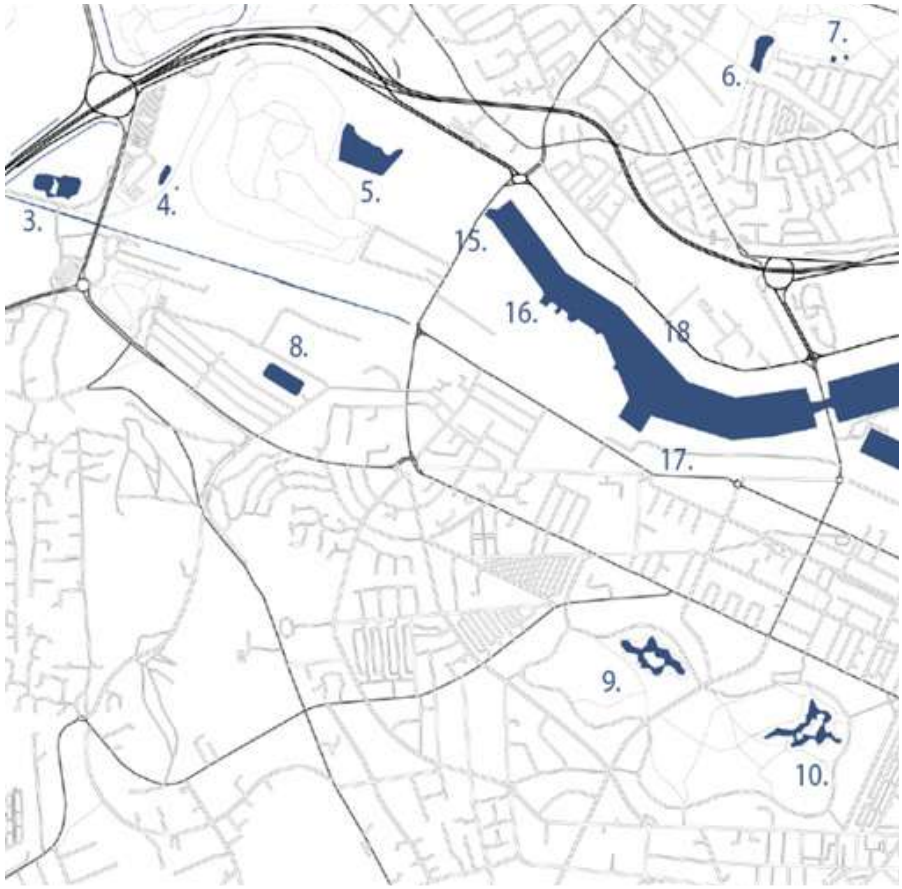
Lower Park Fishin

Waterfronts
Accessibility

dio sailing & power club

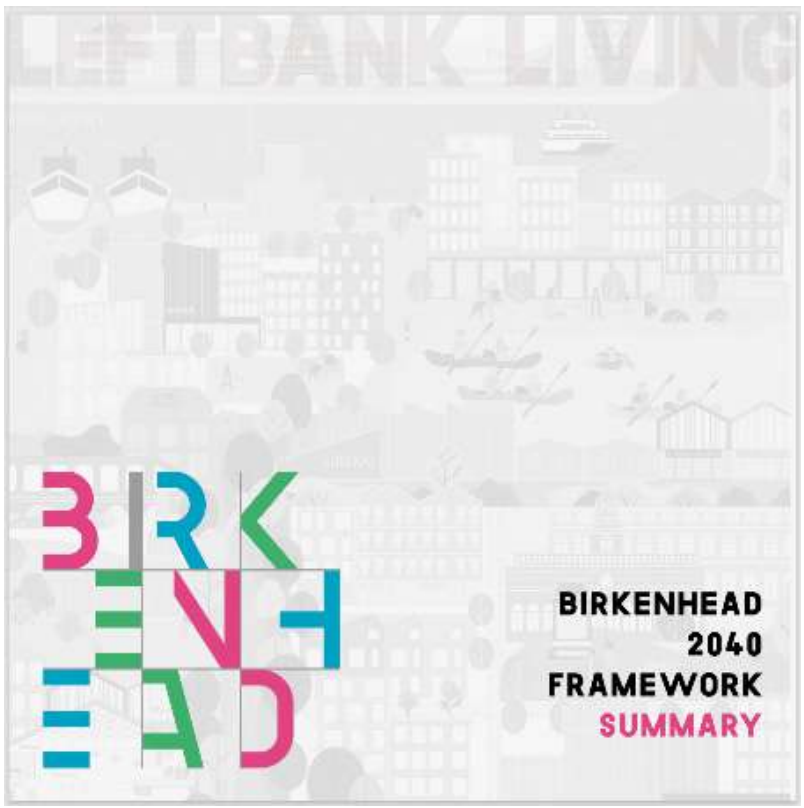
k

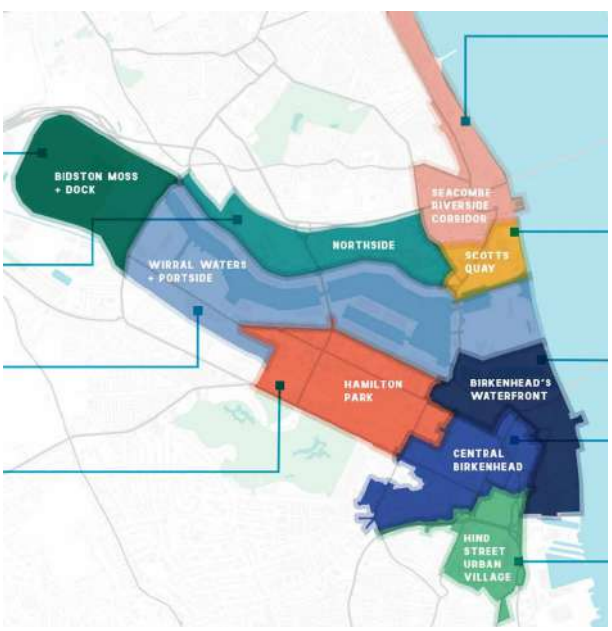
Fishing Lake



Developed Spatial Planning Documents

Strategic Goal:
Achieving an Internationally Recognizable City Waterfront


LEFTBANK LIVING
BIRKENHEAD
2040
FRAMEWORK
SUMMARY


BIDSTON MOSS
+ DOCK
WIRRAL WATERS
+ PORTSIDE
NORTHSIDE
SEACOMBE
RIVERSIDE
CORRIDOR
SCOTTS
QUAY
HAMILTON
PARK
BIRKENHEAD'S
WATERFRONT
CENTRAL
BIRKENHEAD
HIND
STREET
URBAN
VILLAGE

The Birkenhead 2040 Framework

The goals:
To make Birkenhead into a waterfront garden city (homes and green spaces which are attractive and good for the environment)
Create more spaces for walking and cycling
Make Birkenhead a leader in tackling climate change. Make sure nature and wildlife are looked after.
Help people in Birkenhead to live healthy lives. Help people to be more active.

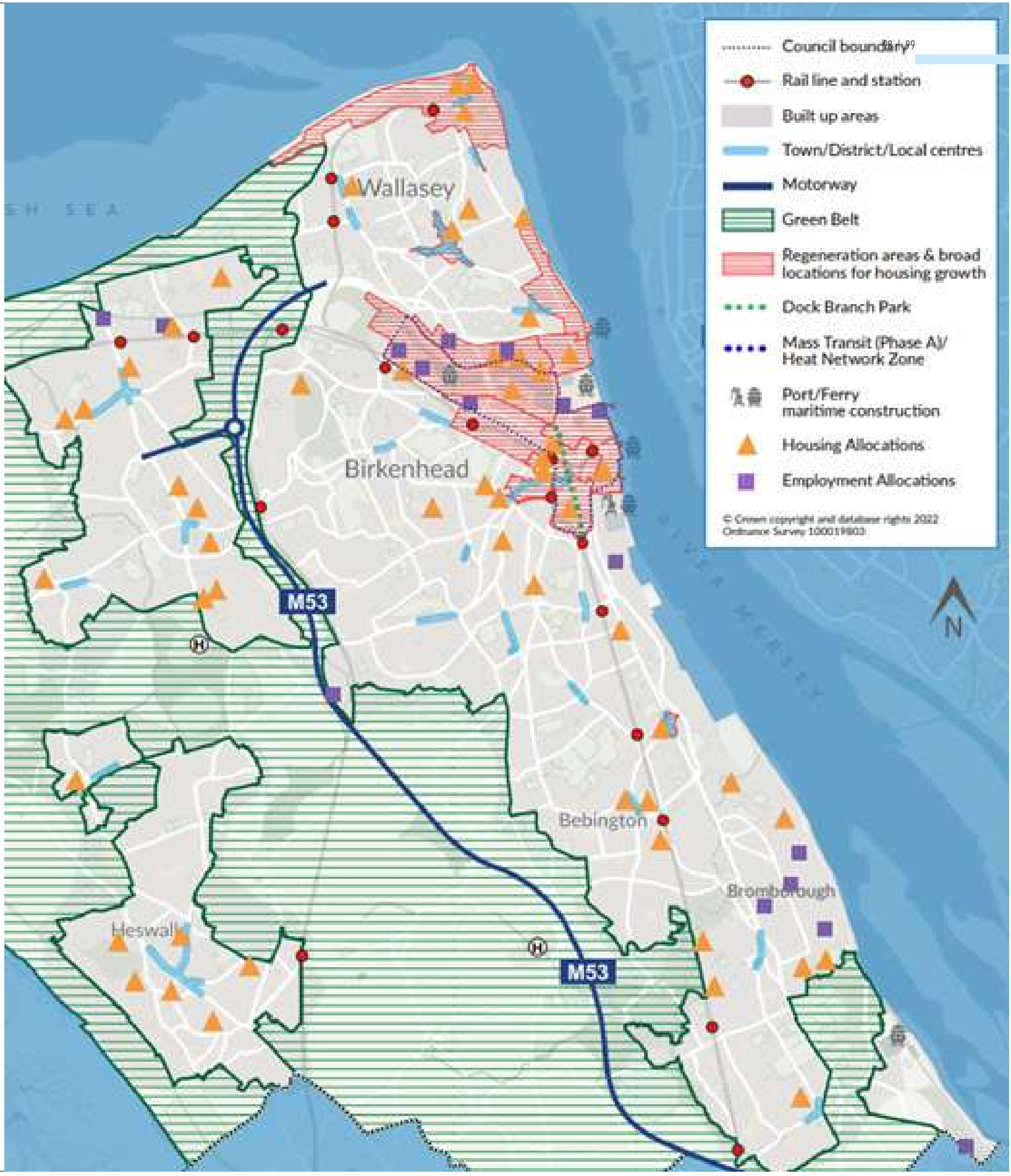
The ideas for neighbourhoods:

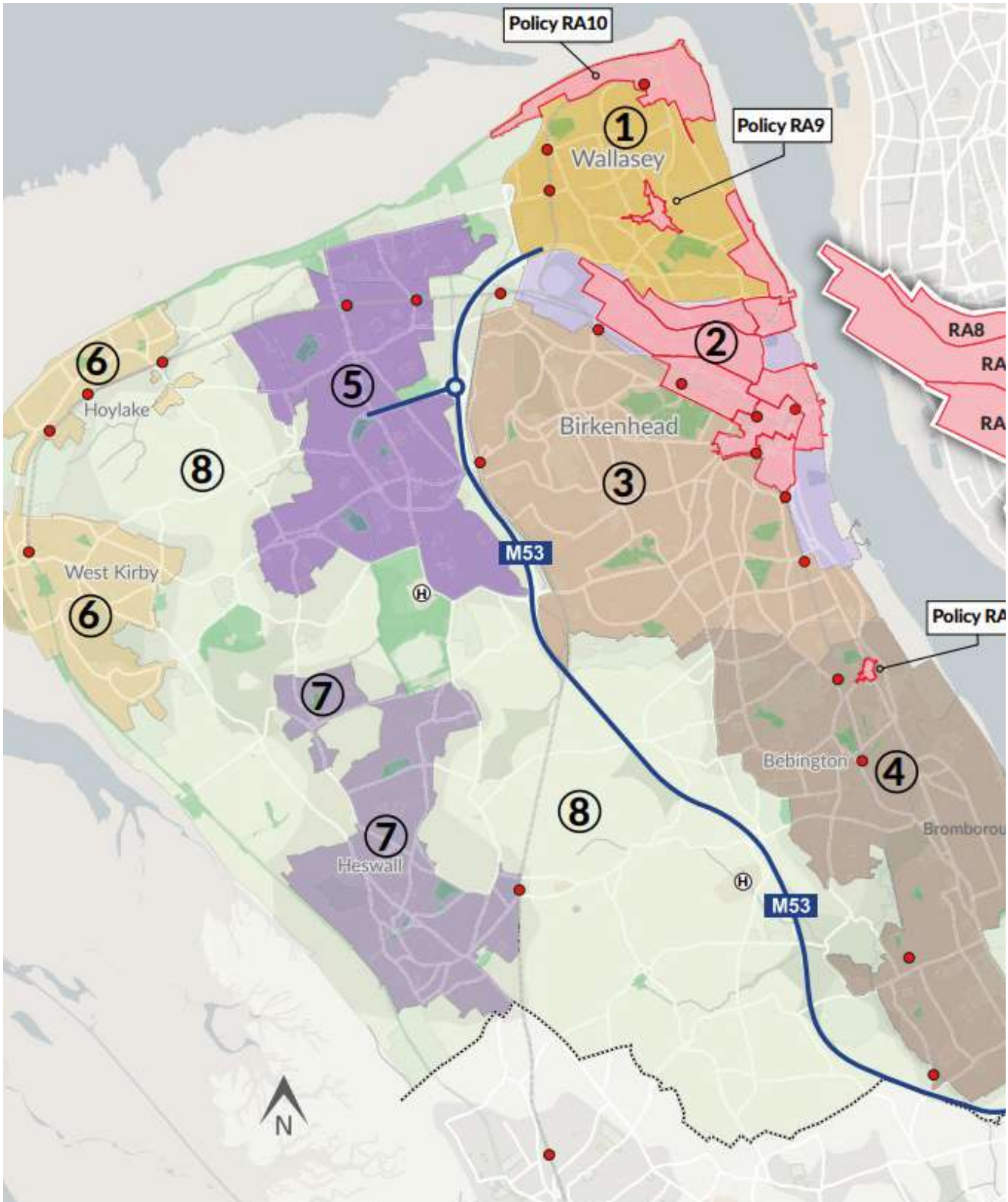
- for Birkenhead Waterfront : Birkenhead has a great location on the River Mersey. There are excellent views across to the famous buildings in Liverpool. The 2040 Plan will create a more attractive waterfront. There will be new houses and more places to eat and drink. More people will visit the waterfront
- For Wirral Waters and Portside : Wirral Waters is one of the biggest regeneration projects in the country. Building has already started and will continue for at least another 15 years. This project belongs to a developer called Peel Land and Property. They are building many new homes, new offices and new leisure attractions around Birkenhead Docks. The 2040 Plan will support the growth of the Port. The Port is important for local industry and jobs. The port provides ferry journeys to Belfast.
- For Seacombe Riverside Corridor : This neighbourhood is next to the River Mersey waterfront. The 2040 Plan will build more houses on empty land. A big new visitor attraction will open in 2022 called Eureka! Mersey. This will be a science and discovery centre for children and young people. There will be improvements to the Promenade to New Brighton. This is an enjoyable space for walking and cycling. We would like more people to use it
- For Bidston Moss : This is an important outdoor space for people to enjoy. It will be protected. There is empty land which used to be part of the dock. This land can be used for more leisure attractions.

Birkenhead 2040 has priority projects

- Wirral Waters (This project belongs to a developer called Peel Land and Property. They are building many new homes, new offices and new leisure attractions around Birkenhead Docks.)
- East West cultural links (Birkenhead has beautiful spaces including Birkenhead Park and Hamilton Square. Improvements will be made to the town centre and the River Mersey waterfront. This “East West” project will make sure these beautiful spaces are joined together for walking and cycling.
- Woodside Gyratory (This is a large area of road and near Hamilton Square Station. It will be improved to make it better for walking and cycling. It

THE KEY DIAGRAM INDICATES BROAD LOCATIONS FOR STRATEGIC DEVELOPMENT TO DELIVER THE LOCAL PLAN VISION


Council boundary
Rail line and station
Built up areas
Town/District/Local centres
Motorway
Green Belt
Regeneration areas & broad locations for housing growth
Dock Branch Park
Mass Transit (Phase A)/ Heat Network Zone
Port/Ferry maritime construction
Housing Allocations
Employment Allocations
© Crown copyright and database rights 2022 Ordnance Survey 100019803
Wallasey
Birkenhead
Bebington
Bromborough
Heswall
M53
M53
N


Policy RA10
Policy RA9
1
Wallasey
2
RA8
RA
RA
6
Hoylake
5
Birkenhead
8
3
M53
West Kirby
6
Policy RA
7
Bebington
4
8
Bromborou
7
Heswall
M53
N

WIRRAL LOCAL PLAN 2021 - 2037

2. REGENERATION AREA POLICIES

Policy RA2: Scotts Quay
This area will be a natural extension to the Wirral Waters Regeneration Area East Float Residential Area (see RA6).
The policy requires that the area will provide for approximately 700 dwellings along with mixed-use employment development. As with each RA policy, RA2 includes a number of development criteria covering planning matters such as density, design, active travel and transport.
The policy also identifies and sets development crieria for Birkenhead Road Masterplan Area and East Street Masterplan Area, and Kelvin Road Mixed Use Neighbourhood.

Policy RA3: Birkenhead Waterfront
Birkenhead's waterfront covers a significant and underutilised area within the wider Birkenhead urban area. Maximising its waterside location and the value of its view of Liverpool's impressive waterfront and skyline, there is potential to create a unique and iconic location for waterside living, culture, visitor attractions, leisure and commercial uses.
Policy RA3 explains that the Waterfront will provide for approximately 630 dwellings including mixed-use residential employment development and supporting community facilities.
Development will be focused on the following masterplan areas: - Woodside, Rose Brae and Dock Branch - Woodside and Gyratory - Rose Brae Village - Land between Rose Brae Village and Woodside - Dock Branch Park - Morpeth Dock and Priory Village Mixed Use Neighbourhoods.

Policy RA6: Wirral Waters Regeneration Area
• The Wirral Waters Regeneration Area comprises three catalyst areas: - East Float - West Float - Bidston Dock
• Within these areas a number of developments are already progressing through the planning process with outline planning permissions for both East Float and West Float. Construction has started on the 1st phase of the Urban Splash and Peel L&P joint venture development on Northbank In addition, works on the 500 apartment 'Legacy' project commenced in early 2022.
• The regeneration area will provide for approximately 3,230 dwellings and a series of mixed-use urban neighbourhoods, along with significant employment development and port related activities.
• The policy includes key principles to be taken forward into the following masterplan areas: - East Float - MEA Park - Bidston Dock Policy RA7: Hamilton Park Regeneration Area
• The area will provide for approximately 1,025 dwellings and supporting community facilities.
• It has been identified through the Birkenhead 2040 Framework that the regeneration of this area will assist with the realisation of proposals for the new waterside 'Vittoria Studios' development by Peel L&P.
• The policy includes a range of criteria to guide development and makes specific reference to the Britannia Masterplan area and mixed-use employment led neighbourhoods.

Policy RA11:New Ferry Regeneration Area
The New Ferry Regeneration area will include the local centre as the focus for mixed-use retail and commercial led development along with the integration of up to 109 dwellings and community services. • The policy includes development criteria for development proposals within the area with a specific focus on Central New Ferry and former car parks.

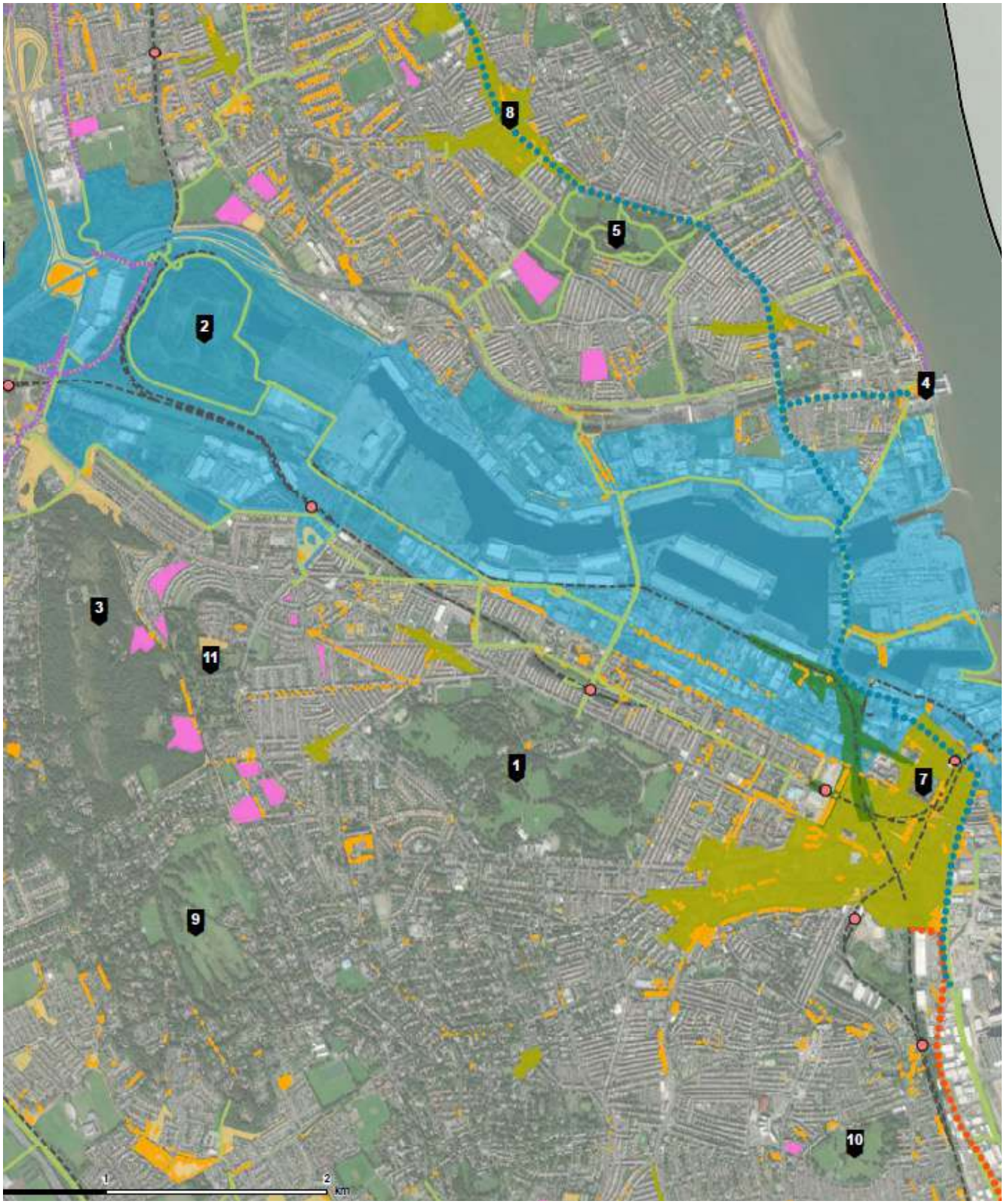
SETTLEMENT AREA 2:
BIRKENHEAD COMMERCIAL CORE

A comprehensive regeneration framework of national significance for Birkenhead (the Birkenhead 2040 Framework) has been approved by the Council to support the regeneration of this area, to reflect the pressing needs and strategic priority of promoting new housing and employment development and investment into Birkenhead.

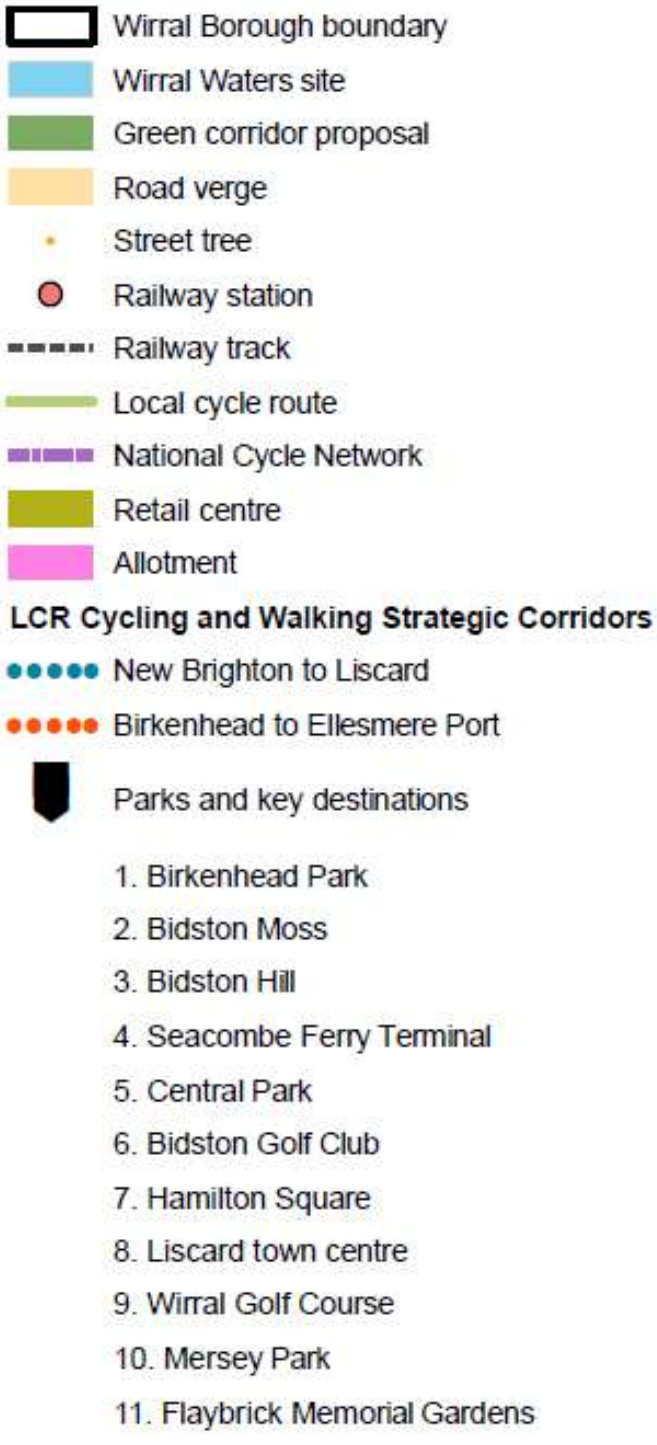
Policy WP2 for Birkenhead Commercial Core

- Sets out proposals for the comprehensive regeneration of central Birkenhead across eight regeneration areas as shown on the Map.
- Policy WP2 includes a policy for the Hamilton Square Conservation Area and allocates two sites for employment development.

WIRRAL LOCAL PLAN 2021 – 2037
SETTLEMENT AREA 2: BIRKENHEAD COMMERCIAL CORE

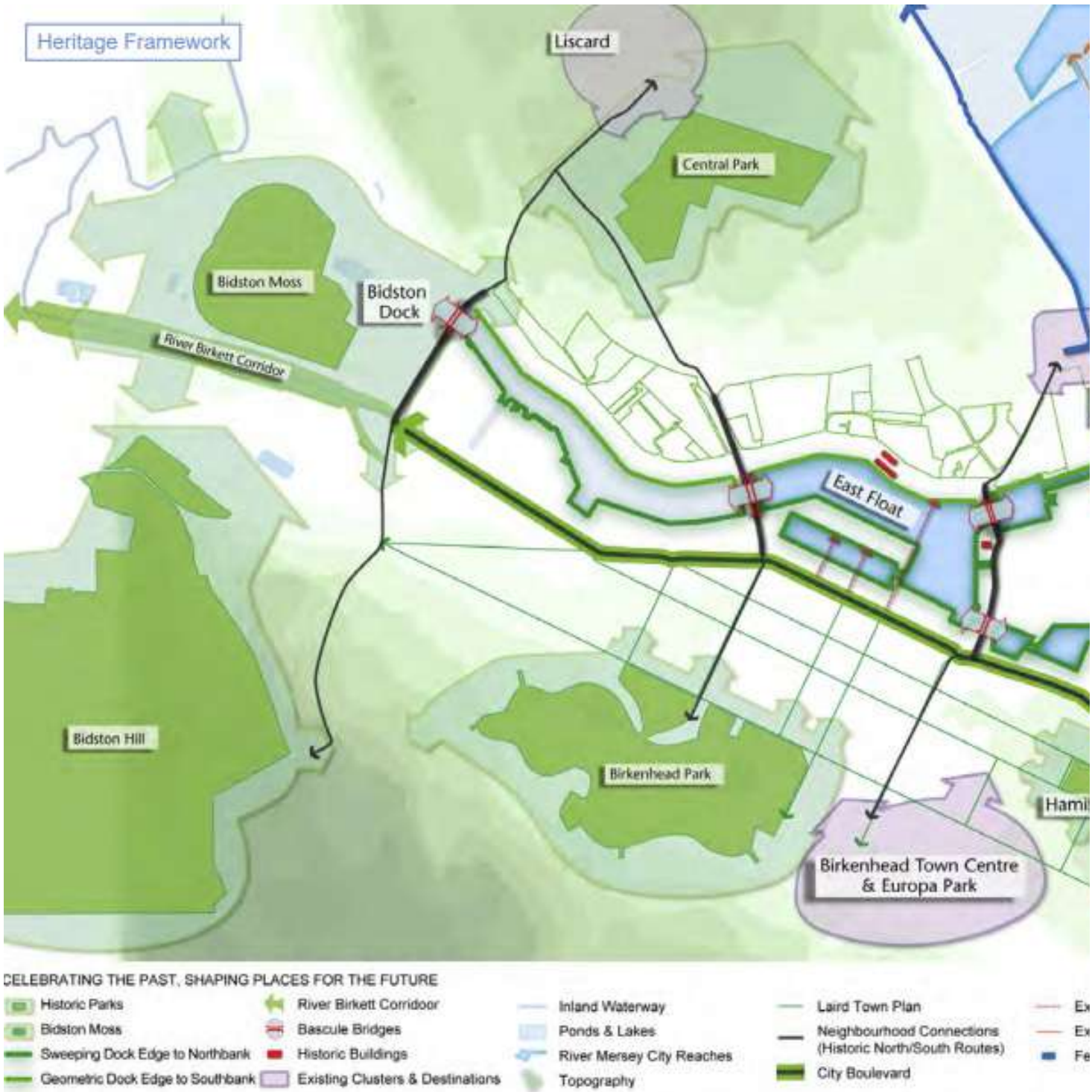

8
5
2
4
3
11
1
7
9
10
1
2
km

Green and Blue infrastructure along “The Great Float”




M53
A59
CENTRA
PARK
BIDSTON
MOSS
WEST
FLOAT
BIRKENHEAD
NORTH STATION
BIRKENHEAD
PARK STATIO
BIRKENHEAD
PARK

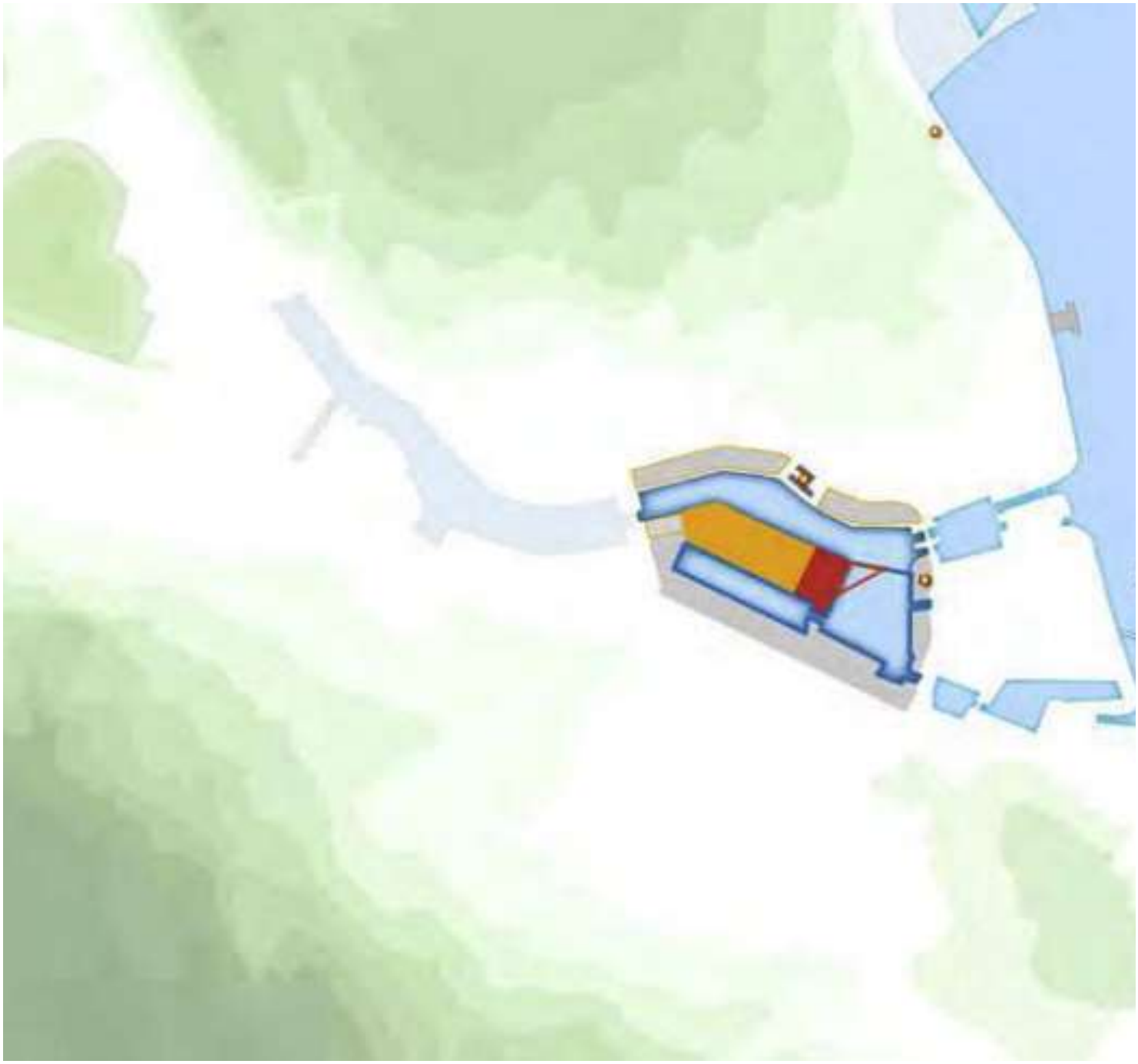
Wirral Waters Masterplan


Heritage Framework
Liscard
Central Park
Bidston Moss
Bidston Dock
River Birkett Corridor
East Float
Bidston Hill
Birkenhead Park
Birkenhead Town Centre & Europa Park
CELEBRATING THE PAST, SHAPING PLACES FOR THE FUTURE
Historic Parks
Bidston Moss
Sweeping Dock Edge to Northbank
Geometric Dock Edge to Southbank
River Birkett Corridoor
Bascule Bridges
Historic Buildings
Existing Clusters & Destinations
Inland Waterway
Ponds & Lakes
River Mersey City Reaches
Topography
Laird Town Plan
Neighbourhood Connections (Historic North/South Routes)
City Boulevard

Wirral Waters Vision Statement 2010 – C
Heritage framework

We want to create one river with two internationally recognised waterfronts, with world renowned skylines, signature buildings, public realm and events.

Our city waterfront will face in all directions - to the River Mersey 'City Reaches' and Liverpool waterfront to the east, to the lush wetlands, woodlands and coastlines to the west, the residential neighbourhoods to the north and Birkenhead Park, Birkenhead Town and Europa Boulevard to the south.



Wirral Waters Vision Statement 2010 – C
City signatures

The setting and scale of the Great Floats provides an ideal location to create a new cityscape of international profile. The setting within the River Birket valley requires a tailored approach, able to contrast with other international city skylines and tall building clusters that have evolved along riverbanks overlooking wide rivers – including the Liverpool waterfront.

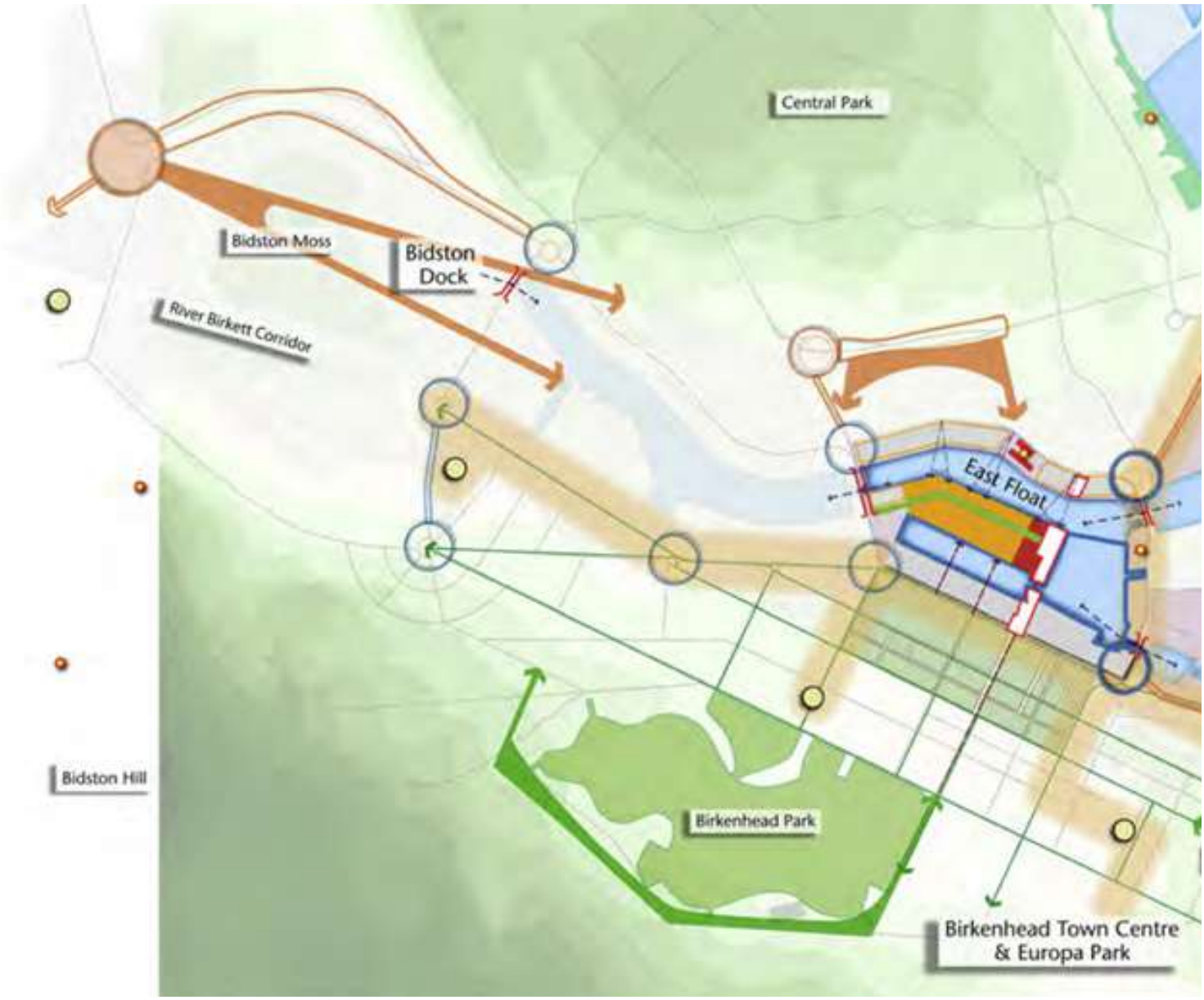
Within East Float, Vittoria Wharf forms a central 'peninsula' orientated towards the River Mersey. It stands alone, set amidst the scale and grandeur of the open water of the Float and against the backdrop of the River Birket and wider Wirral peninsula. It is ideal as the centrepoint for a new city skyline connecting the Wirral Peninsula to the River Mersey waterfront.

New city skylines shaped by the introduction of immediately recognisable buildings and structures act as beacons of regeneration and bring new identities that displace historic perceptions.

Wirral Waters Vision Statement 2010 – C
Animating the waters edge

Create a world class waters edge – a sequence of attractive, animated, well managed city squares and boardwalks capable of hosting international events and reconnecting to the River Mersey waterfront.

The Great Floats provide a truly unique experience, offering a more enclosed and contained setting in contrast to most other riverfront or seafront cities. The characteristics of the East Float and Vittoria Dock provide the opportunity to create waterside experiences to complement those emerging in Liverpool.


Central Park
Bidston Moss
Bidston Dock
River Birkett Corridor
East Float
Bidston Hill
Birkenhead Park
Birkenhead Town Centre & Europa Park

Wirral Waters Vision Statement 2010 – C Cityscape Framework

Define Wirral Waters as an International and European destination through the creation of an unrivalled 21st Century lifestyle offer, capable of attracting a wide spectrum of new markets.

Create places of distinction, contrast and innovation, offering a vibrant mix of living, working, leisure and cultural experiences to complement existing locations and offers.

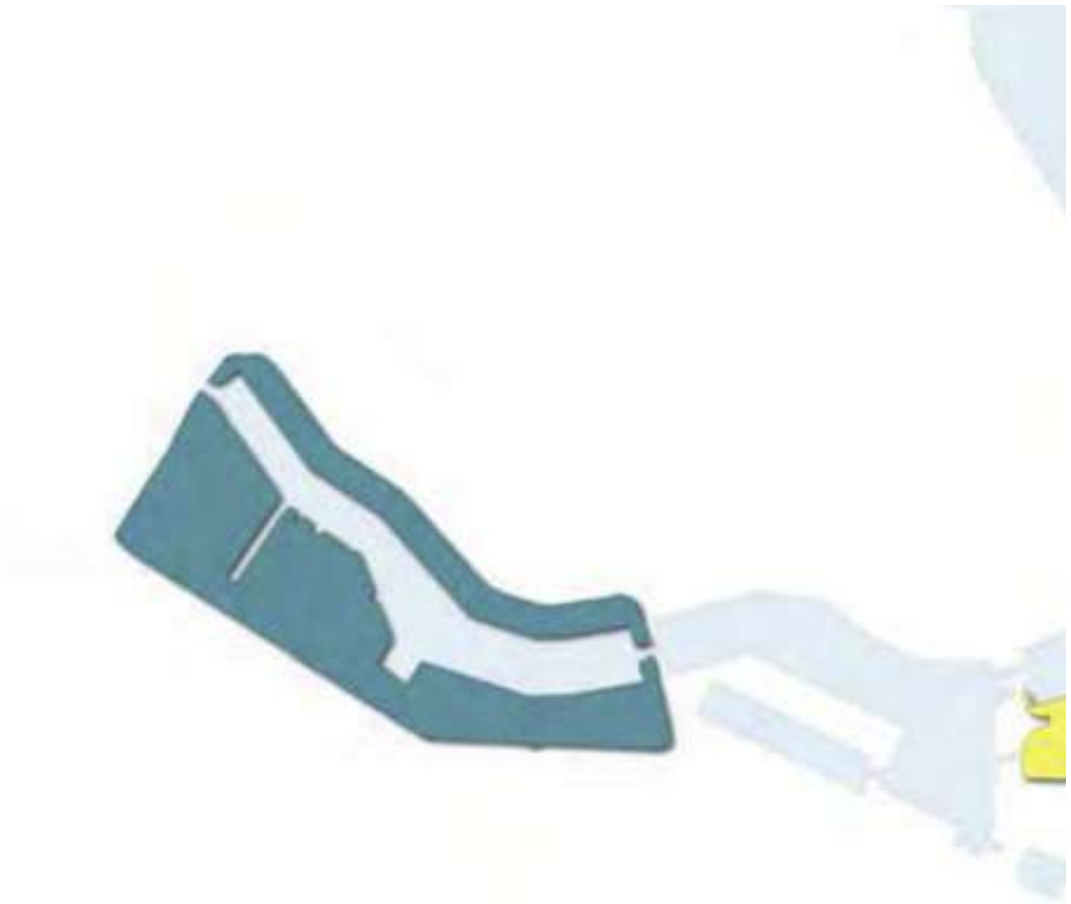
In particular, we want to achieve a scale, critical mass and momentum of development through catalyst neighbourhoods capable of delivering a transformational shift in perceptions and triggering the regeneration of wider partnerships, neighbourhoods and communities

Wirral Waters Vision Statement 2010 – C
Shaping the future of partnership neighbourhoods

Proposed neighbourhoods across Wirral Waters and its immediate setting as the framework for future regeneration.

East Float and Bidston Dock are 'catalyst' neighbourhoods, the focus for significant investment and change.

The vision is to shape clear roles for 'partnership' neighbourhoods – to deliver a more diverse employment portfolio and 'lifetime' neighbourhoods offering a choice of homes and tenures.



Wirral Waters Vision Statement 2010 – C
Prosperous port

East Float is a crucial part of the Wirral Waters development.

West Float will serve as the hub for operational port activities, supporting Birkenhead and Wallasey Docks, as well as the 12 Quays Roll On – Roll Off Ferry Terminal.

Commercial vessels will access West Float through Alfred Lock and East Float, adding vibrancy to the dock complex.

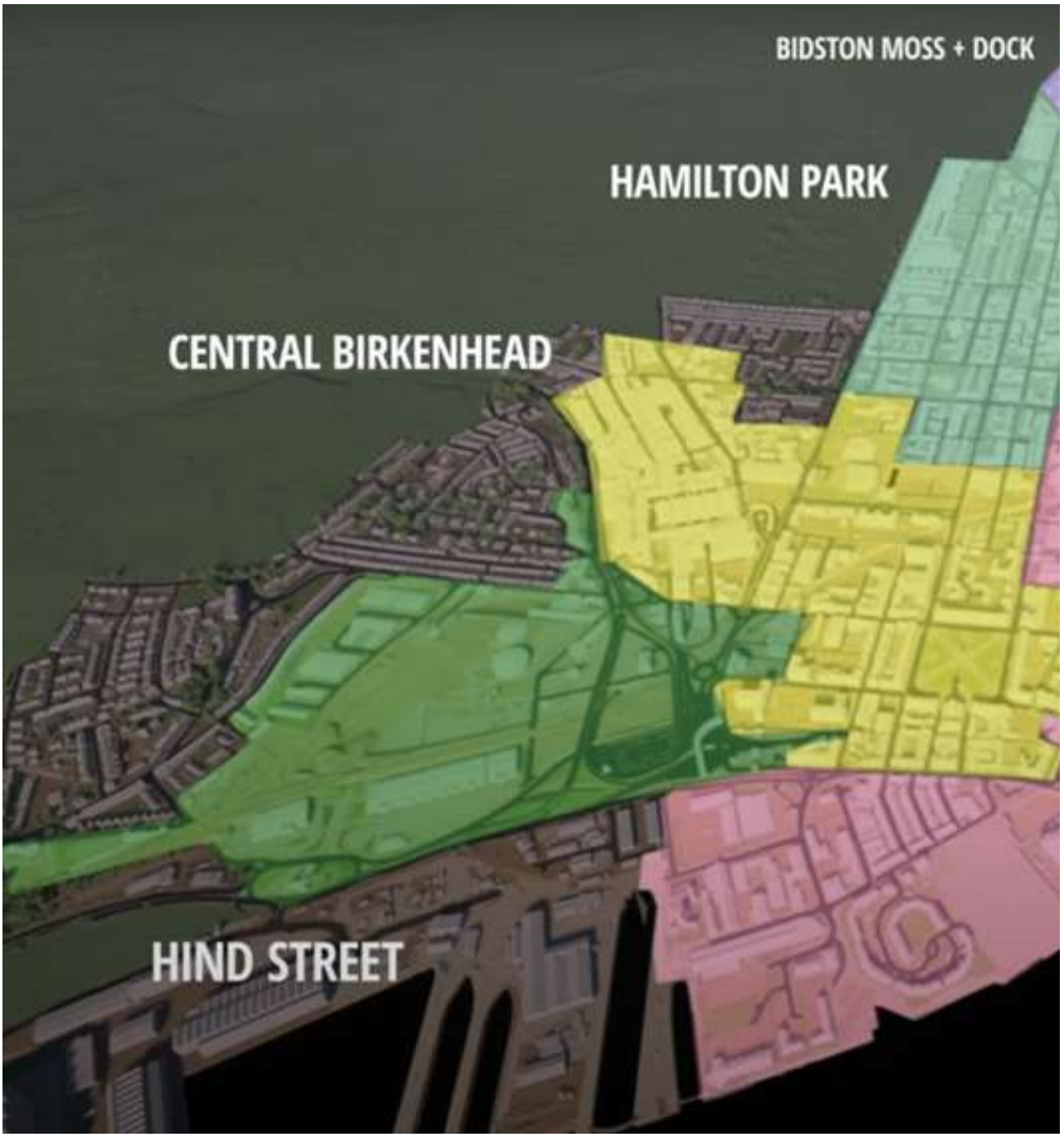
This passage of ships will be a distinctive feature of the new waterside quarters.

Restructuring West Float provides an opportunity to potentially relocate businesses, particularly those needing direct water access.
The focus is on dockside sites for port-related activities, ensuring the maritime economy remains strong.
Peel Ports, a part of the Peel Group, owns and operates the Ports of Liverpool, Birkenhead, and MSC, marking the first time these ports are under one company's ownership.

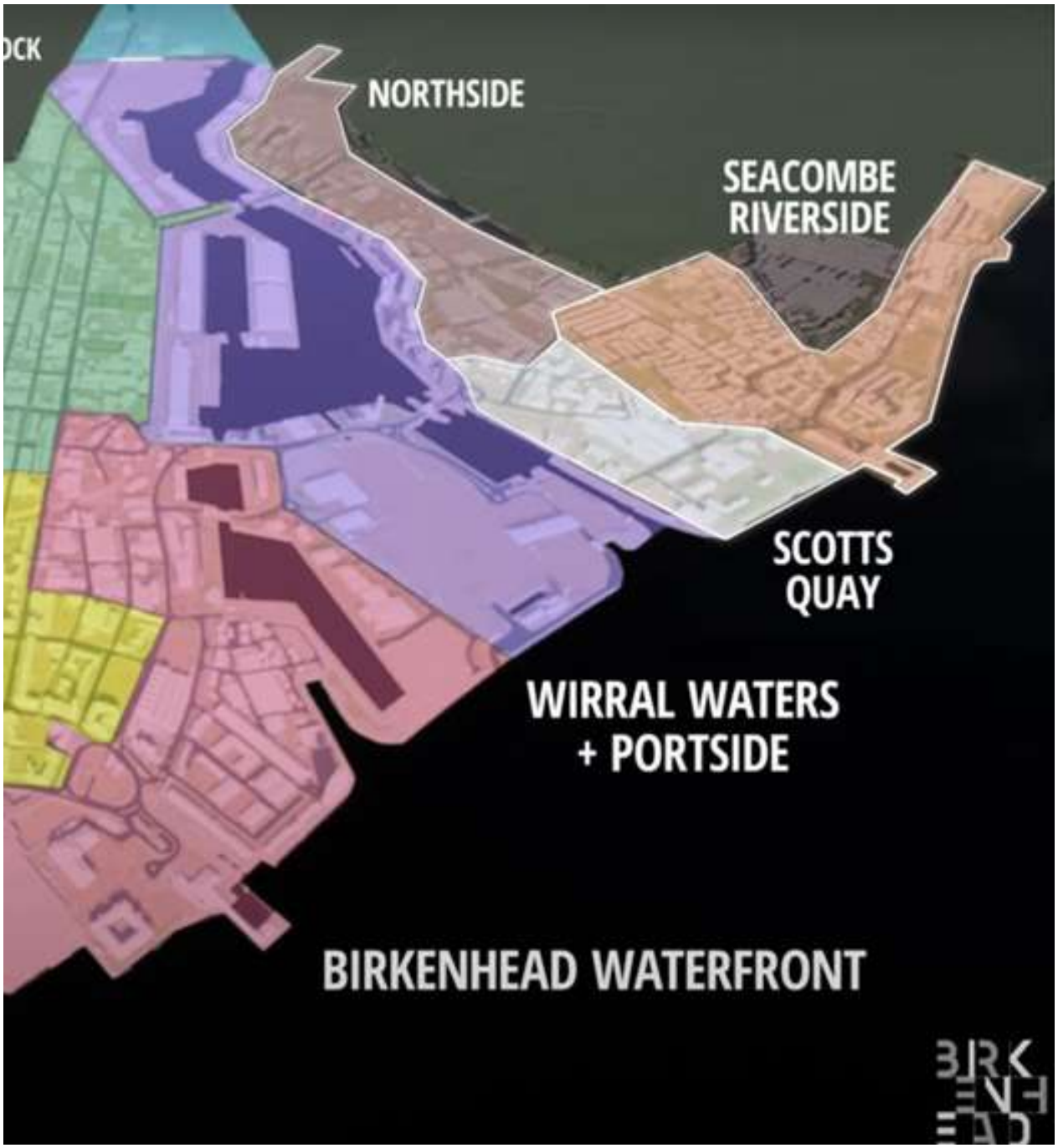
Wirral Waters Vision Statement 2010 – C
Parklife and the waters edge

Create a world class waters edge – a sequence of attractive, animated, well managed city squares and boardwalks capable of hosting international events and reconnecting to the River Mersey waterfront.

The Great Floats provide a truly unique experience, offering a more enclosed and contained setting in contrast to most other riverfront or seafront cities. The characteristics of the East Float and Vittoria Dock provide the opportunity to create waterside experiences to complement those emerging in Liverpool.


BIDSTON MOSS + DOCK
HAMILTON PARK
CENTRAL BIRKENHEAD
HIND STREET

Birkenhead 2040 regeneration framework




WIRRAL WATERS

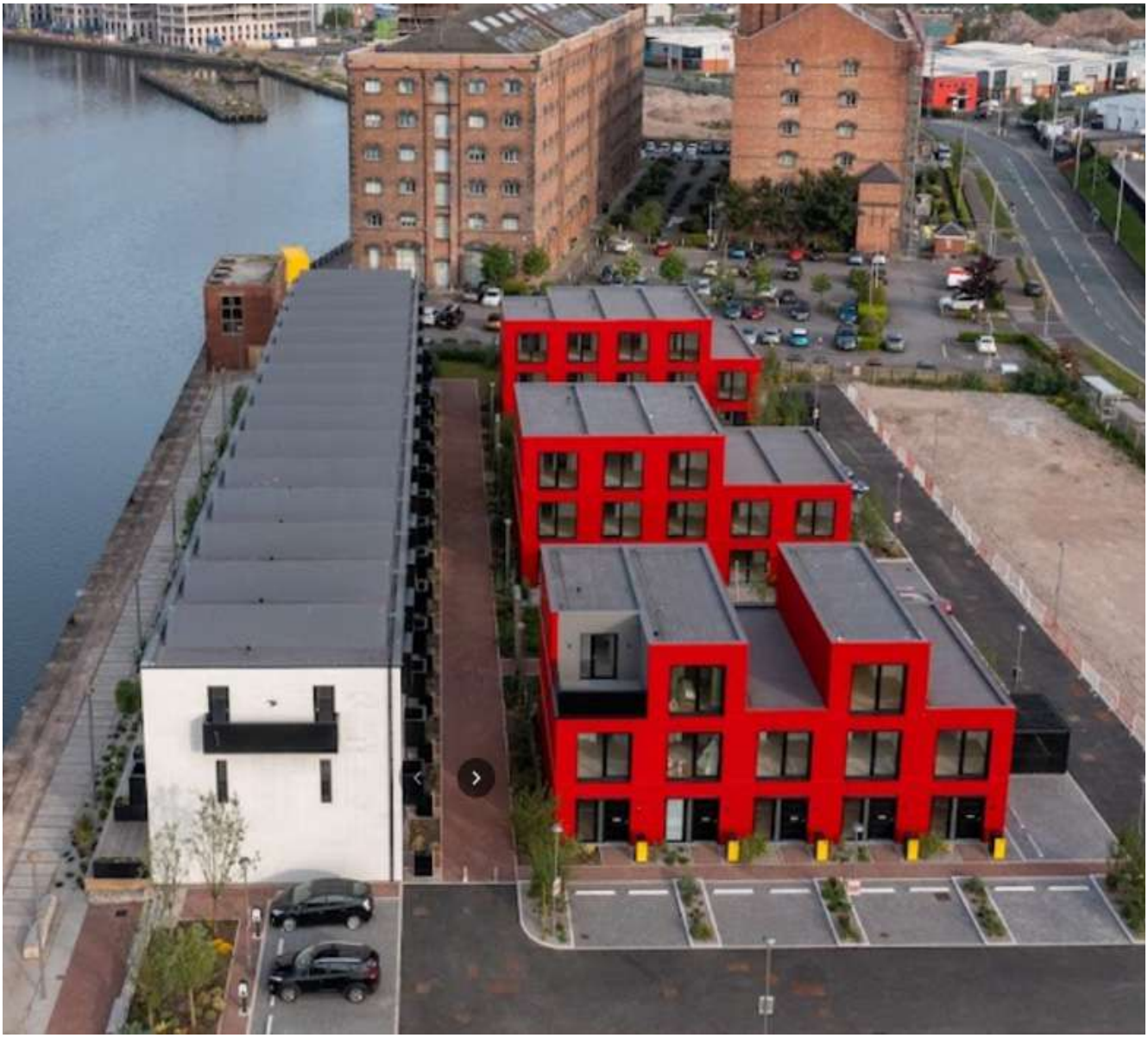
Birkenhead 2040 regeneration framework (Wirral Waters)

Envisaged Development Visions Along Waterfronts


12

Envisaged Development Visions Along Waterfronts
Millers Quay

Envisaged Development Visions Along Waterfronts
Red Bridge Quay



With all the attractions of the Wirral Peninsula Village lifestyle...

And the drama of being at the waters edge 'on the bay'...

Lush City Waterfronts with 'Room to Breathe' - Precedent Images

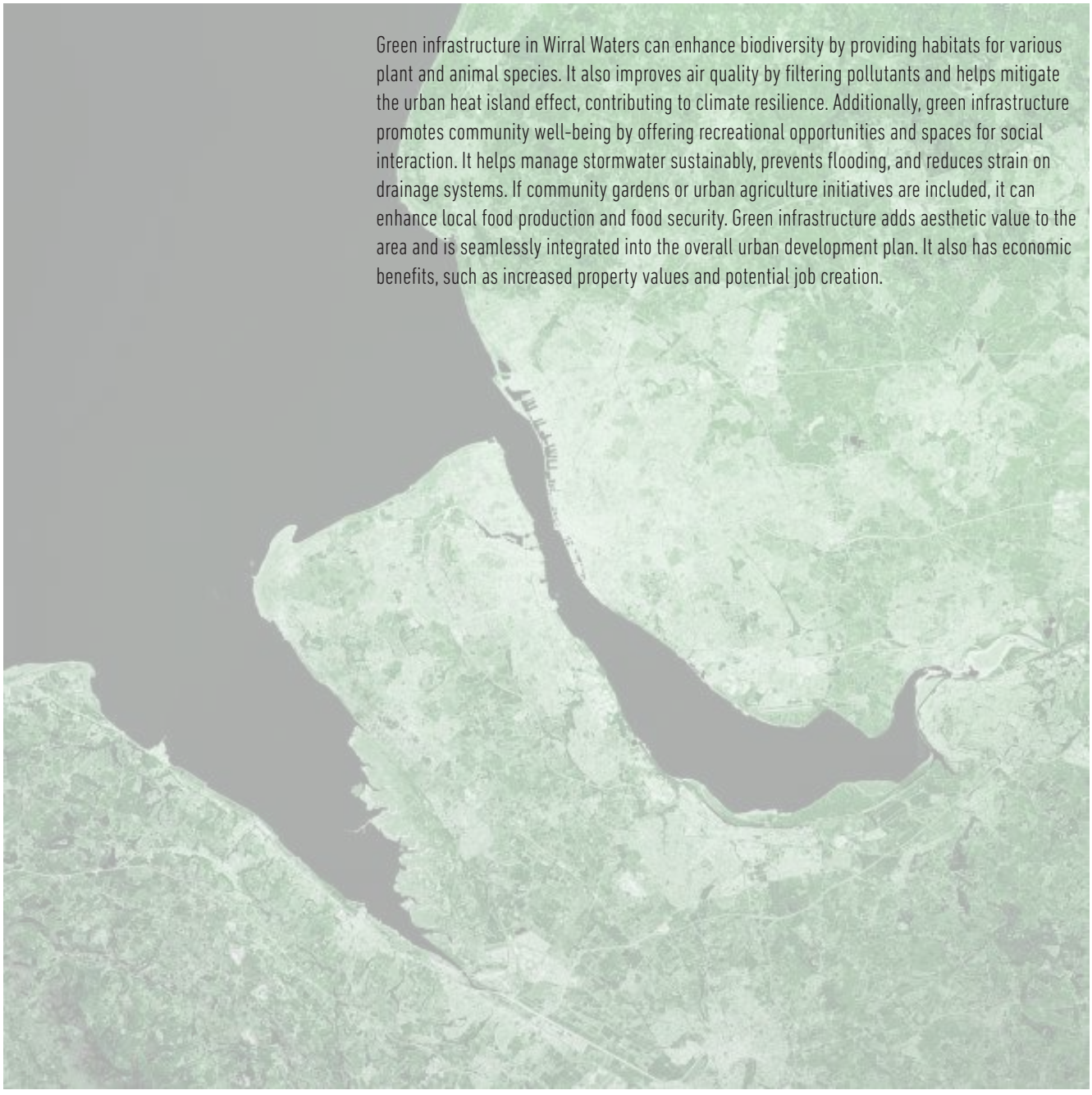
Waterfront – Northbank masterplan 2018

CONCLUSIONS

- The 'Great Floats' of Wirral Waters is unique. They remain as a powerful reminder of the historic role of docks as a seam of innovation and enterprise, connecting the surrounding neighbourhoods (and their infrastructure) together.
- Large water (dock)area, almost no significant key destination /attraction points close to waterline of Wirral Waters.
- The view from Liverpool to the existing development of Wirral Waters quite horizontal, without significant vertical dominants.
- The ambitious aims of Wirral Waters developers align with the development strategies formulated by the Wirral municipality.
- Over the years, biodiversity (e.g., in rivers) has significantly improved due to various preventive measures implemented for the protection and enhancement of water bodies.
- On the peninsula, there are significantly diverse biologically protected water plant zones along the water's edge, which can influence various architectural design conceptual proposals and their proposed placements.
- The water area within Wirral Waters is extensive, yet the allocation of space for recreational or public outdoor areas along the docks remains relatively modest.
- Celebrating the past, shaping places for the future

R2

Birkenhead
Green Structures



Green infrastructure in Wirral Waters can enhance biodiversity by providing habitats for various plant and animal species. It also improves air quality by filtering pollutants and helps mitigate the urban heat island effect, contributing to climate resilience. Additionally, green infrastructure promotes community well-being by offering recreational opportunities and spaces for social interaction. It helps manage stormwater sustainably, prevents flooding, and reduces strain on drainage systems. If community gardens or urban agriculture initiatives are included, it can enhance local food production and food security. Green infrastructure adds aesthetic value to the area and is seamlessly integrated into the overall urban development plan. It also has economic benefits, such as increased property values and potential job creation.

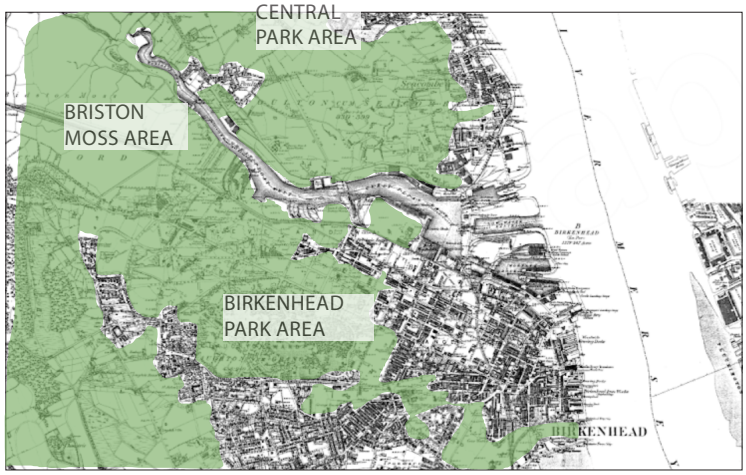
WIRRAL WATERS TODAY

Wirral Waters located on left bank of Liverpool is known for its industrial strength, but it is now focusing on creating a sustainable and pleasant urban environment. Today Wirral Waters has made an effort to include green spaces throughout its landscape, as research shows that access to nature can improve mental health and overall well-being. Birkenhead has intentionally incorporated parks, recreational areas, and green corridors to promote a healthier urban lifestyle.

As we move closer to the river, the value of green spaces becomes more important. Wirral Waters, located on the River Mersey, combines urban development and natural landscapes in a harmonious way. Waterfronts play a significant role in improving the urban experience, as research has shown that being near water positively impacts mental well-being. The green spaces along the riverside in Wirral Waters not only look nice but also have a positive effect on the health of those who live and visit there.

HISTORICAL CONTEXT - GREEN DEVELOPMENT TROUGH TIME

1880



Industrialization and Early Urbanization

In the late 19th century, Wirral Waters might have been characterized by industrialization, with manufacturing and port activities dominating the landscape.

Green spaces were likely limited, and the focus was on economic development rather than environmental considerations.

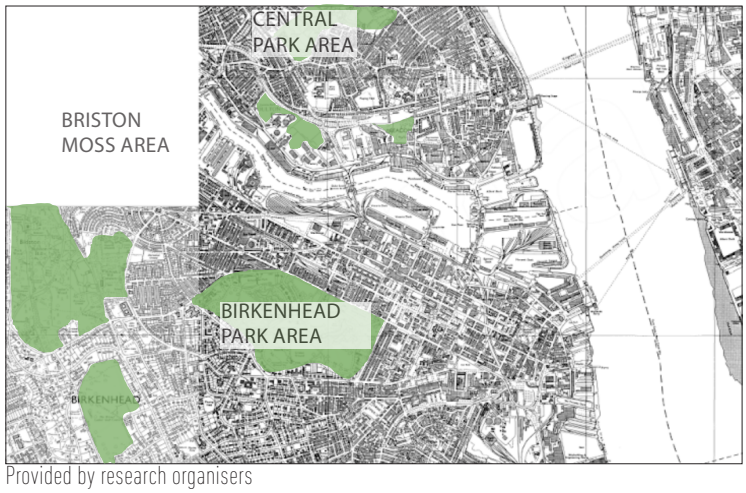
1950

Post-War Era

The post-war era witnessed increased urbanization and the reconstruction of many areas affected by conflict.

The Wirral Waters territory might have experienced further industrialization during this time, but there could be some planning for residential areas and public spaces.

1980



Transition Period

The 1980s could have seen a shift towards more diverse land use, with an increasing focus on planning regulations, environmental considerations, and public amenities.

Some brownfield areas might have been repurposed for green spaces or mixed-use developments.

Provided by research organisers

Wirral Waters Vision Statement 2010

WIRRAL WATERS SPATIAL STRATEGY

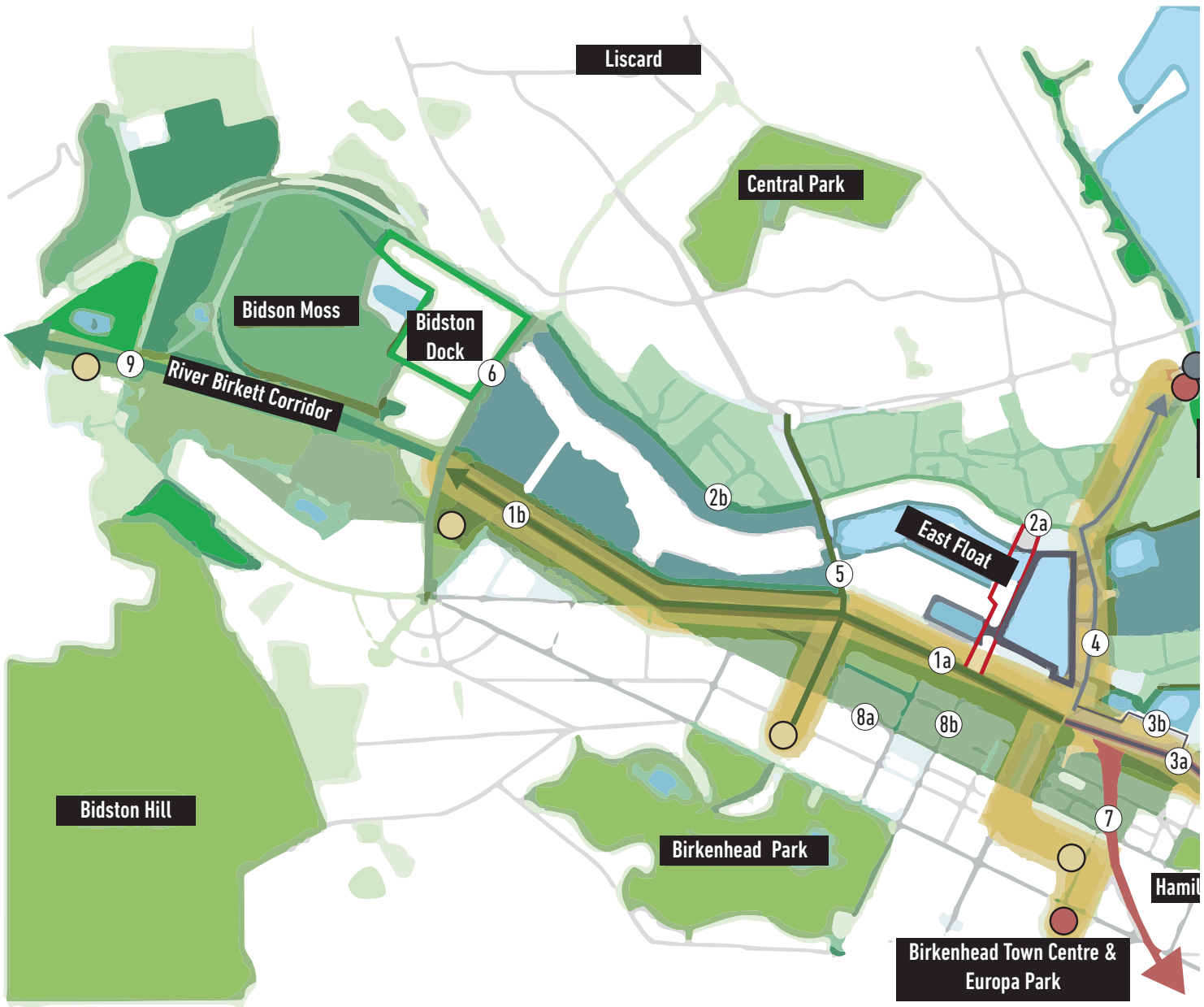
Wirral Waters area is very careful about creating landscape and environment sustainable. They have a spatial plan highlighting green spaces and nature in the area. They have things like gardens and trees to make it a nice place for people to live. This is because they believe that being close to nature makes people feel better.

Make responsible use of land and natural resources to mitigate and adapt to climate change and enhance natural carbon stores Strategic and promote the transition to a low carbon Borough and circular economy, reusing and ecycling waste and minerals.

Protect and enhance the connectivity, quality and accessibility of urban and rural green space, and multifunctional green and blue infrastructure. Protect nature by ensuring development delivers measurable net gains for biodiversity and the blue and green infrastructure network continues to grow.

Reduce social, economic and environmental deprivation, especially in the eastern part of the peninsula, through development that achieves social value in housing renewal, reducing unemployment, improving skills, education, community and environmental conditions including maintaining good air quality for good health.

WIRRAL WATERS STRATEGY FOR TOMORROW



EXISTING CITY STRUCTURE

- Train Station
- Bus Station
- Ferry Station
- Public Realm
- X
- Underlying City Structure
- River Mersey City Reaches
- Inland Waterways
- Local Greenspace
- Western Approaches
- River Birket Corridor
- City Parks

PROPOSED CITY STRUCTURE

- 1a City Boulevard East
- 1b City Boulevard West
- 2a Northside Boulevard East
- 2b Northside Boulevard West
- 3a Woodside Boulevard
- 3b Egenton Route
- 4 Tower Road (Parkway)
- 5 Duke Street (Parkway)
- 6 Poulton Bridge (Parkway)
- 7 Courway Park Curves
- 8a Town Boulevards East-West (Laid Town Plan)
- 8b Town Boulevards North-South (Laid Town Plan)
- 9 Western Approaches - River Birkett

CATALYST NEIBORHOODS

- Green Infrastructure within New Development
- Strategic Public Realm
- Northbank
- Victoria Dock
- Victoria Pool

PARTNERSHIP NEIBORHOODS

- Green Grid
- Working Woodlands
- Operation Port: urban woodland opportunities

WIRRAL WATERS TODAY - ENGLISH WOODLAND GRANT SCHEMES

The Woodpasture and Parkland Biodiversity Action Plan in England aims to protect and improve semi-natural landscapes that have a combination of open grassland and scattered trees. These habitats are important for biodiversity and provide a home for a variety of species.

Woodland

In Wirral Waters, incorporating Woodpasture and Parkland elements in the landscape design can improve biodiversity, ecological resilience, and create a sustainable and visually appealing urban environment. This may include preserving scattered trees, open grassland, and adopting management practices that support the unique features of this important habitat.

Woodposture and Parkland BAP Priority Habitat

Priority Habitat Inventory - Deciduous Woodland

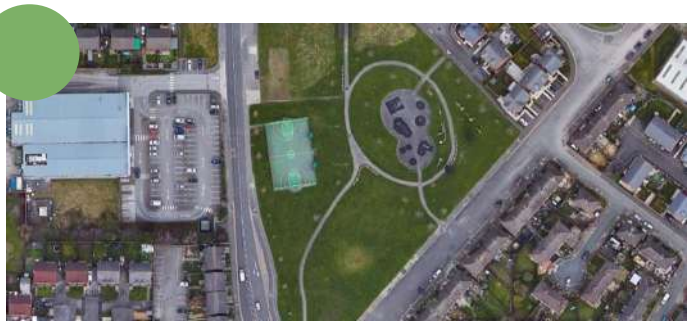
OTHER TYPES OF GREEN STRUCTURES

Footbal / Rygby fields

28 footbal / rugby fields

Cricket fields

4 cricket fields



Green playground / park areas

10 park / playground areas

Tennis areas

5 tennis cort areas.

Playground areas

11 park areas

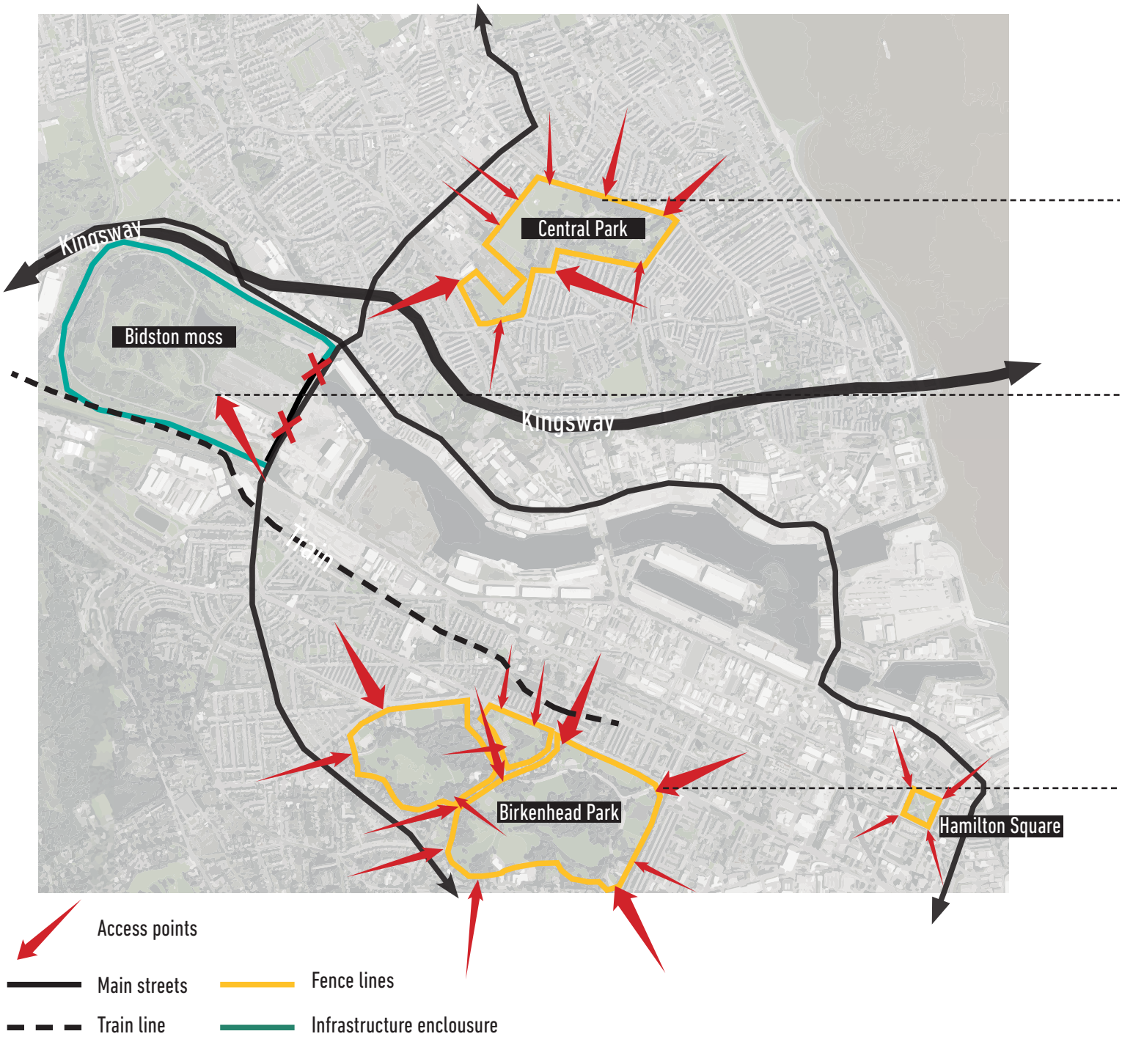
EXISTING GREEN – COMMUNITY GARDENS

CENTRALPARKCOMMUNITYGARDENS

POULTONAREACOMMUNITYGARDENS

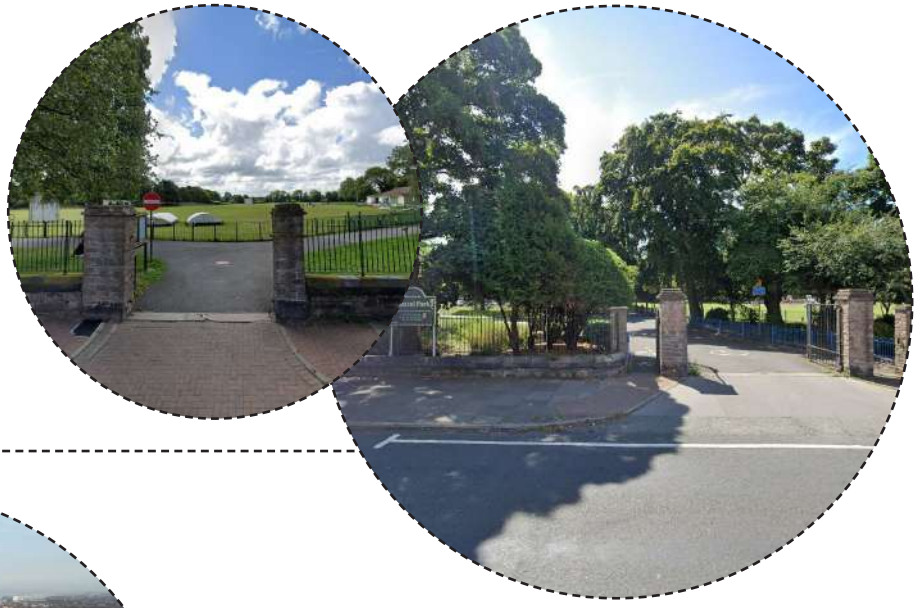
EDWARDKEMPCOMMUNITYGARDENS

EDGE CONDITION



Central Park

Central park is mostly gated, with multiple access points. This is common for parks to have developed gated. Surrounded with residential neibhourhoods, Central Park serves as main green space for North bank of Wirral Waters.



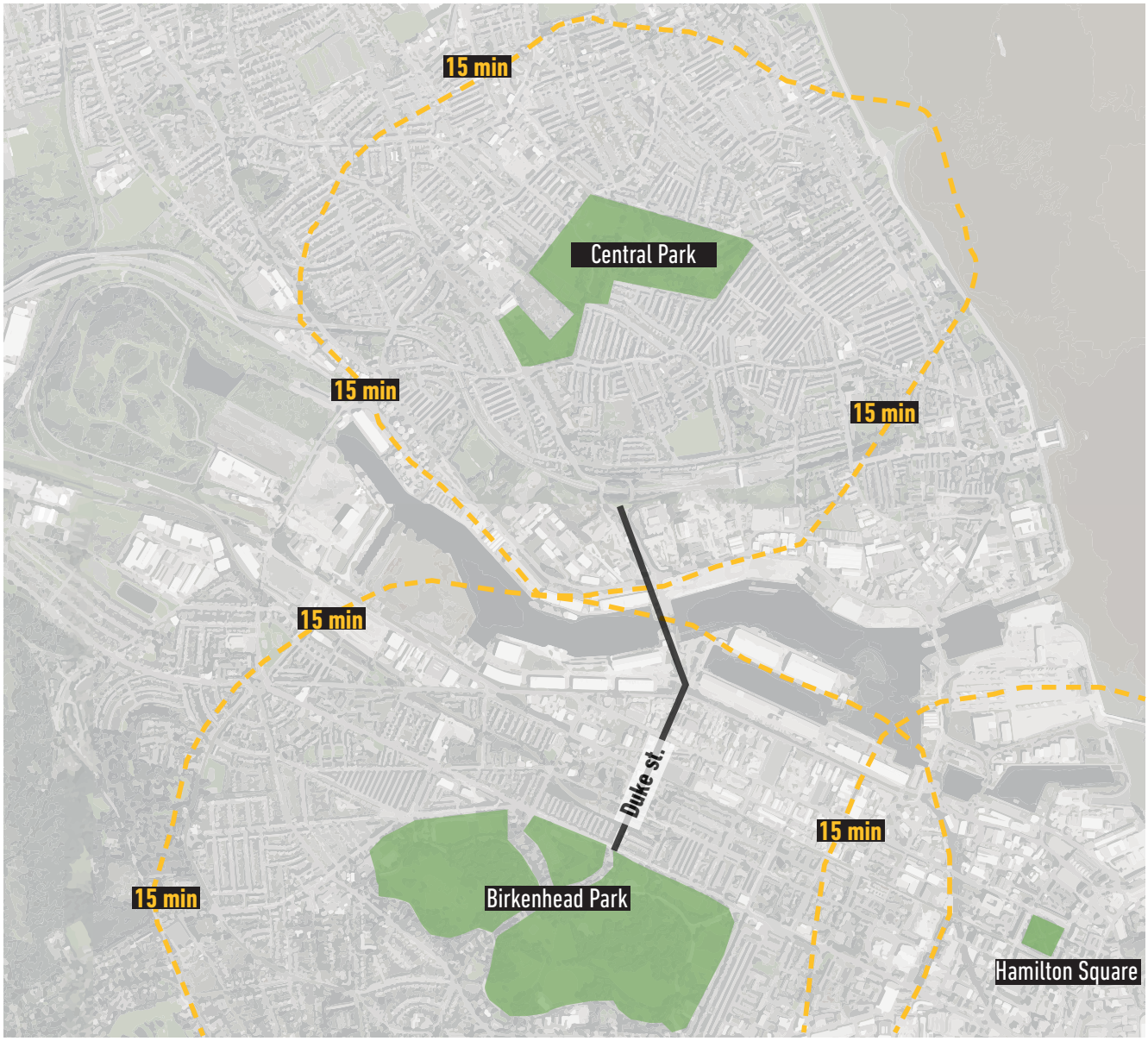
Bidston Moss

Is an area cut off by highway and train line, with limited access. However, Briston moss covers large area of Wirral Waters. Residents use this area for recreation and has potential for development.

Birkenhead Park

Birkhead park is gated with several access points. Along the park is fence line, with hedge works, tree lines etc. leading to gates.

15-MIN CITIES



Developed green spaces

Road west; Wallasey Bridge; Beaufort Road



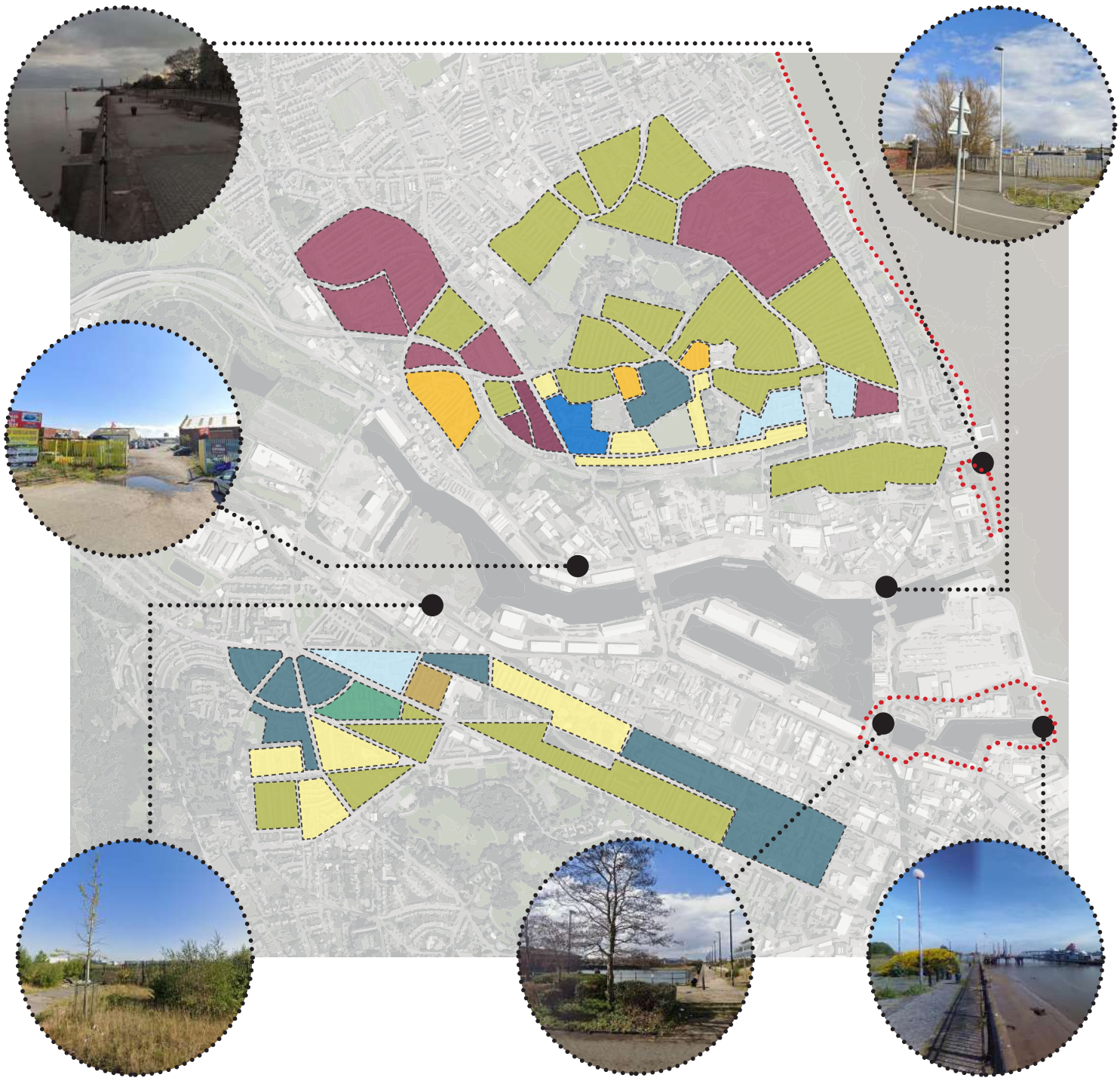



Duke Street South and Birkenhead Park area

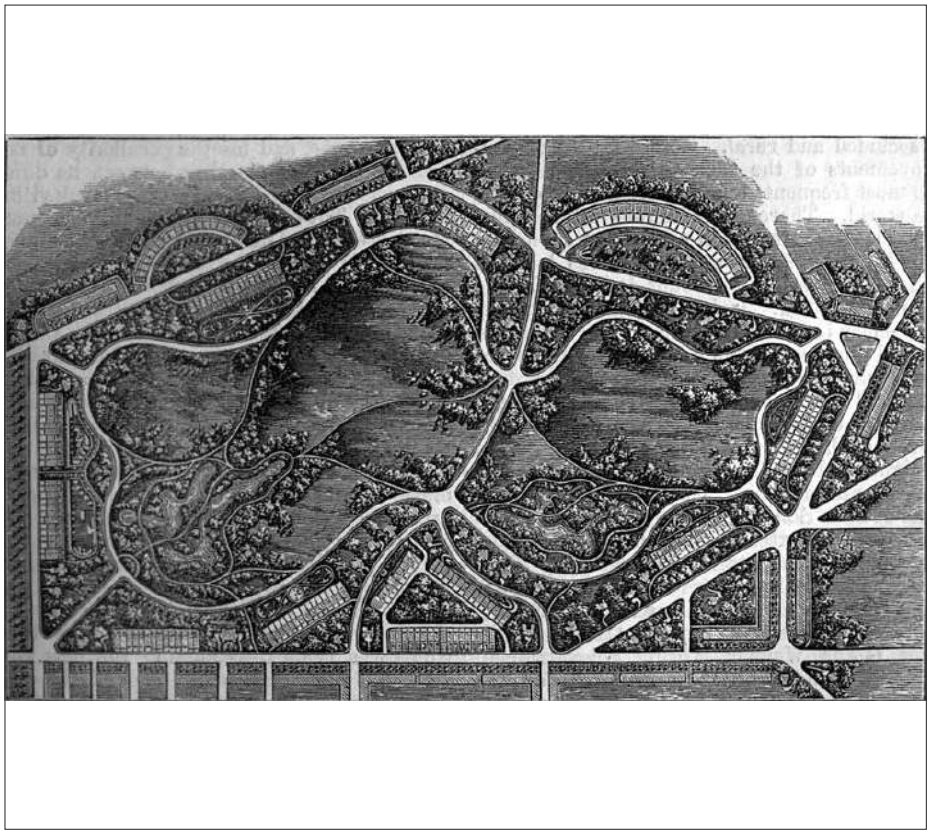




STREET TYPOLOGY MAP



LARGE GREEN ZONES



Birkenhead Park

Birkenhead Park in England is a stunning Victorian park that was one of the earliest parks to be funded by the public. It was created by Sir Joseph Paxton and has been a role model for urban parks around the globe since its establishment in 1847. Birkenhead park was influential on the design of public parks both in the UK and internationally and it is considered a landmark in the history of public parks.

In 1850, American landscape architect Frederick Law Olmsted arrived by ship in Liverpool. During his stay in Northwest England, he paid a visit to Birkenhead Park along with several other public gardens. He noted Birkenhead was "a model town" which was built "all in accordance with the advanced science, taste, and enterprising spirit that are supposed to distinguish the nineteenth century"

Bidston moss

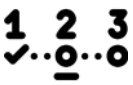
Bidston Moss is characterized by a diverse landscape and industrial areas. It has historically been an indust industrial activities. In recent years, there has been a Moss, incorporating sustainability and environmental

ndscape that includes a mix of wetlands, grasslands, n industrial site, with past uses including landfill and s been an effort to rehabilitate and redevelop Bidston mental considerations.

Central Park

Central Park, situated in the heart of Wallasey, is a serene haven that appeals to locals and visitors seeking respite from urban living. Offering a harmonious blend of recreational areas and natural beauty, the park offers a peaceful environment for unwinding and engaging in outdoor activities.The park offers a range of well-kept pathways and trails that meander through various areas, providing opportunities for jogging, walking, or biking. These routes enable visitors to stay active while also discovering the park's natural scenery.Wallasey Central Park is anticipated to offer a wide range of recreational amenities, including playgrounds, sports areas, and potentially a café or seating areas. As a result, the park is expected to become a popular destination for various activities, serving as a central meeting point for the community.

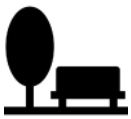
CONCLUSIONS ON WIRRAL WATERS GREEN SPACES



Wirral waters municipality has done thorough research on green space regeneration which highlights most issues;

Wirral Waters has unique historical context of Birkhead park, Hamilton Garden and Central park which makes these areas even more important to peserve and popularize;

Communities around Wirral Waters are active in perserving greenery;



Biston moss and hills are potential development areas for recreation;

Wide bio-diversity and great weather conditions for greenery;

RECOMMENDATION ON WIRRAL WATERS GREEN SPACES

It is recommended to create applicable steps for regenerating greenery and involving community into development;

Build upon the historical sense of areas to promote Wirral Waters as Green vision;

Leverage people led initatives in creating community gadens;

Implement temporary greenery tactics to create green corridors on existing roads to connect Biston Hills, Biston Mosh into existing green fabric of city;

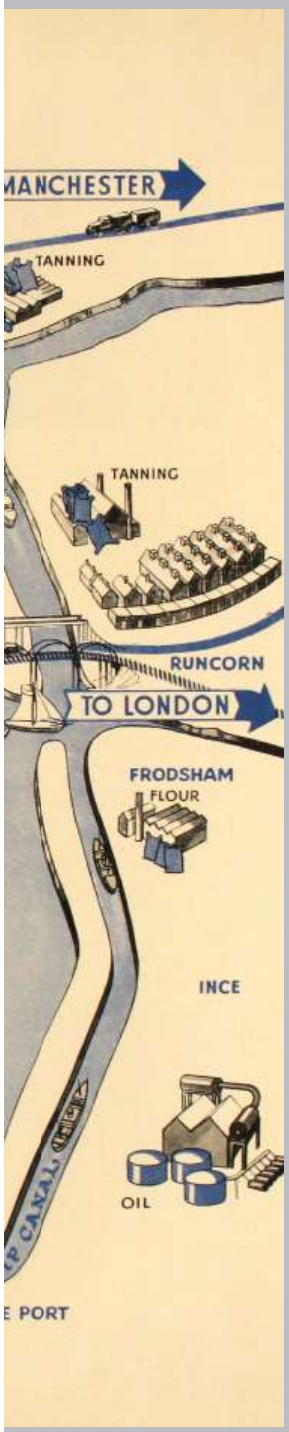
Preserve and improve on existing green spaces;

R3

BUILT STRUCTURES

HISTORY

History of area development



Birkenhead's history as a settled area dates back to the Medieval era, with the establishment of a Priory by Benedictine monks in 1150. However, significant development began in the early 19th Century when William and John Laird initiated the construction of an ironworks, later expanding into shipyards which eventually became Cammell Laird. The town's growth was further catalyzed in 1886 with the opening of the Mersey Railway tunnel, the world's pioneering sub-estuarial tunnel, linking Birkenhead to Liverpool and attracting additional investment.

Birkenhead also boasts the distinction of having Britain's inaugural street tramway, operational since 1860 initially with horse-drawn carriages, later electrified in 1901, and ultimately ceasing operation in 1937.

Renowned for its architectural heritage, Birkenhead proudly holds the second-highest number of Grade 1 listed buildings in England. Its streets are adorned with an array of architectural styles ranging from Gothic to Victorian, exemplified by structures like the Norman and Italianate sandstone lodges marking the entrances to Birkenhead Park.

Built up area historical development

1880s

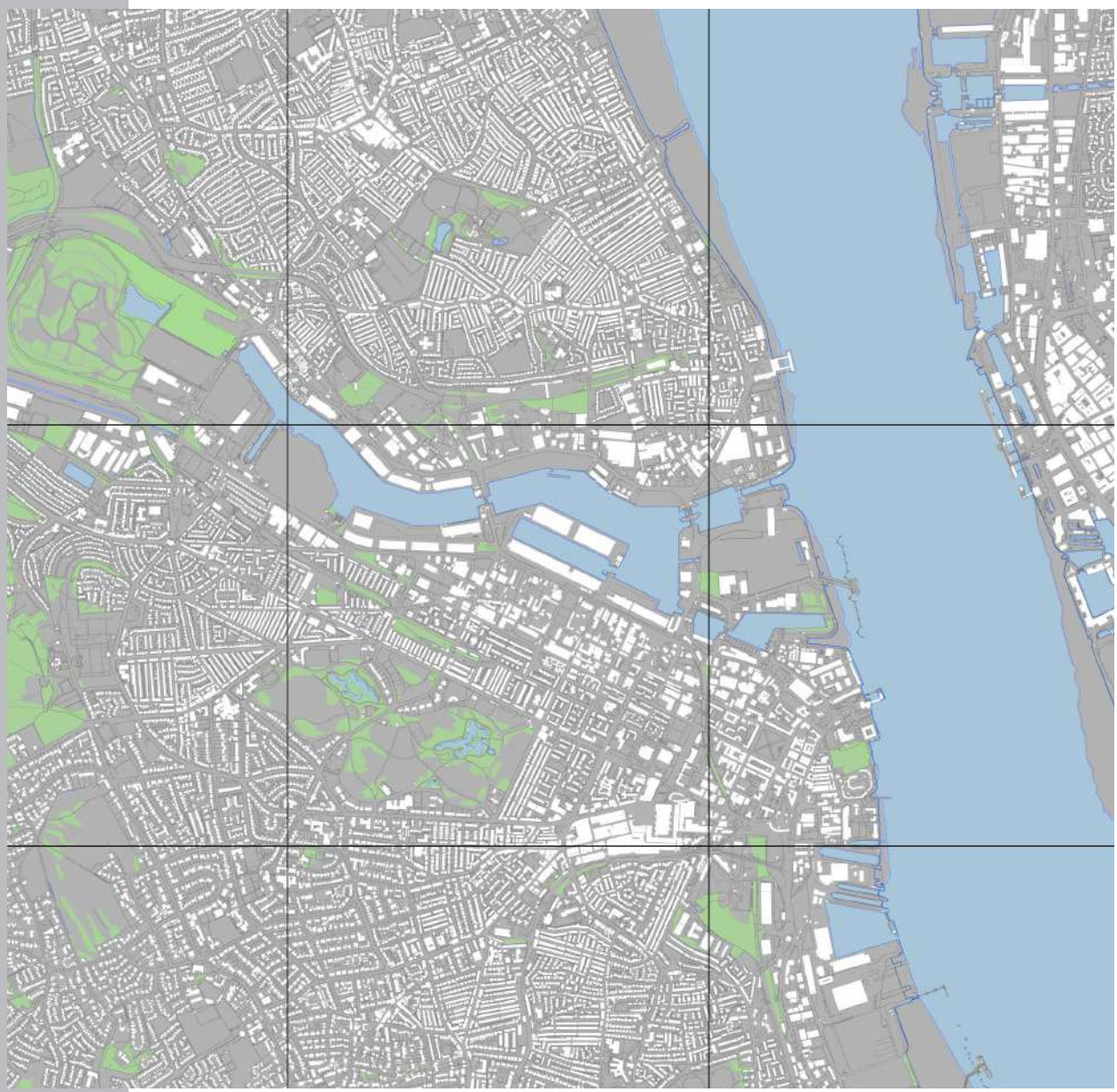
1910s

1930s

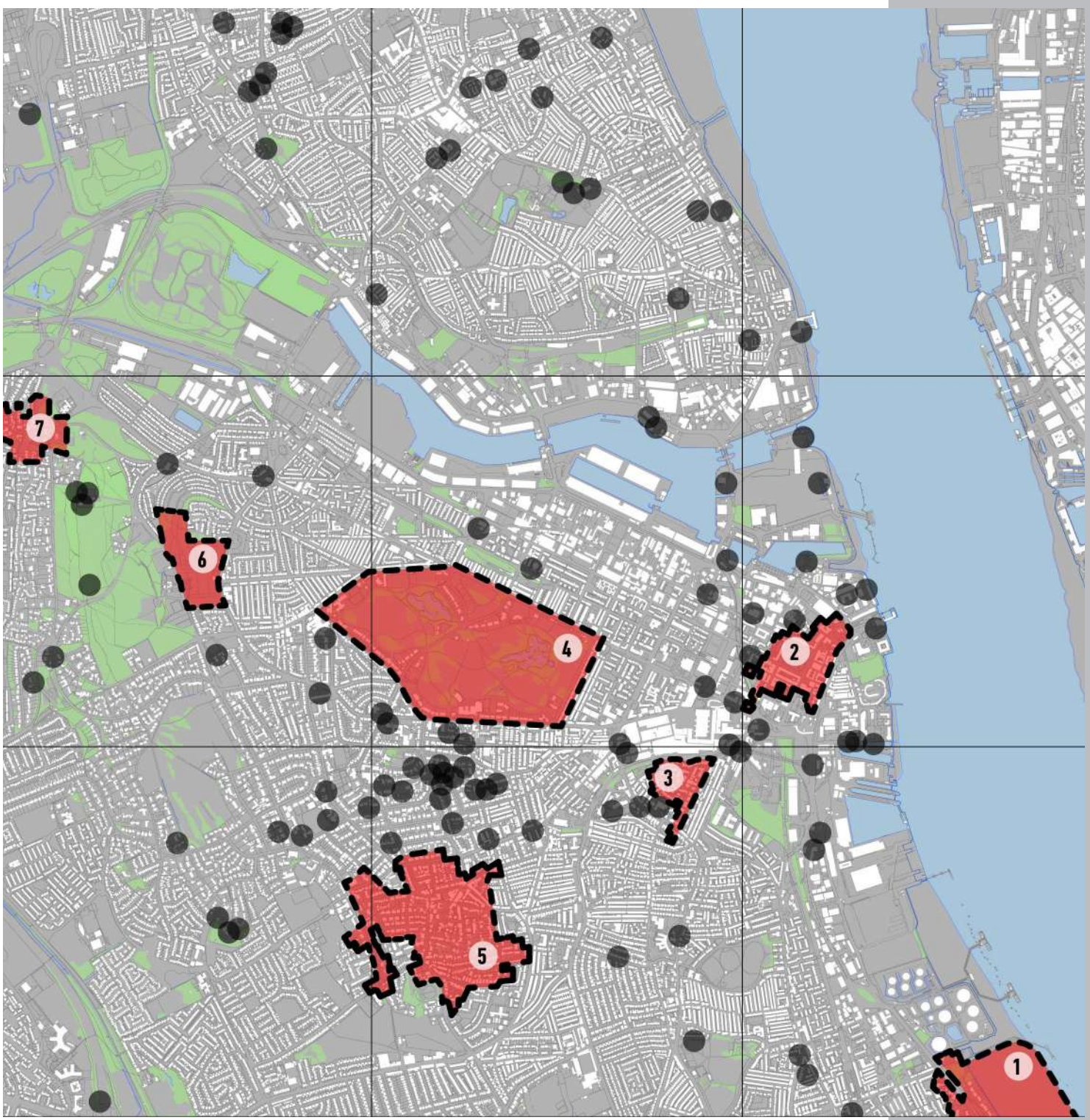
1950s

1960s

1980s



2020s


7
6
4
2
3
5
1

Conservation areas and Historical buildings

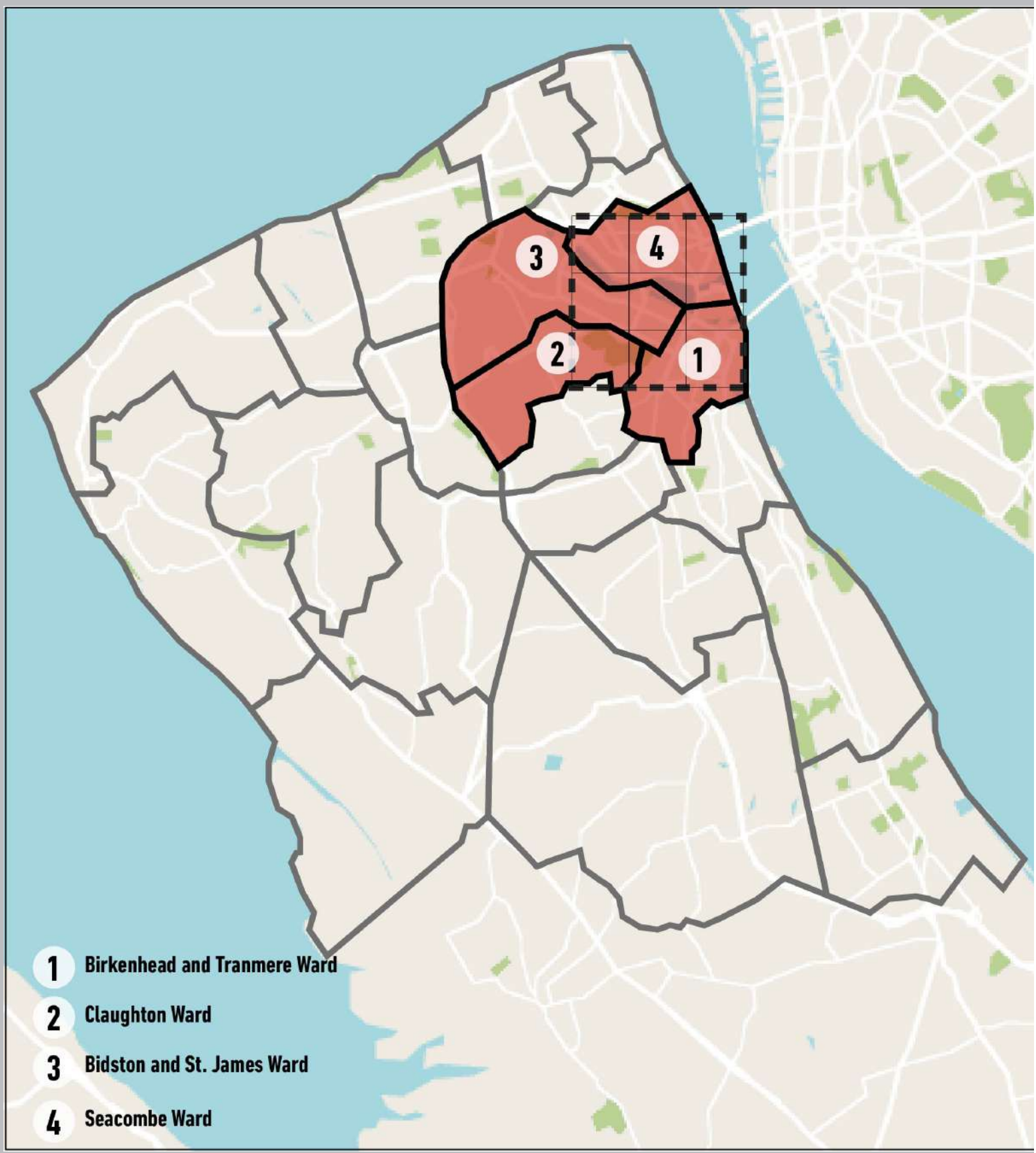
1. **Rock Park Conservation Area**
2. **Hamilton Square Conservation Area**
3. **Clifton Park Conservation Area**
4. **Birkenhead Park Conservation Area**
5. **Oxton Village Conservation Area**
6. **Flaybrick Hill Cemetery Conservation Area**
7. **Bidston Village Conservation Area**

● **Historical buildings**

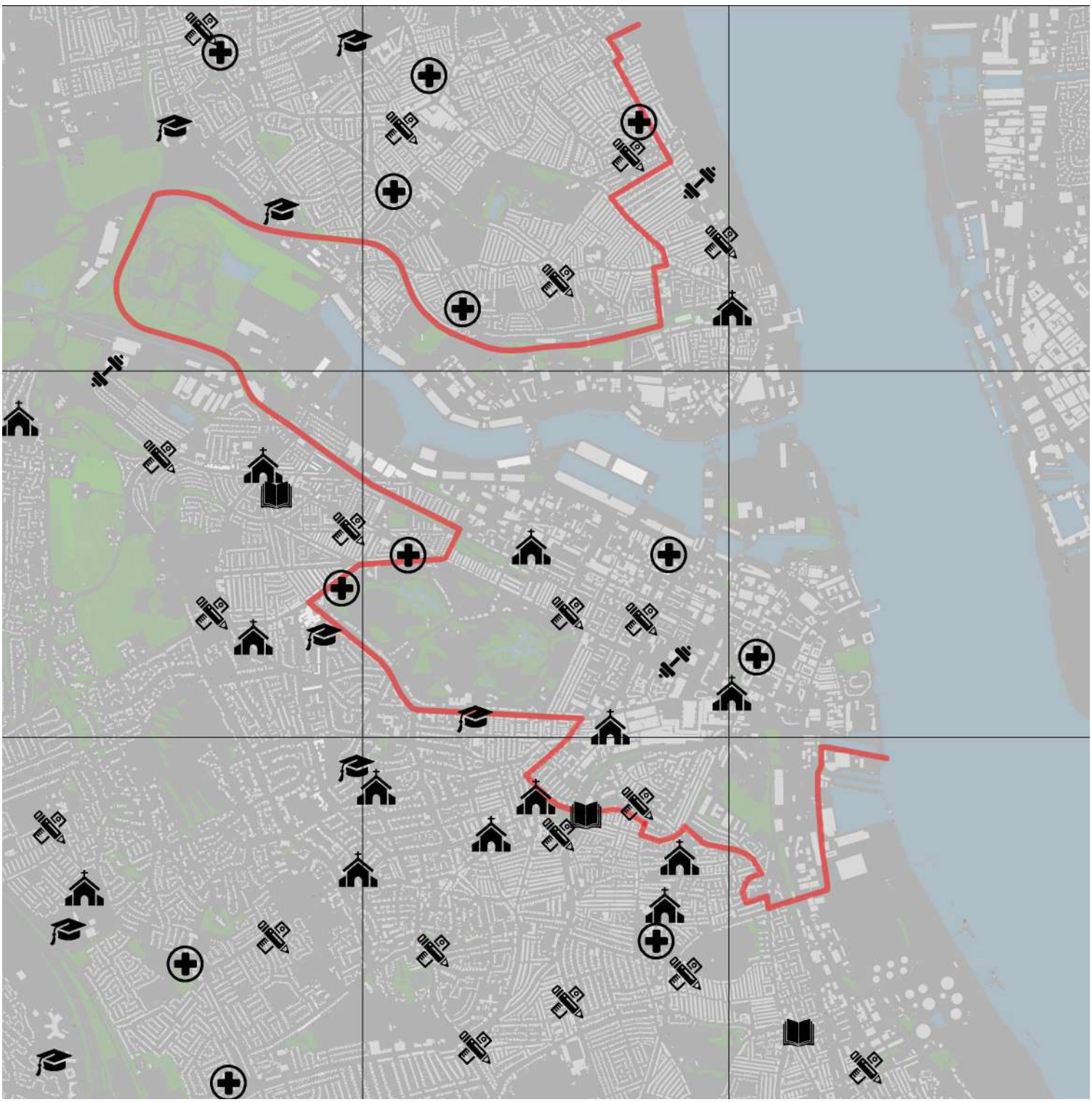
Conservation Areas are designated by local planning authorities to highlight areas with special architectural or historical significance, often featuring listed buildings. These areas are characterized by their unique historical road layouts, building groupings, street furniture, and surfaces, all contributing to their distinct appearance and character. Within these areas, the local council has the authority to regulate activities such as demolition, extensions, and other alterations to preserve their special features.

It's the responsibility of local authorities to protect and manage these assets. They regularly review conservation areas to ensure the preservation of their architectural significance. Legislation and strict planning policies grant the council greater control over development within these areas, stressing the importance of high-quality designs that enhance the area's character.

Wirral boasts 26 conservation areas, including nationally important ones like Port Sunlight and Hamilton Square.


3
4
2
1
1 Birkenhead and Tranmere Ward
2 Claughton Ward
3 Bidston and St. James Ward
4 Seacombe Ward

PRESENT



Available services in the area

Education

The schools fall within the 'good' category according to Ofsted ratings, with several achieving an 'outstanding' rating across different age groups. Additionally, there are numerous outstanding schools within a short distance from all residential areas, including the highly-regarded Wirral Grammar Schools for boys and girls situated just 4 miles away in Bebington.

With such excellent educational choices both locally and nearby, Birkenhead provides abundant opportunities for children to excel throughout their schooling. As a result, it's increasingly seen as an attractive location for families to establish roots and nurture their children's growth.

Medical care

Area has a variety of excellent medical institutions, catering to needs from neonatal care to end-of-life support. In addition to highly regarded doctors' surgeries, there's also a wide selection of both NHS and private dentists available. Birkenhead is also within close proximity to Arrowe Park and Clatterbridge hospitals.

All local facilities fall under the NHS Wirral Clinical Commissioning Group (CCG), which operates with a mission to "commission high-quality services which enable the people of Wirral to improve their own health and well-being."

Kindergardens

High schools/ Higher education amenities

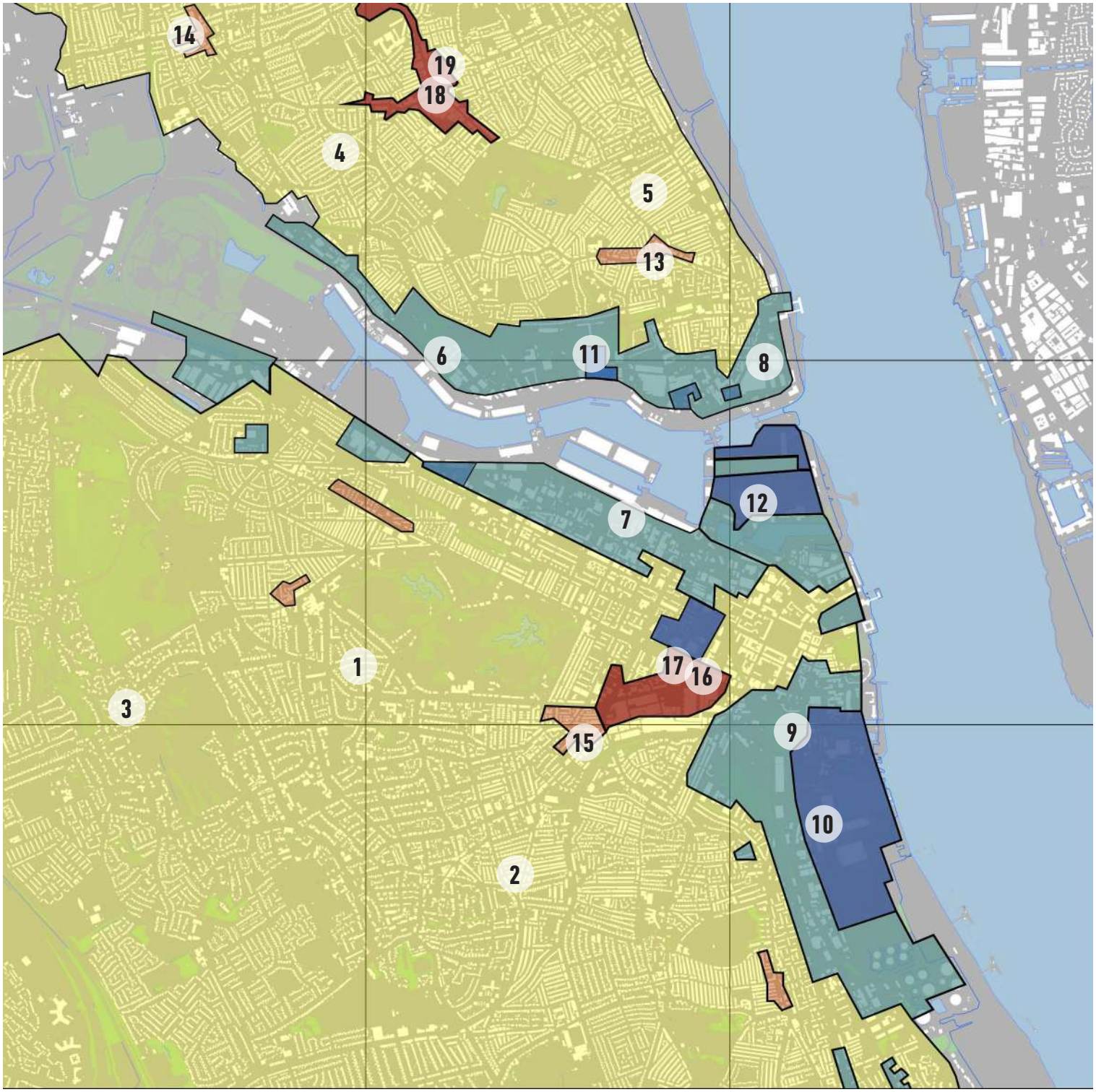
Libraries

Medical centres

Places of worship

Leisure centres

Area Zoning



Residential Areas

St. David Road 60

S Hill Road 27

Whinmoor Cl 2

Willoughby Road 3

Littledale Road 50

Industrial Areas

Dock Road 13

Corporation Road 69

East Street 2

Wirral Circular Trail 1

Employment Areas

Commerce park, Campbeltown Rd, Tranmere

Sovereign Way 8

Morpeth Wharf 11

Suburban Centre Areas

Mainwaring Road 3

Wallasey Willage 96

Tetbury Street 63

Town Centre Areas

Conway St. 132

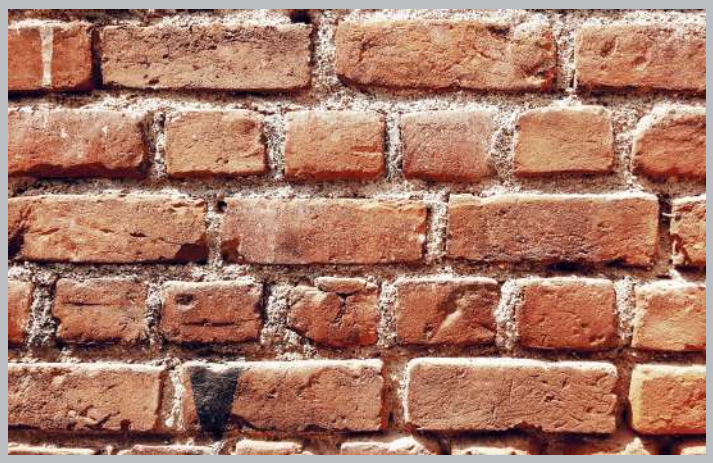
Conway St. 122

Wallasey Road 6

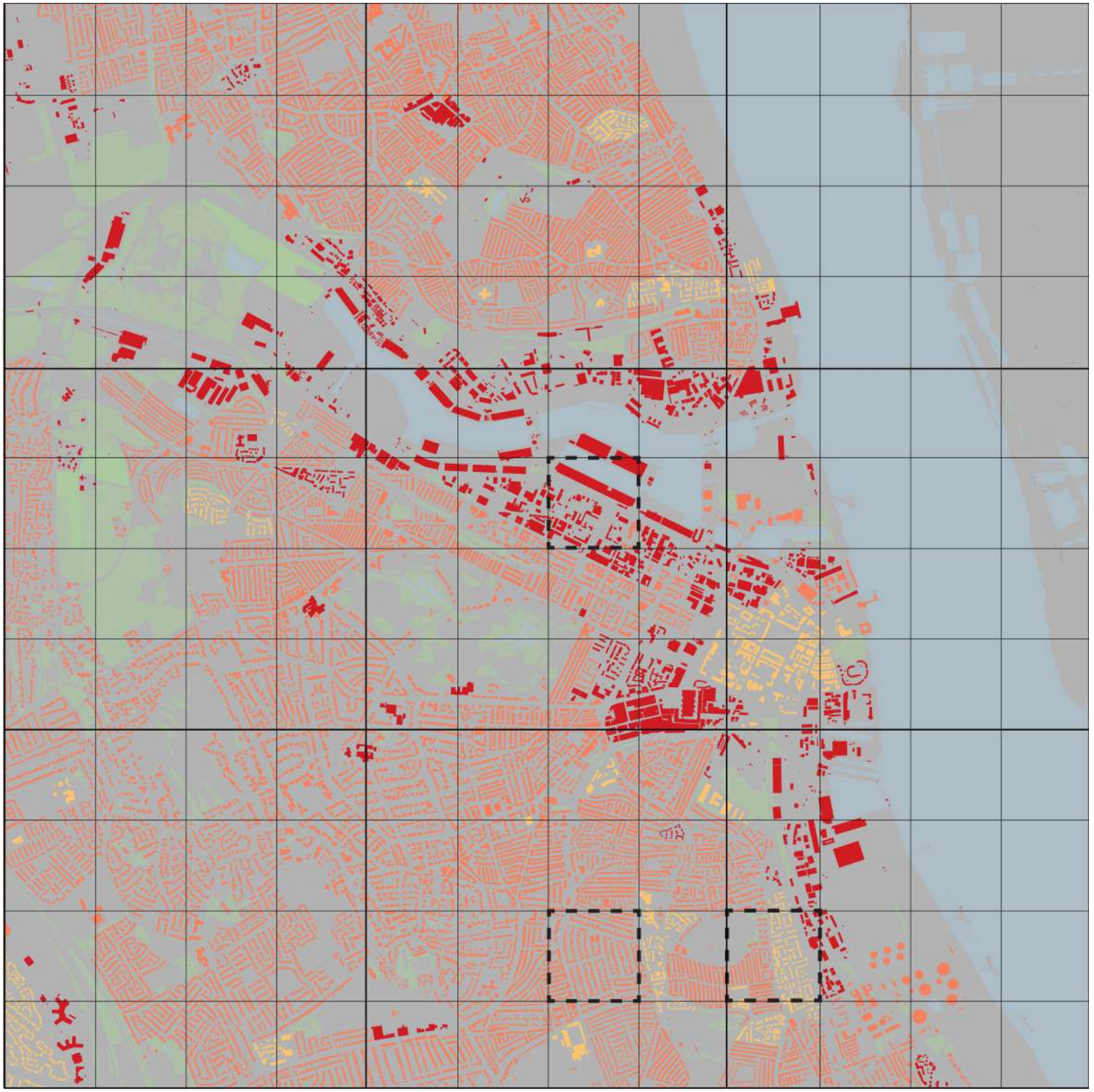
West Street 12

Materiality

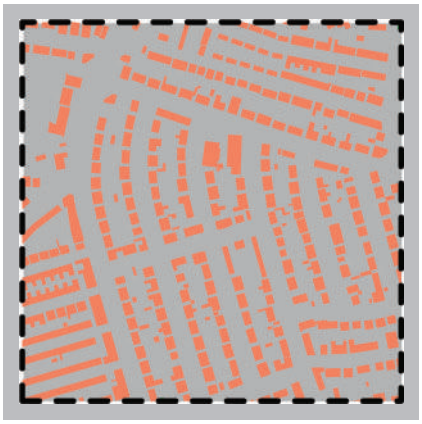
Facades

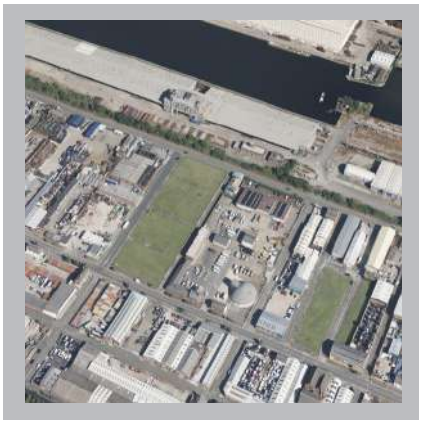


Roofs



Building patterns





Consistent pattern

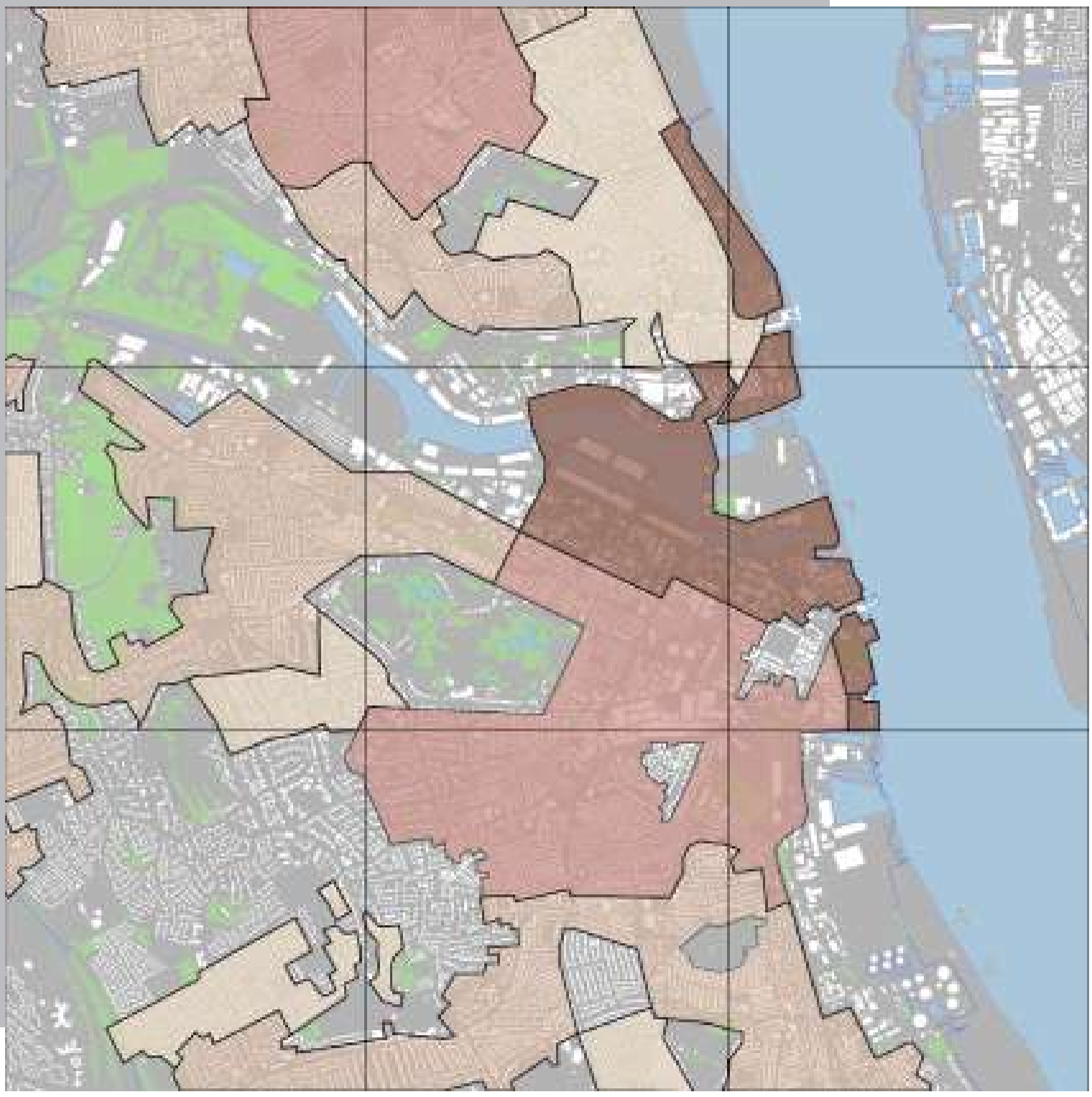
Consistent building pattern involves ensuring uniformity in the layout of buildings within a development area. This approach creates a visually cohesive urban landscape. Consistent building patterns also have practical benefits, such as improving wayfinding and supporting sustainability efforts. Overall, establishing a consistent building pattern requires careful planning, coordination, and consideration of aesthetic and functional aspects.

Interupted pattern

Interrupted building pattern deliberately introduces variations in architectural elements, materials, layout, or design within a development or urban area. Unlike a consistent pattern aiming for cohesion, interruptions create diversity and contrast of visual sight. This approach allows for diverse architectural styles, materials, colors, layouts, and design features.

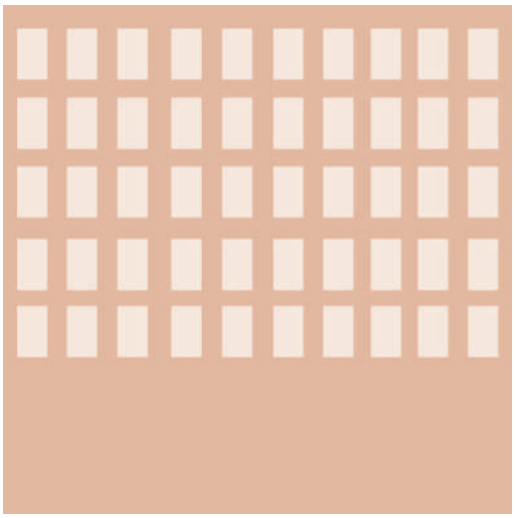
Inconsistent pattern

Inconsistent building patterns refer to a lack of uniformity or cohesion in the design, materials, layout, or architectural elements within a development or urban area. They result from unplanned development, lack of regulations, historical development. This inconsistency detracts from aesthetic quality, functionality, and sense of place.

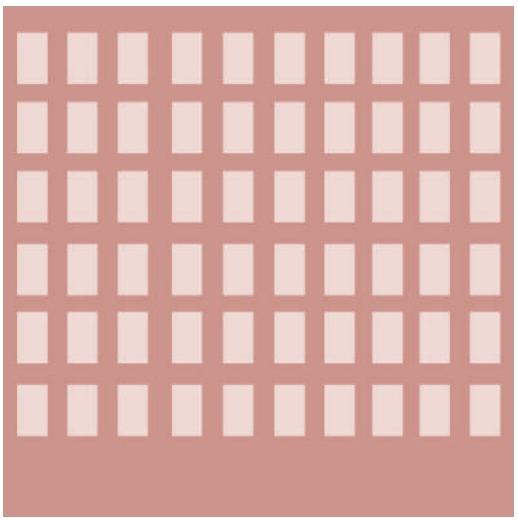


Building density

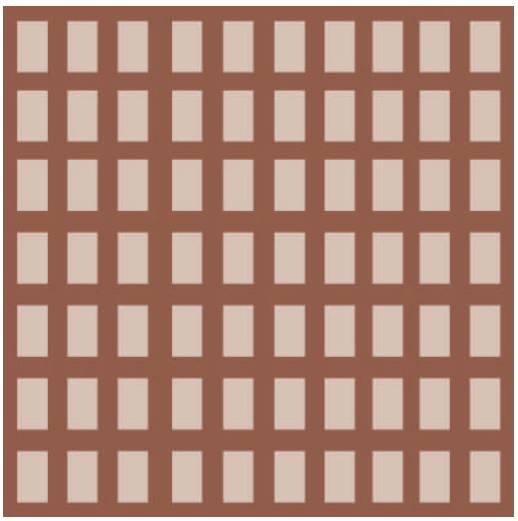
Suburban Area Density Zone
Minimum 40 dwellings per hectare



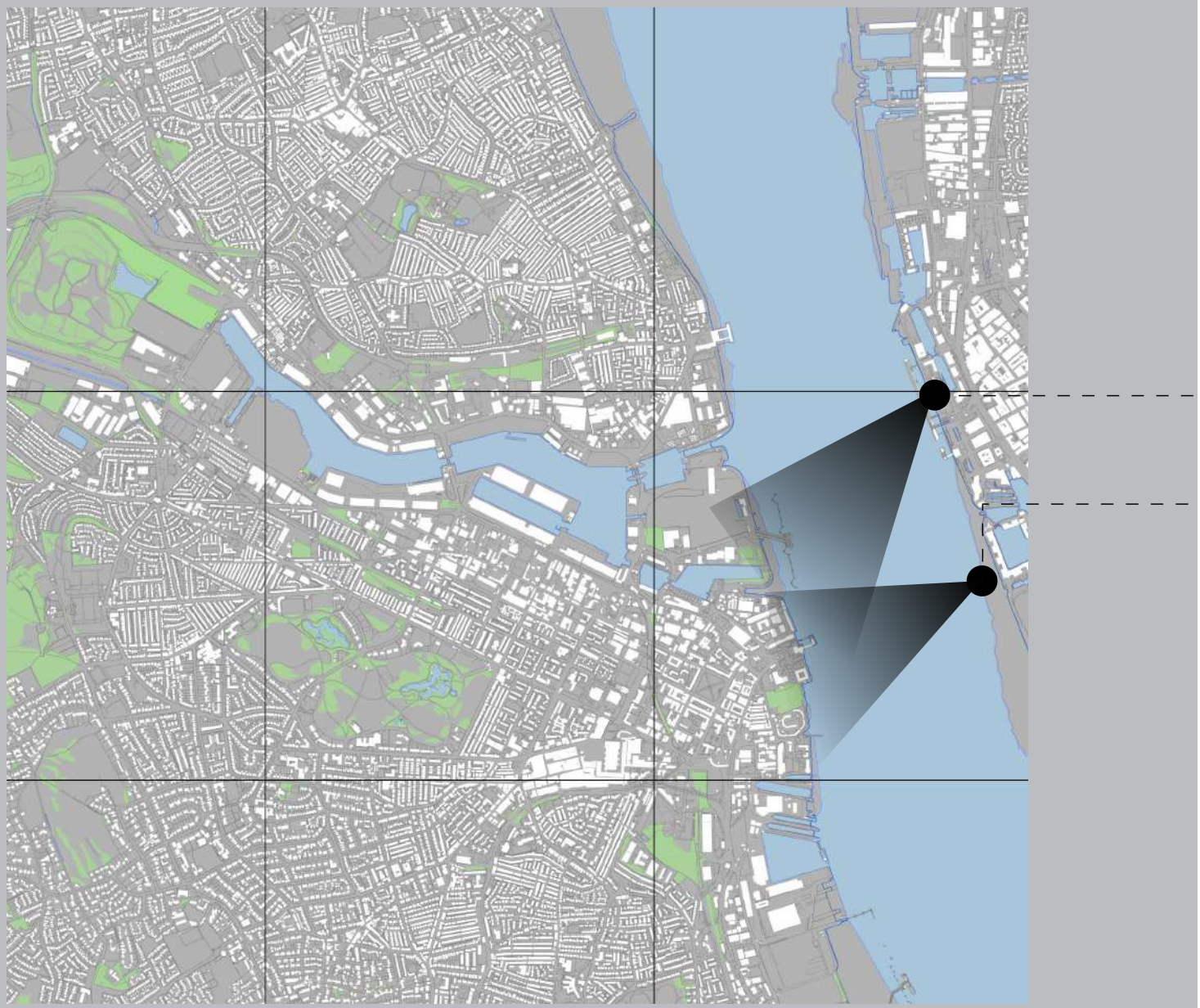
Transit area Density Zones
Minimum 50 dwellings per hectare



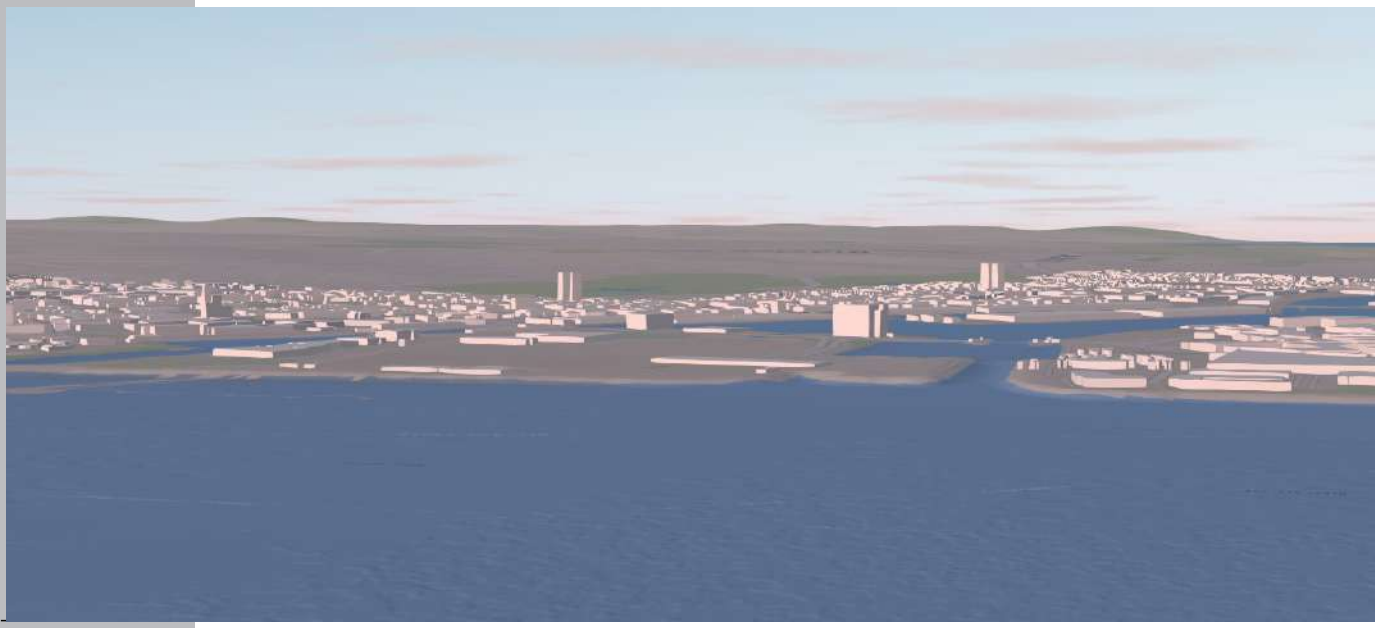
Urban Core and Town Centres Density Zones
Minimum 60 dwellings per hectare

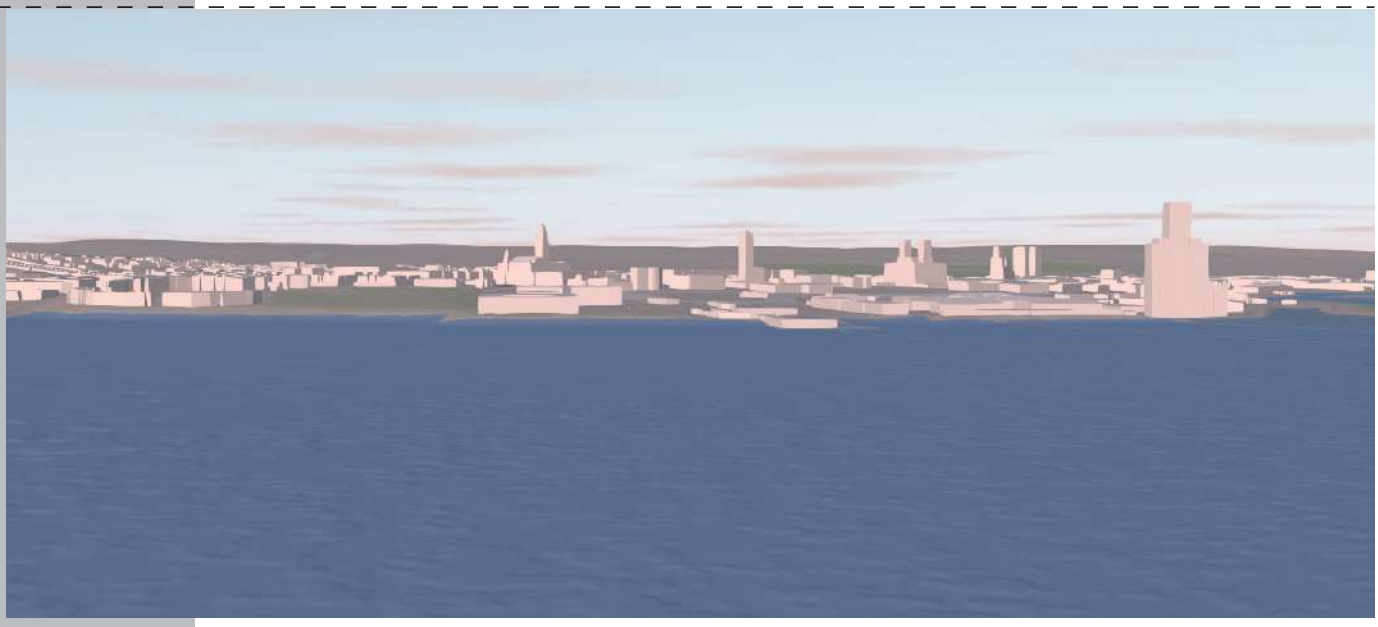


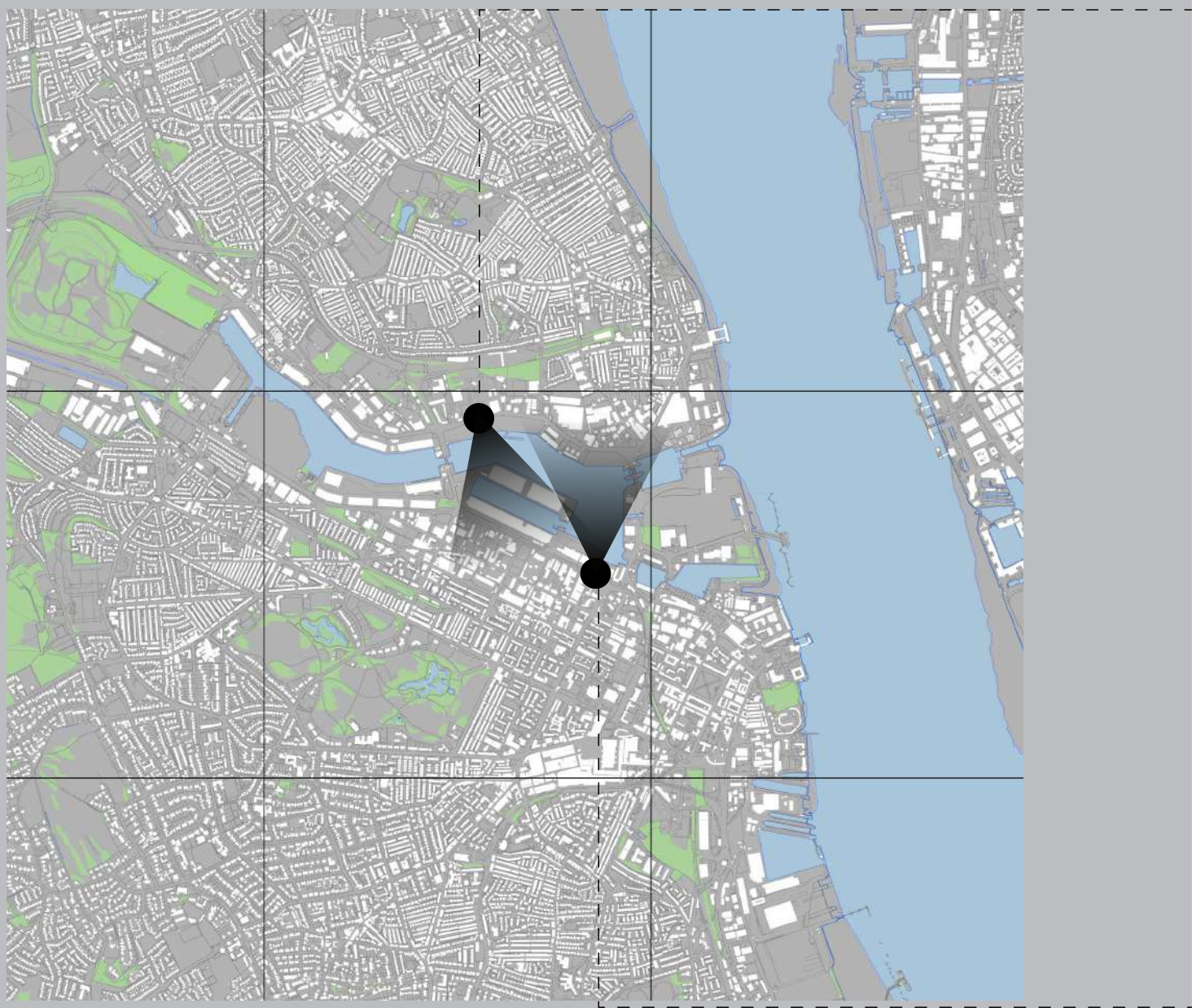
Waterfront Density Zones
Minimum 70 dwellings per hectare



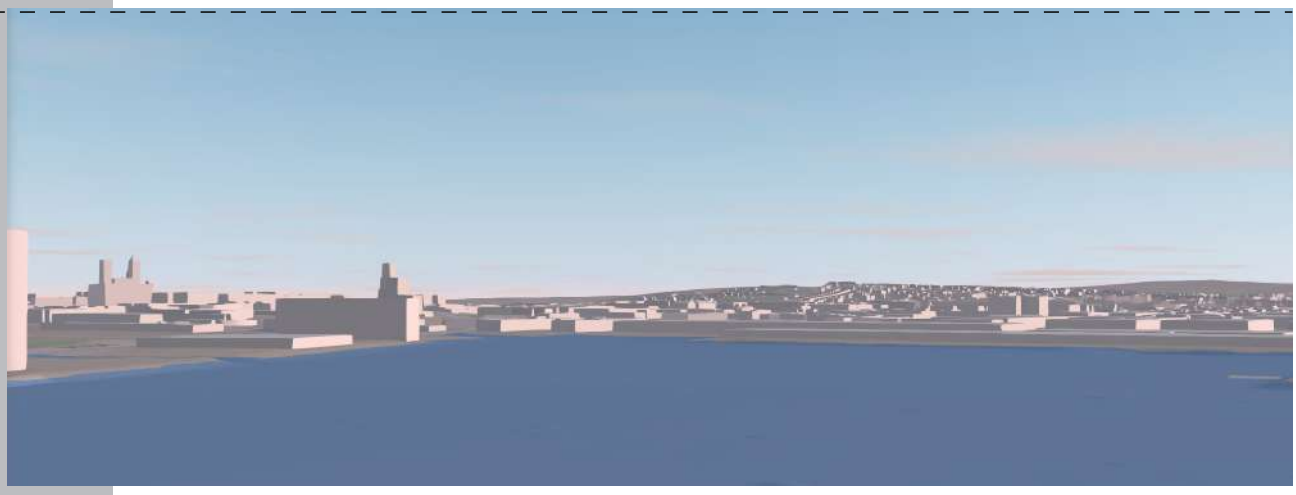
Skyline from Liverpool

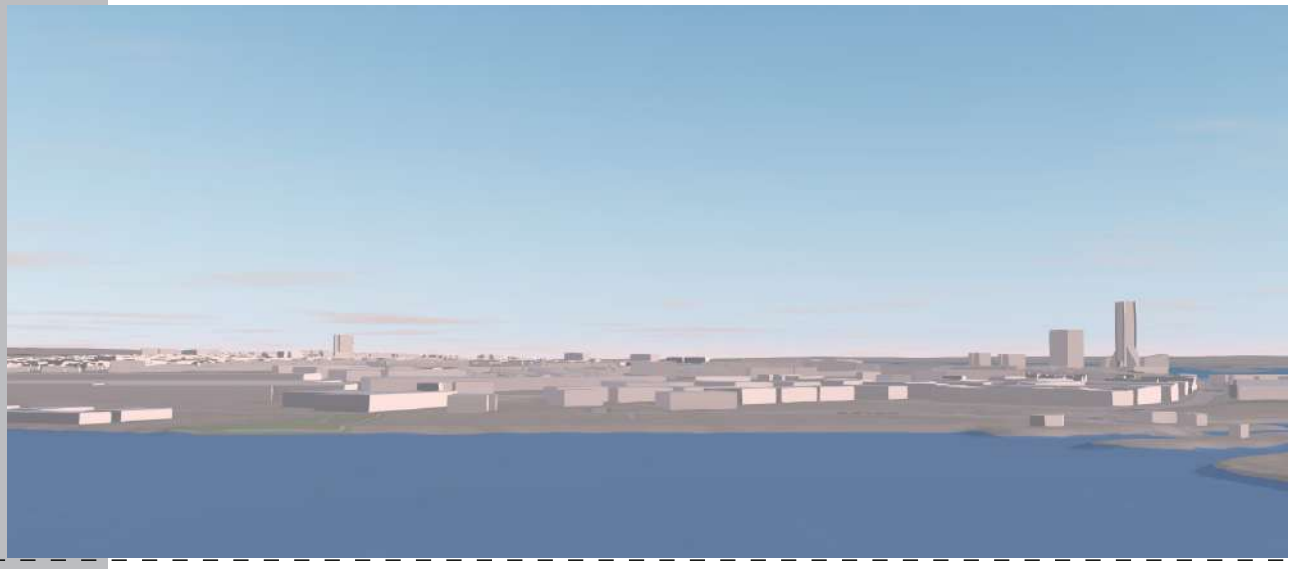




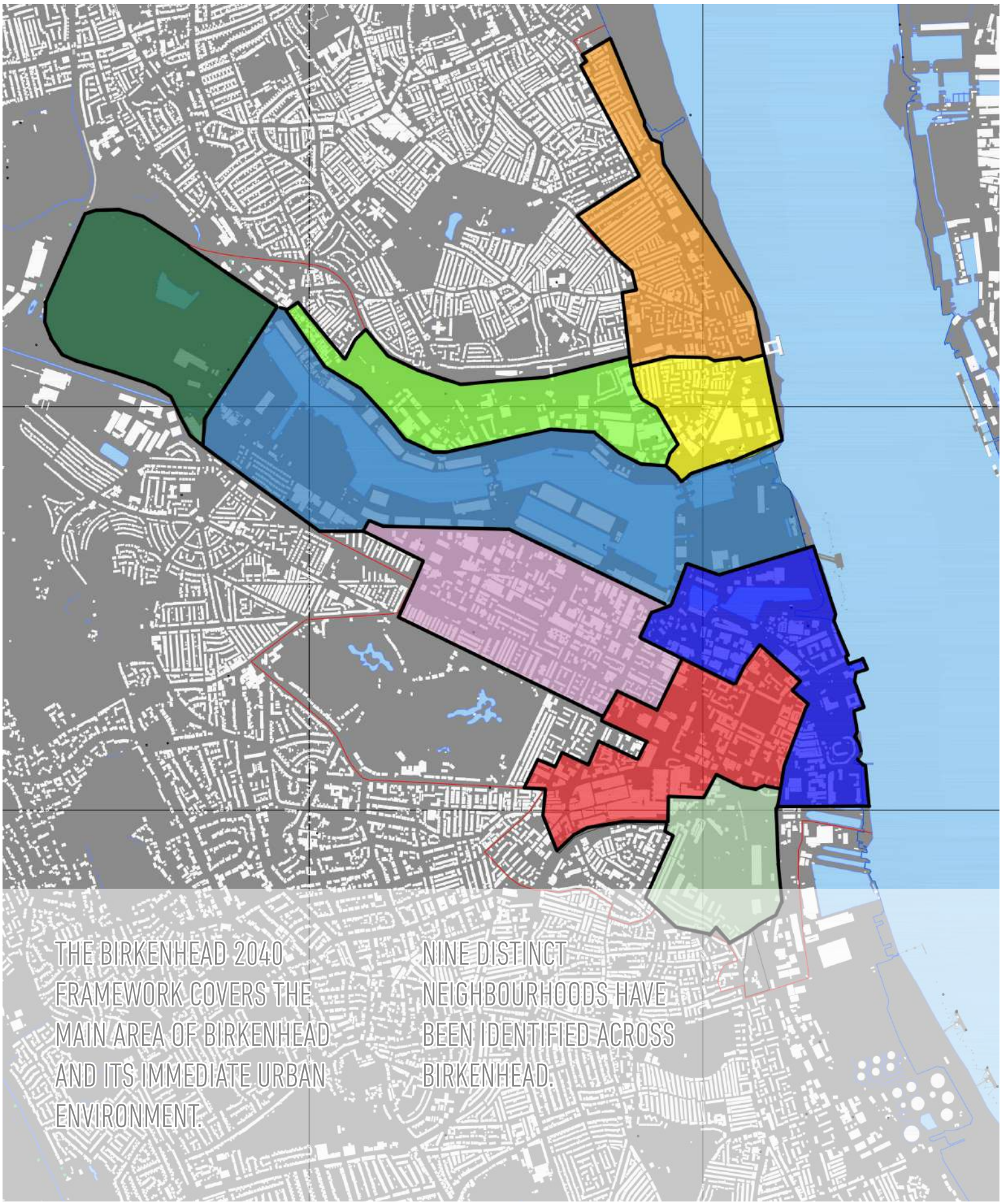


Skyline from channel sides





FUTURE



THE BIRKENHEAD 2040 FRAMEWORK COVERS THE MAIN AREA OF BIRKENHEAD AND ITS IMMEDIATE URBAN ENVIRONMENT.

NINE DISTINCT NEIGHBOURHOODS HAVE BEEN IDENTIFIED ACROSS BIRKENHEAD.

SEACOMBE RIVERSIDE CORRIDOR

New housing and improved environment,
building on the opening of Eureka! Mersey in 2022,
and a re-purposed Town Hall quarter

NORTHSIDE

Increasing the availability of modern,
purpose-built business and employment accommodation

WIRRAL WATERS + PORTSIDE

The £4.5 billion transformation of Birkenhead's
docks through mixed-use development alongside
continued growth of the operational port

SCOTTS QUAY

Opportunity for new residential
development and an improved environment through
high quality employment uses and more people-friendly streets

BIRKENHEAD'S WATERFRONT

Our hidden gem - opening up the Mersey waterfront as a major destination
with new housing, leisure, arts and culture development,
making the most of the unrivalled views of the Liverpool skyline

HAMILTON PARK

Creation of more family-friendly housing
through a changed mix of business and residential uses, making the most of the location between Birkenhead Park and the new Wirral Waters development at Vittoria Studios

CENTRAL BIRKENHEAD

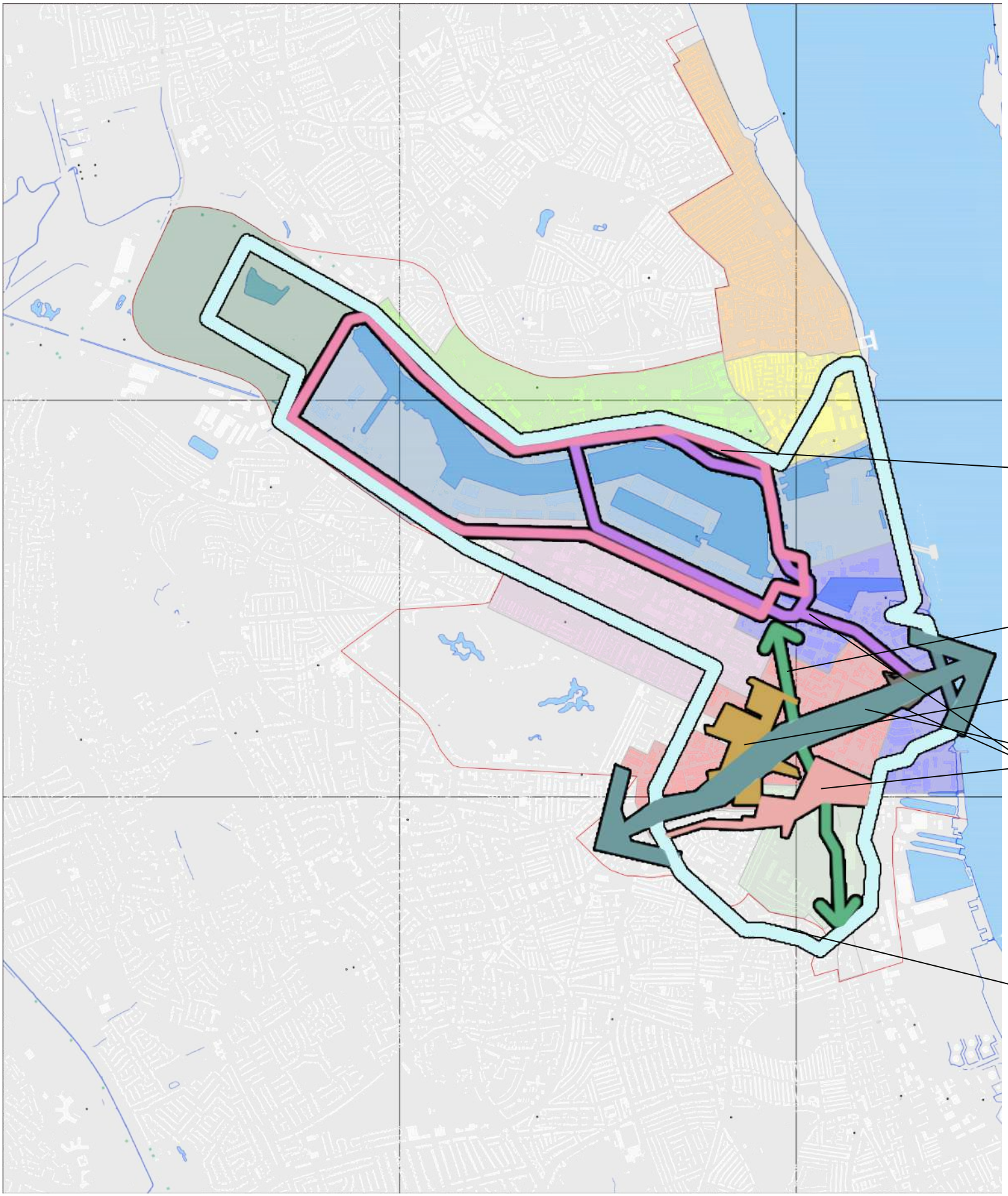
A revitalised and vibrant town centre,
with more cultural and creative businesses
and a purpose-built indoor market, bringing life to the town

HIND STREET URBAN VILLAGE

Creation of an exciting new low-carbon urban village
of up to 1,000 new homes on this brownfield site

BIDSTON MOSS + DOCK

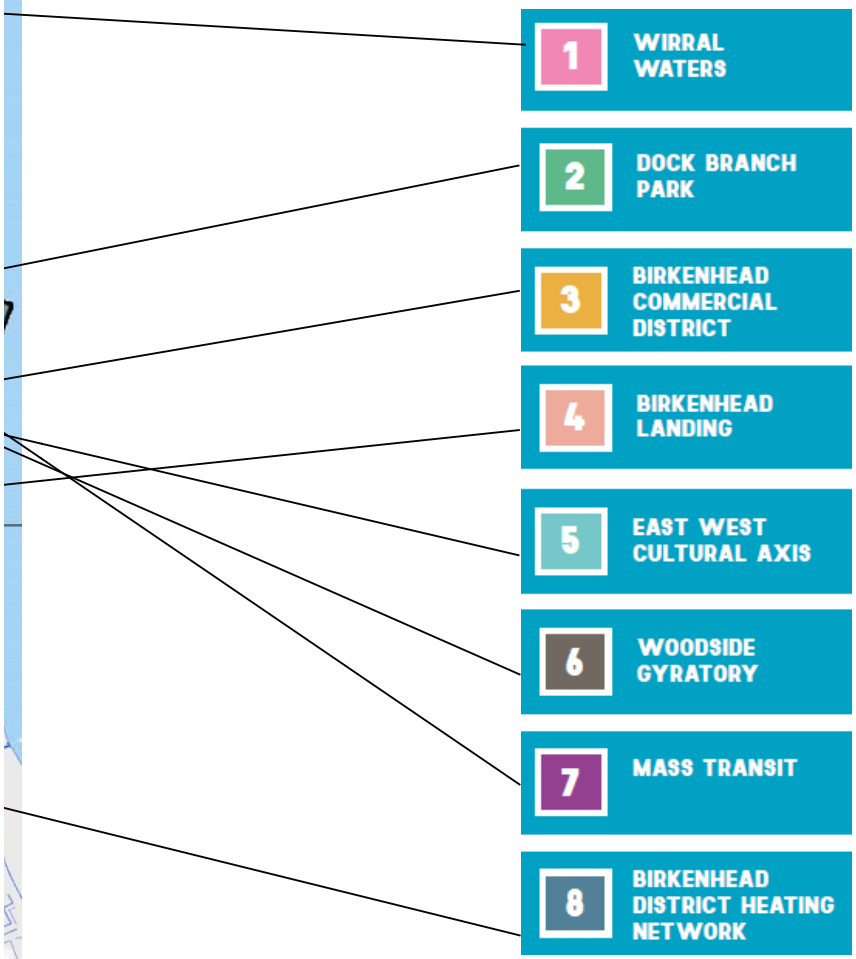
Increasing the value and use of the Moss as one of
Birkenhead's key green spaces and leisure opportunities



BIRKENHEAD'S CATALYST PROJECTS

The Framework addresses this issue head on – through the identification of a number of catalyst projects, all of which are progressing to address structural place or market issues, and ultimately create the right conditions for investment and value growth.

These catalyst projects are strategically important for Wirral – underpinning the reconnection, reimagination, rediscovery and repopulation of Birkenhead. Other projects can be catalytic in their own right, but the Framework has identified those most apparent at the current time.



WIRRAL WATERS

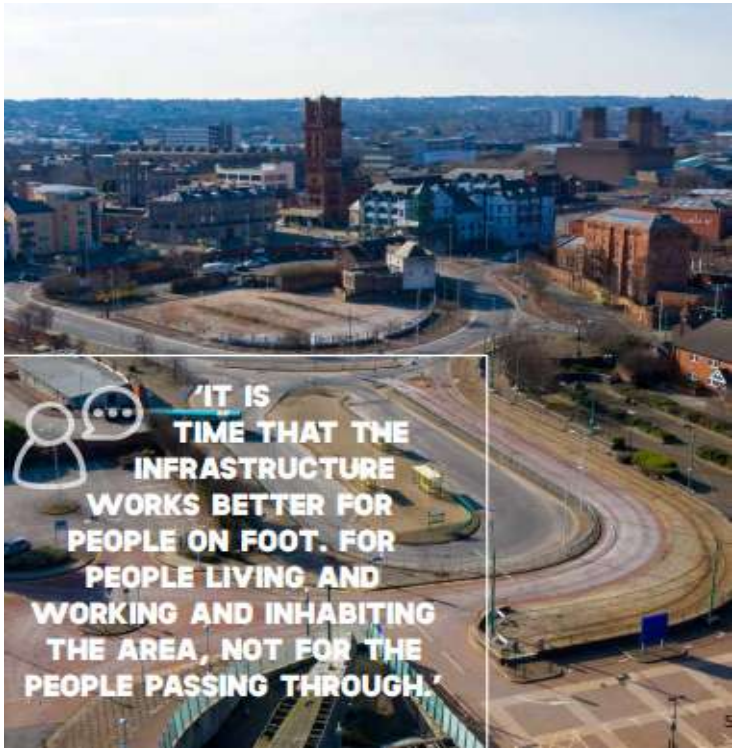
DOCK BRANCH PARK

BIRKENHEAD COMMERCIAL DISTRICT

BIRKENHEAD LANDING

EAST WEST CULTURAL AXIS

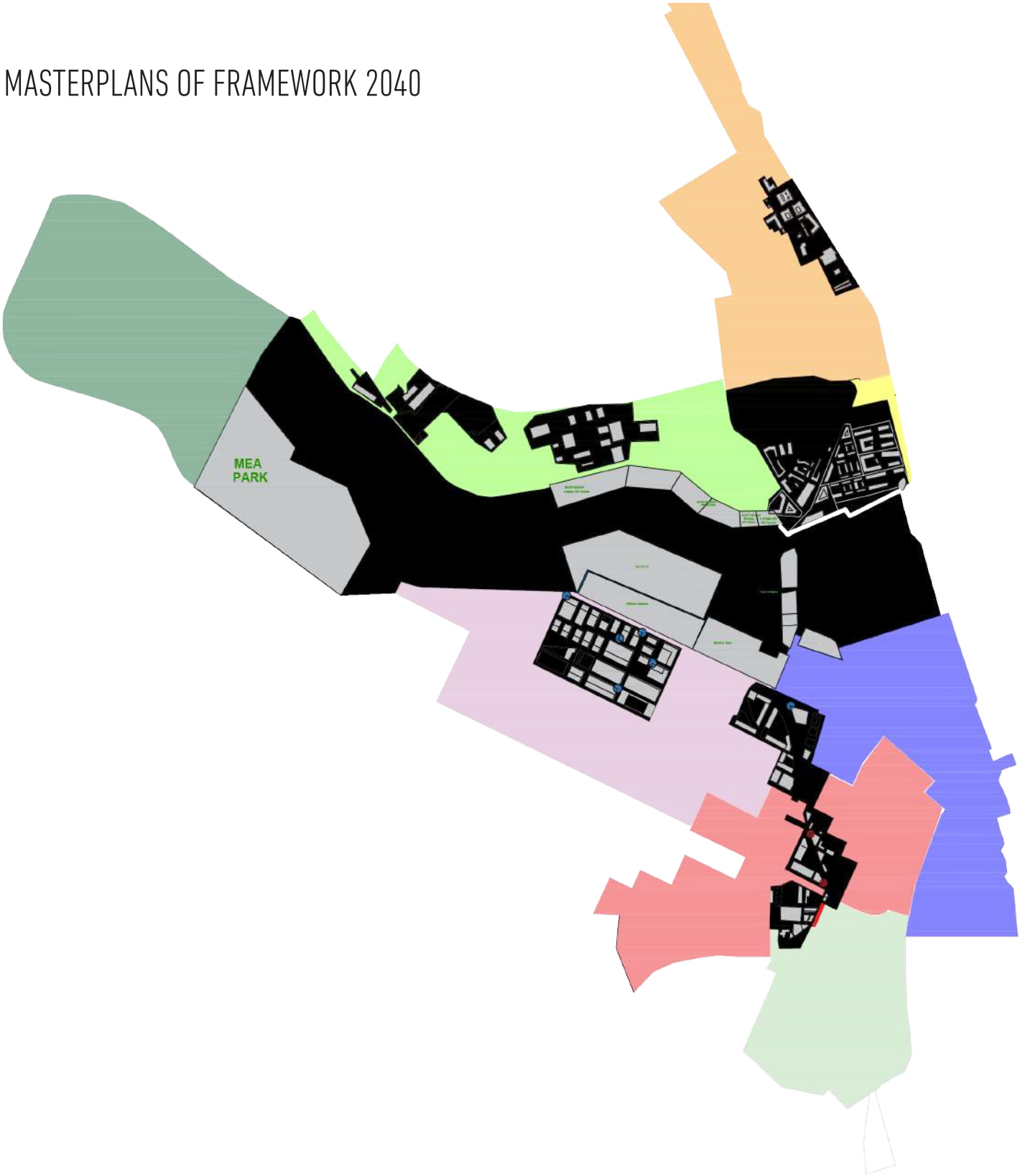
WOODSIDE GYRATORY

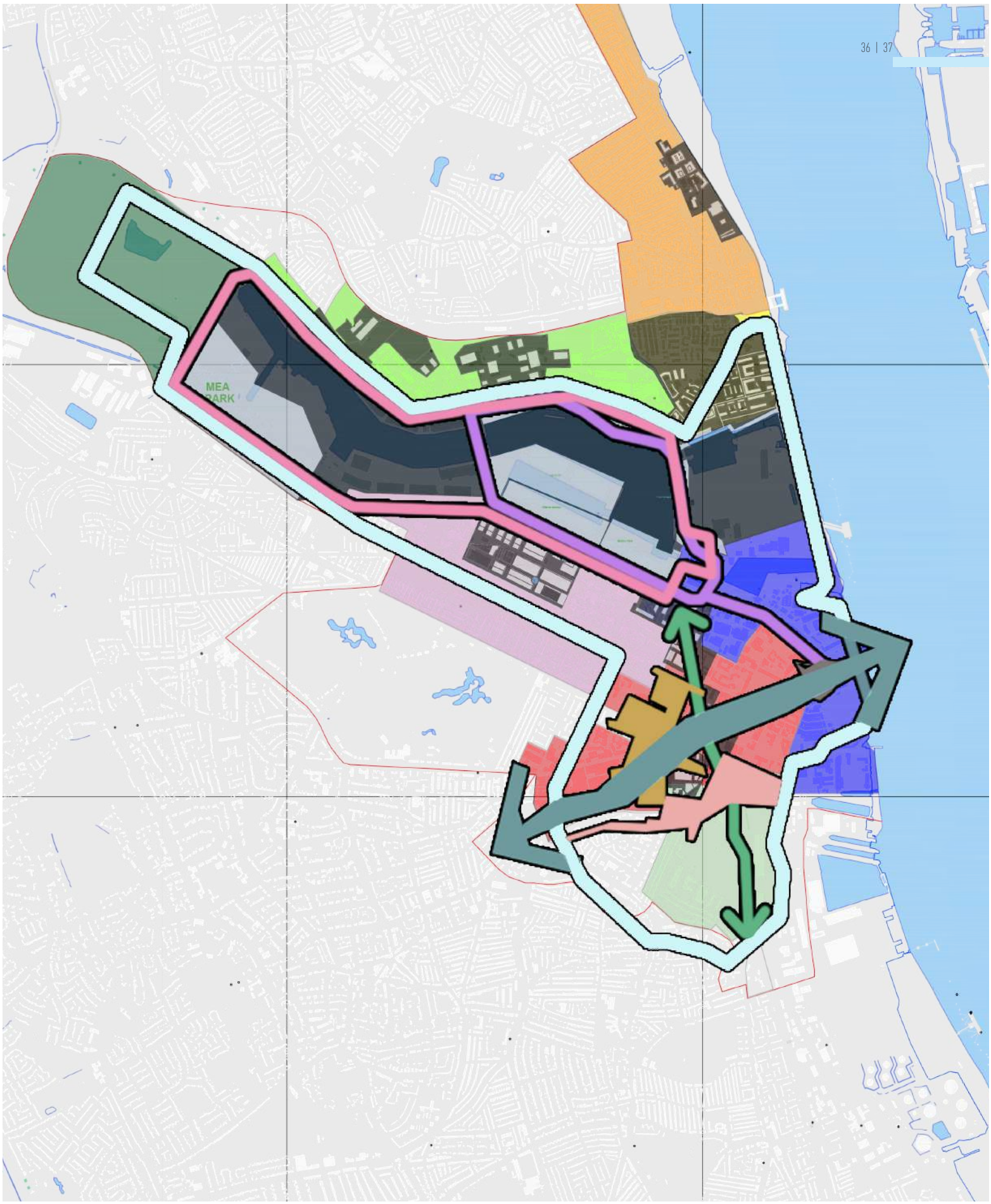


MASS TRANSIT

BIRKENHEAD DISTRICT HEATING NETWORK

MASTERPLANS OF FRAMEWORK 2040




MEA
PARK

mixed use

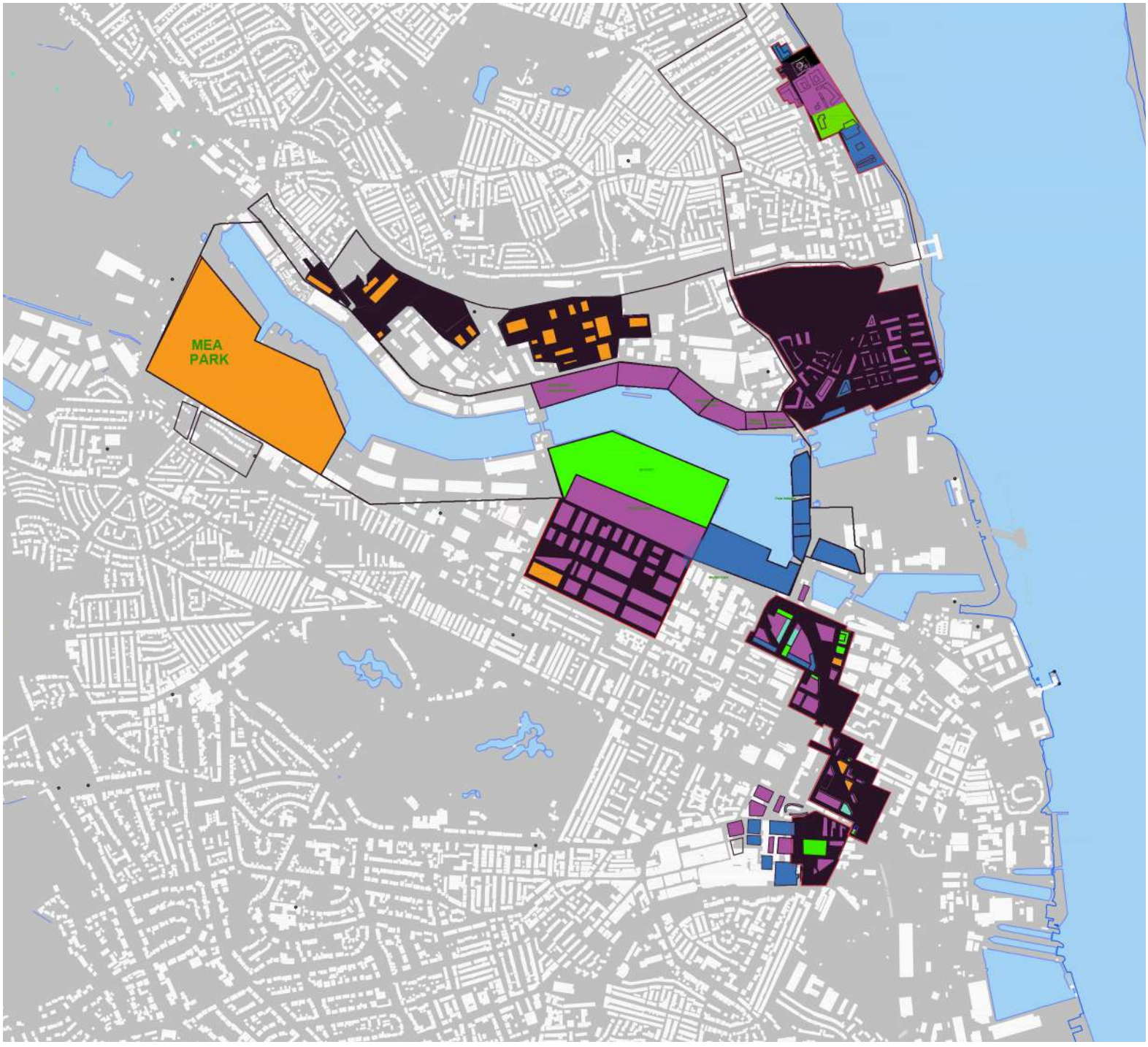
mixed residential

Industrial A waterside manufacturing, logis

4 Commercial

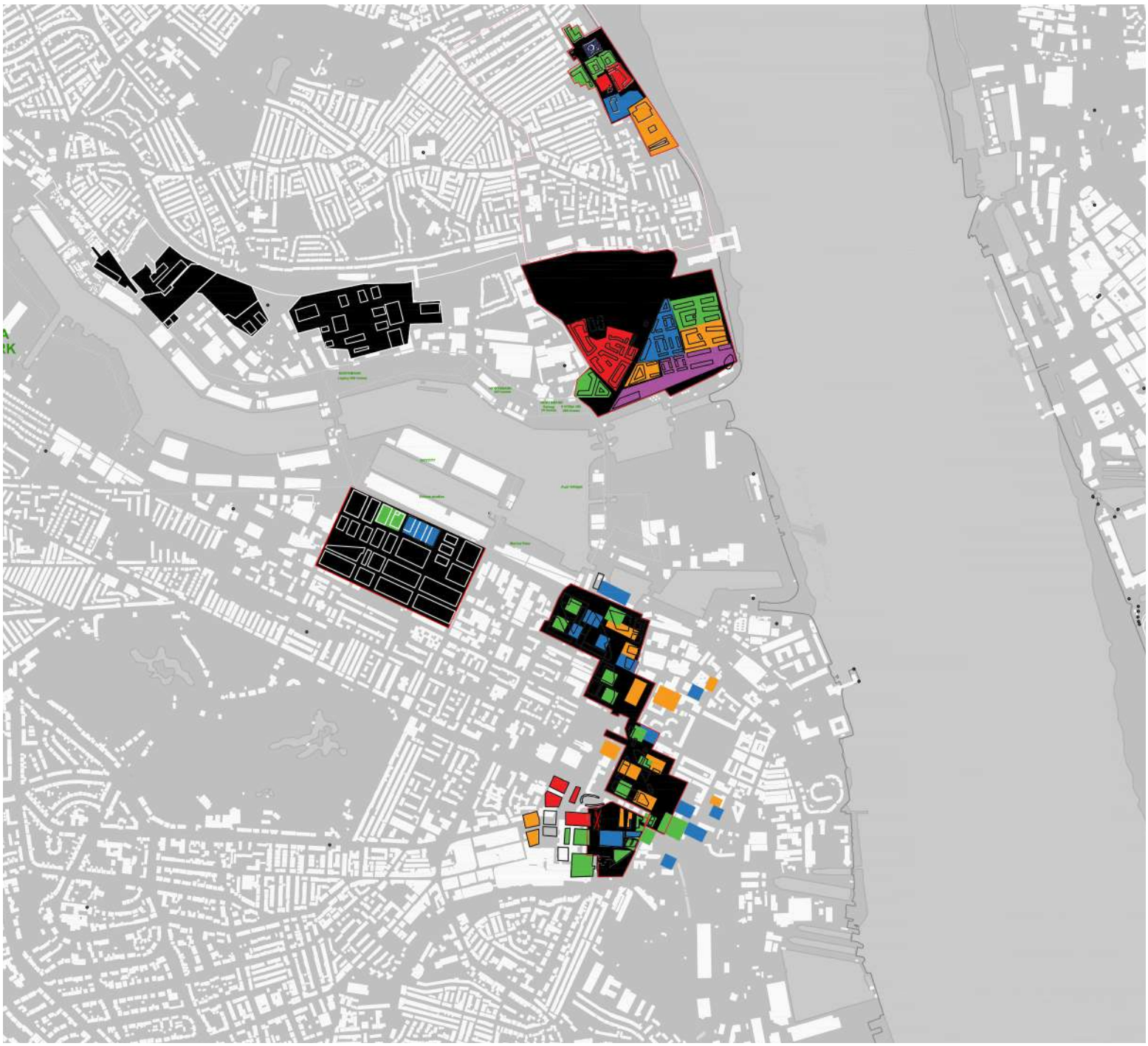
Educational

Flexible

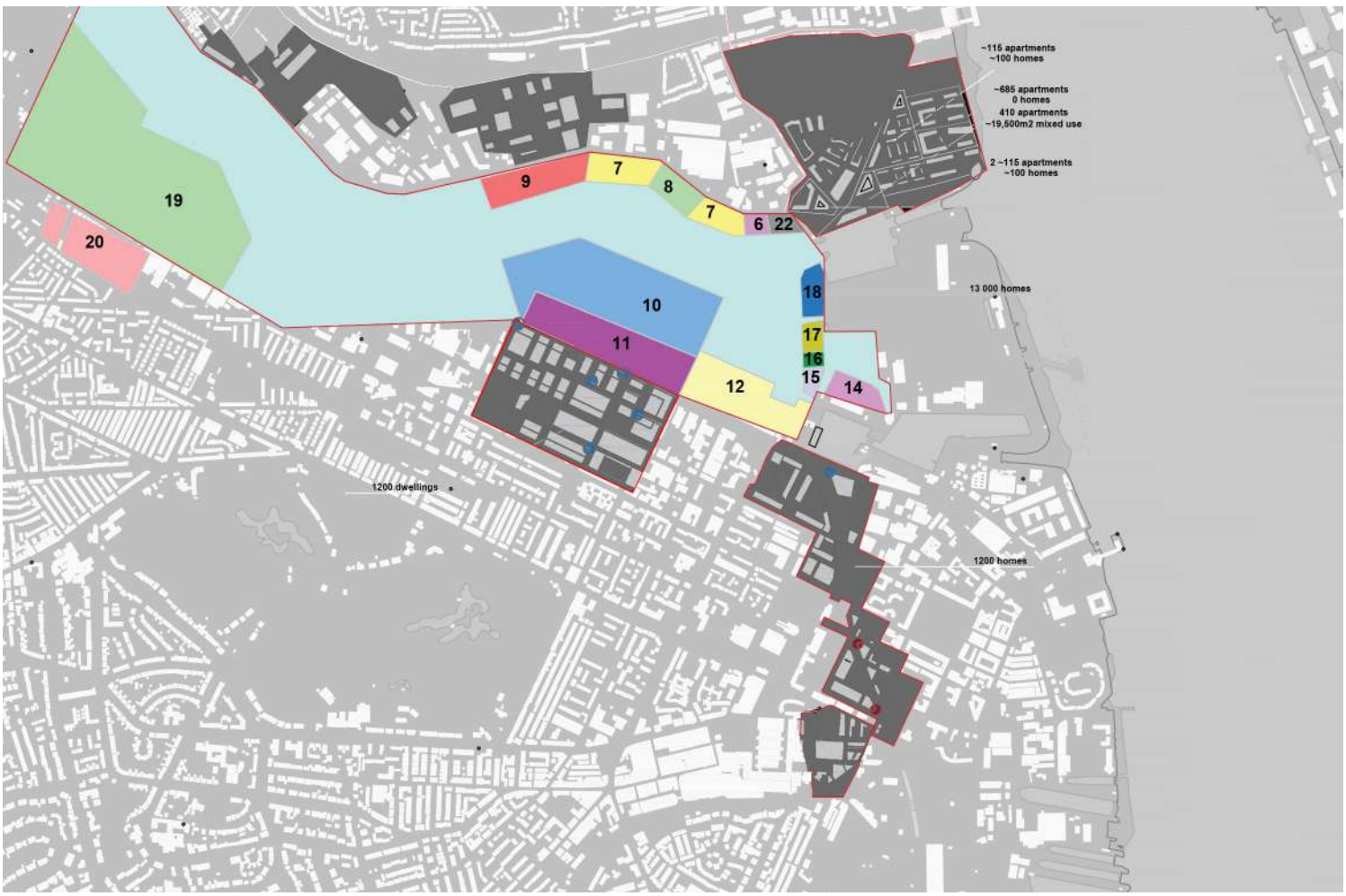


1-2 soreys
2-3 soreys
3-5 soreys
3-4 soreys
4-5 soreys
5-6 soreys
6-7 soreys
6-8 soreys
-13 soreys
-16 soreys
-26 soreys

1 Phase
2 Phase
3 Phase
4 Phase
5 Phase



WIRRAL WATERS



Millers Quay
- Residential

UNDER CONSTRUCTION

Maritime Knowledge
- Offices
- Education

East Float Quay
- Residential

Wirral Met College
- Education

Completed as the first project of Wirral waters

Redbridge Quay
- Residential

Completed

Hythe
- Offices

Completed December 2021

KINGSGATE

Completed in November 2015

Egerton Village
- Offices
- Retail spaces

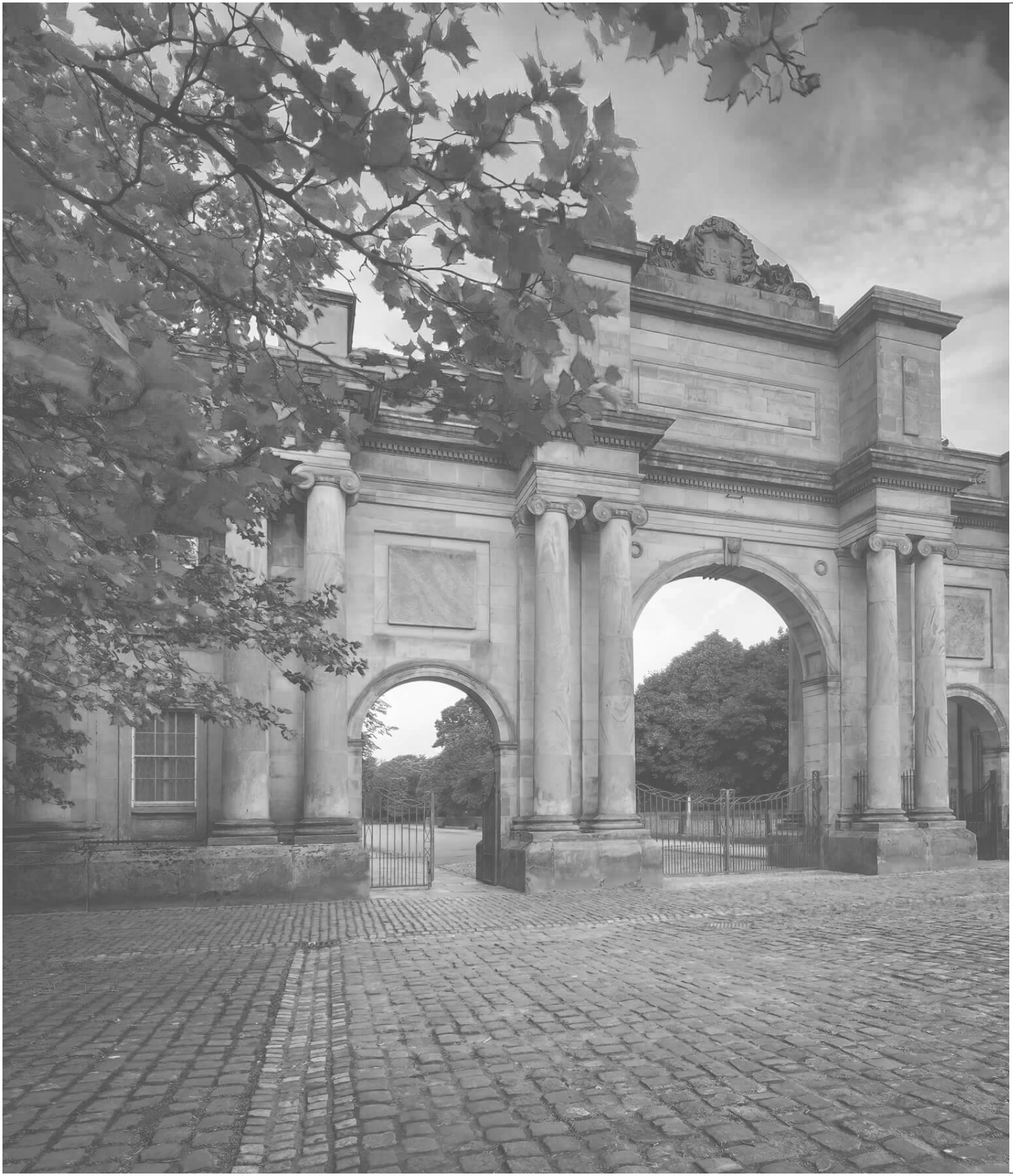
Sky City
- Cultural quarter
- Commercial qua
- Leisure time qua

Marina view
- Residential quarter
- Commercial quarter

Vittoria Studios
- Creative industries
- Galleries
- Working spaces

MEA park
- Manifacturing
- Logistics
- Distribution
- Industrial hub

R4



Social structures
Ksenia x Camila

Birkenhead
Past & present
Recent dinamics

Reviewed categories:
- Elderly
- Disabled
- Health
- Employment
- Religion
- Unmarries
- Family
- Home ownership

Birkenhead population has gone through a few changes over the recent years.

The share of residents aged between 65 and 74 years increased by 2.1 percentage points between 2011 and 2021

The percentage of people who were identified as being disabled and limited a lot in Wirral decreased by 1.2 percentage points

The percentage of people in very good health in Wirral increased by 1.4 percentage points

The percentage of people aged 16 years and over who were unemployed (excluding full-time students) in Wirral decreased by 2.1 percentage points

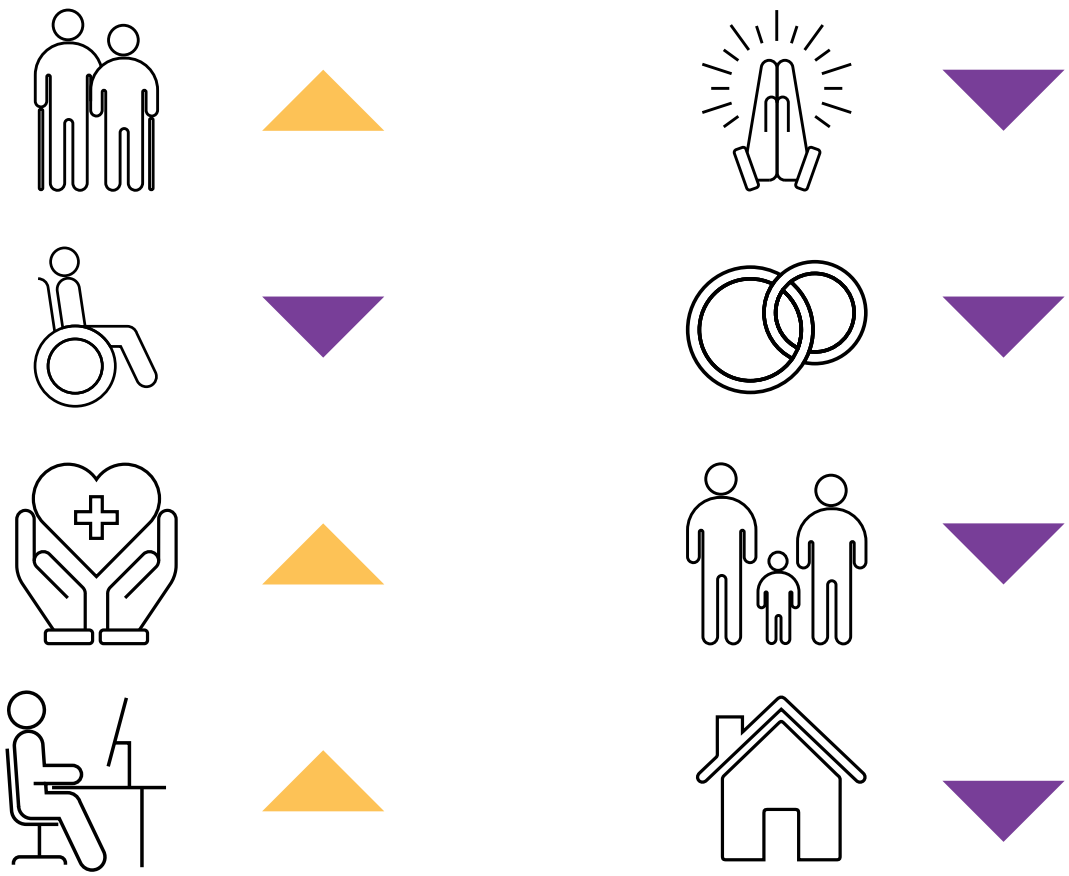
The percentage of Wirral residents reported having "No religion", up from 21.3% to 37.3%

The percentage of adults who had never married or registered a civil partnership in Wirral increased by 3.5 percentage points

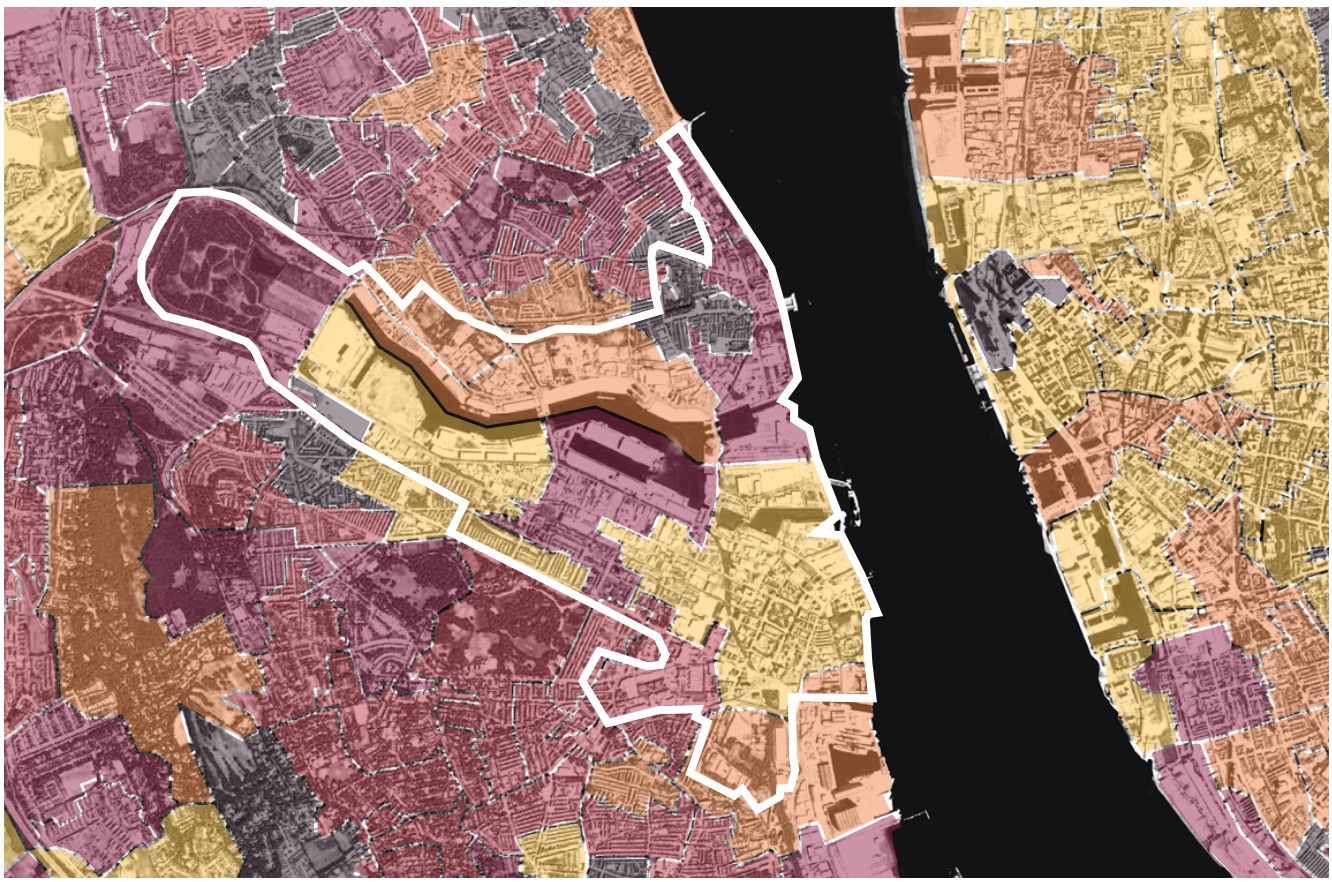
The percentage of households including a couple without children in Wirral decreased by 0.4 percentage points

The rate of home ownership in Wirral decreased by 2.5 percentage points

*According to the data provided by Census 2021



Demographics
Total population

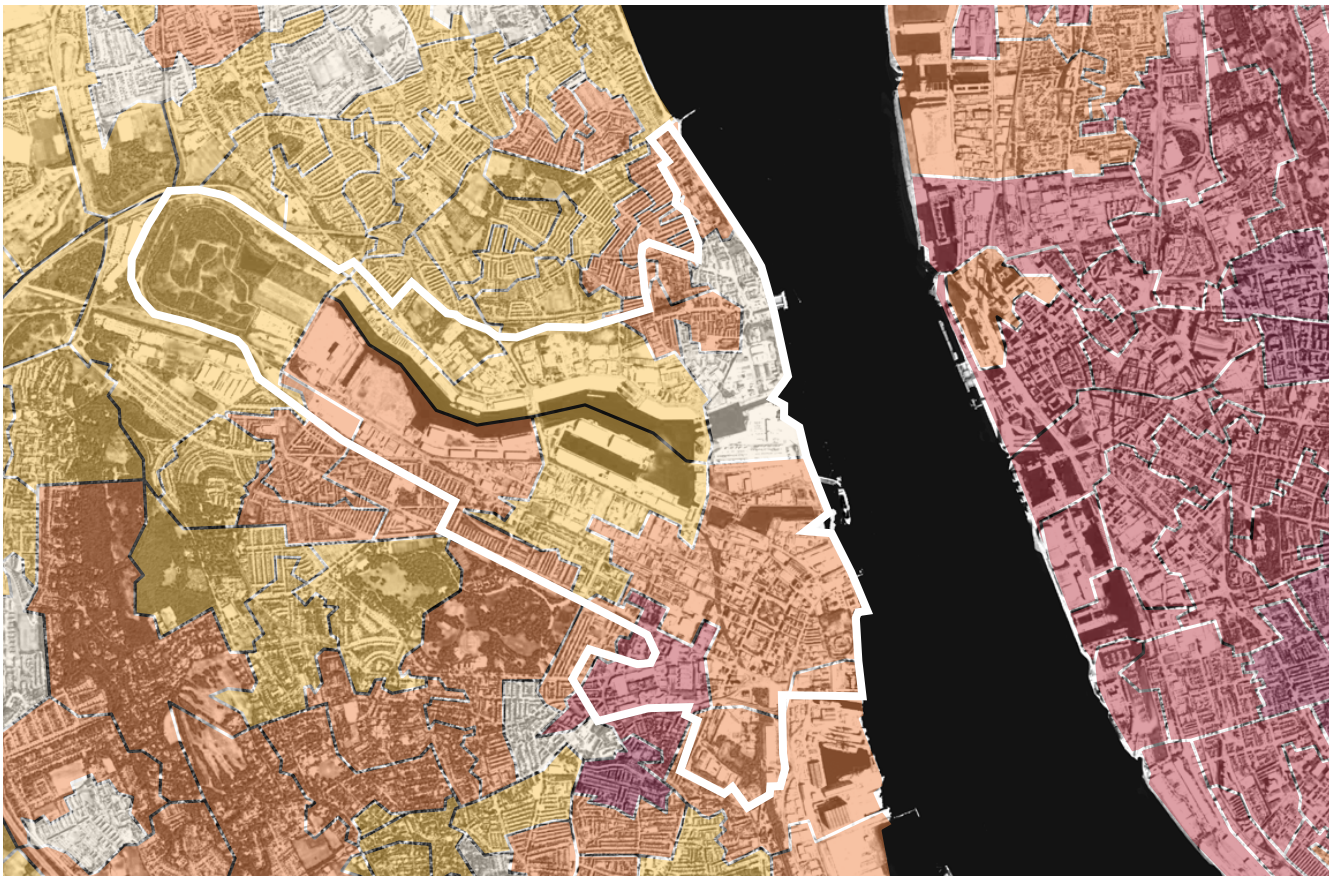


Most populated

Least populated

*According to the data provided by Wirral Intelligence Service

Demographics
Non white ethnic groups

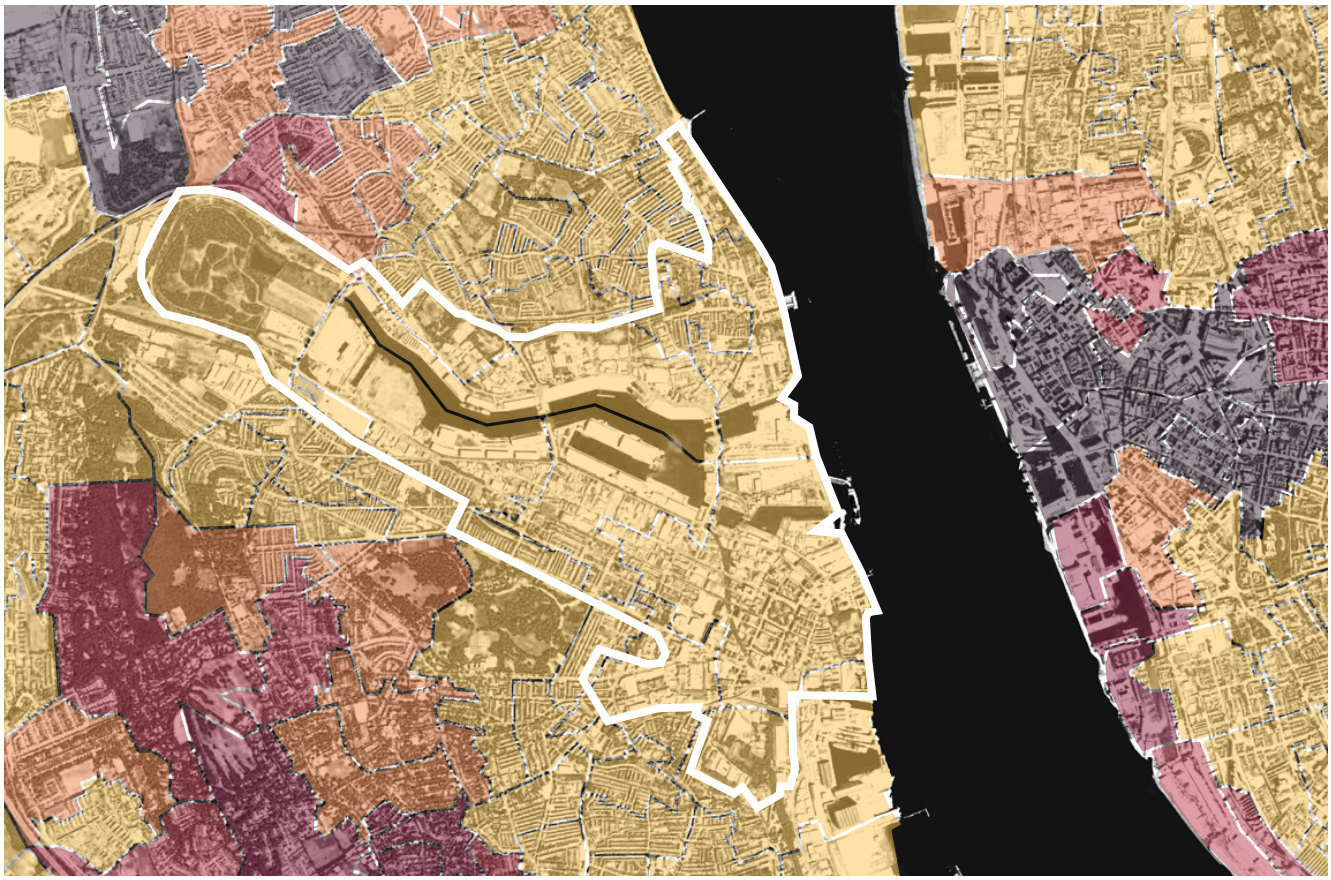


Mostly white ethnic group

Mostly non-white ethnic group

*According to the data provided by Wirral Intelligence Service

Demographics
IoD 2019 Income score rate

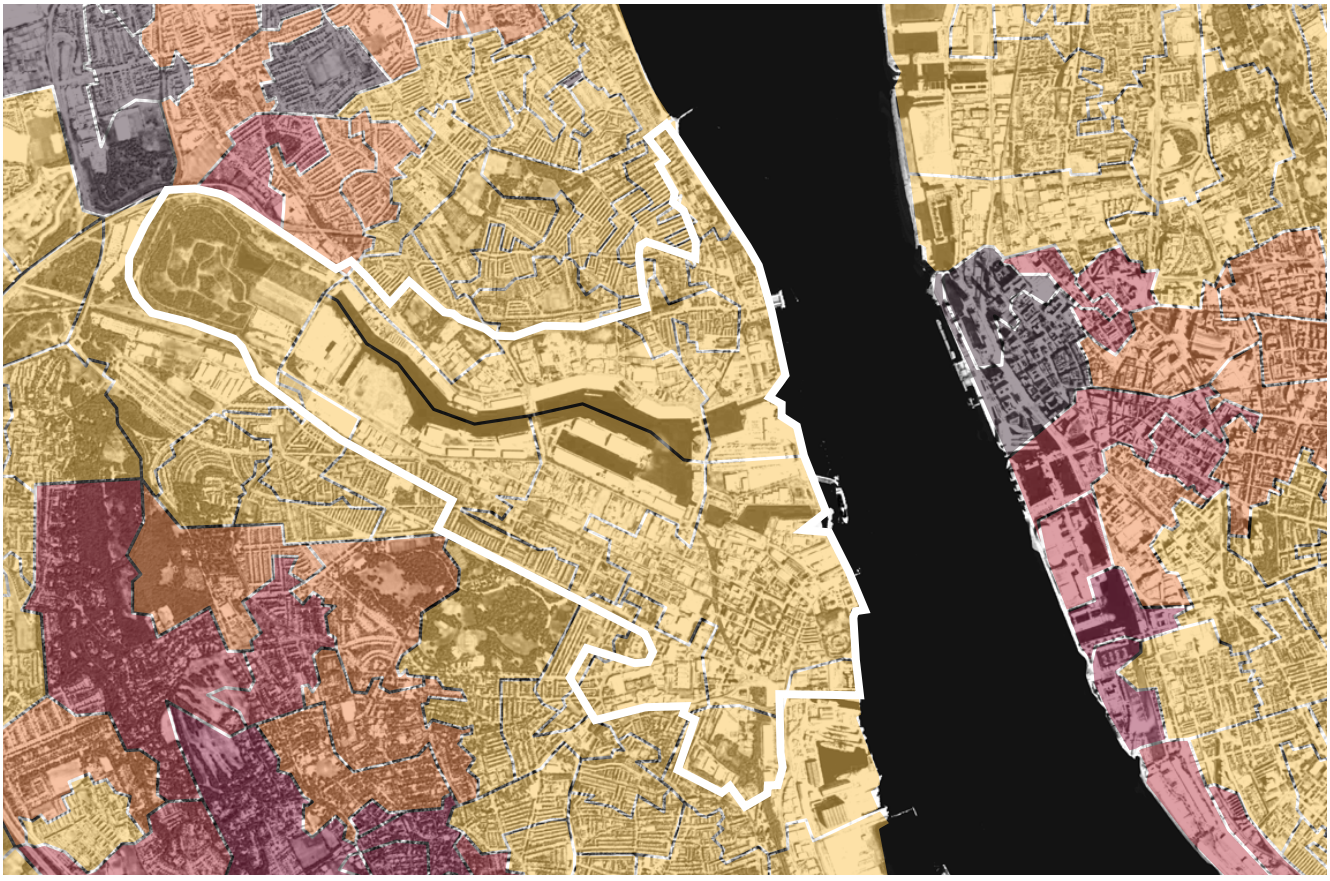


Low income

High income

*According to the data provided by Wirral Intelligence Service

Demographics
Index of multiple deprivation 2019

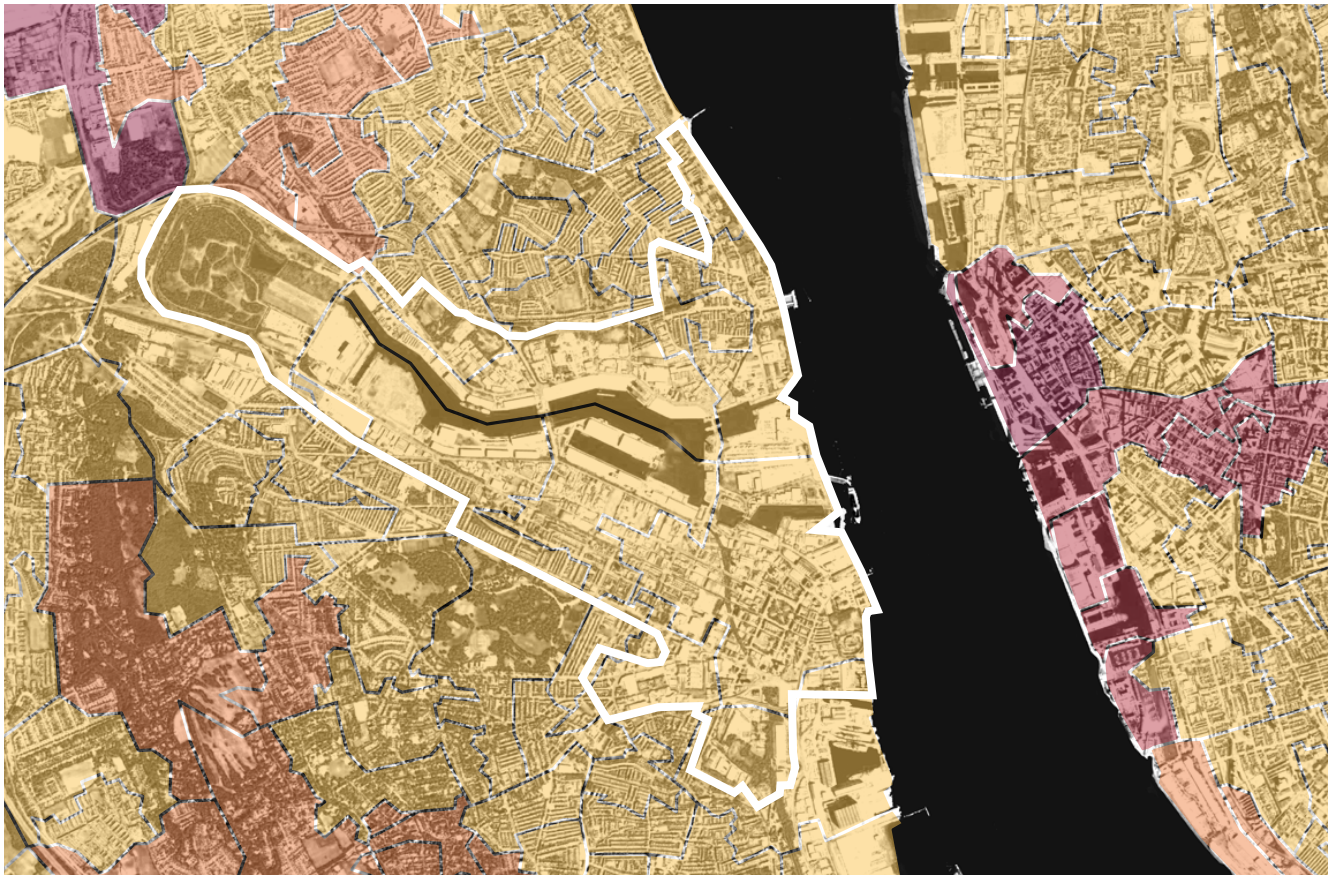


Most deprived

Least deprived

*According to the data provided by Wirral Intelligence Service

Demographics
IoD 2019 Health deprivation and disability rank



Most deprived

Least deprived

*According to the data provided by Wirral Intelligence Service

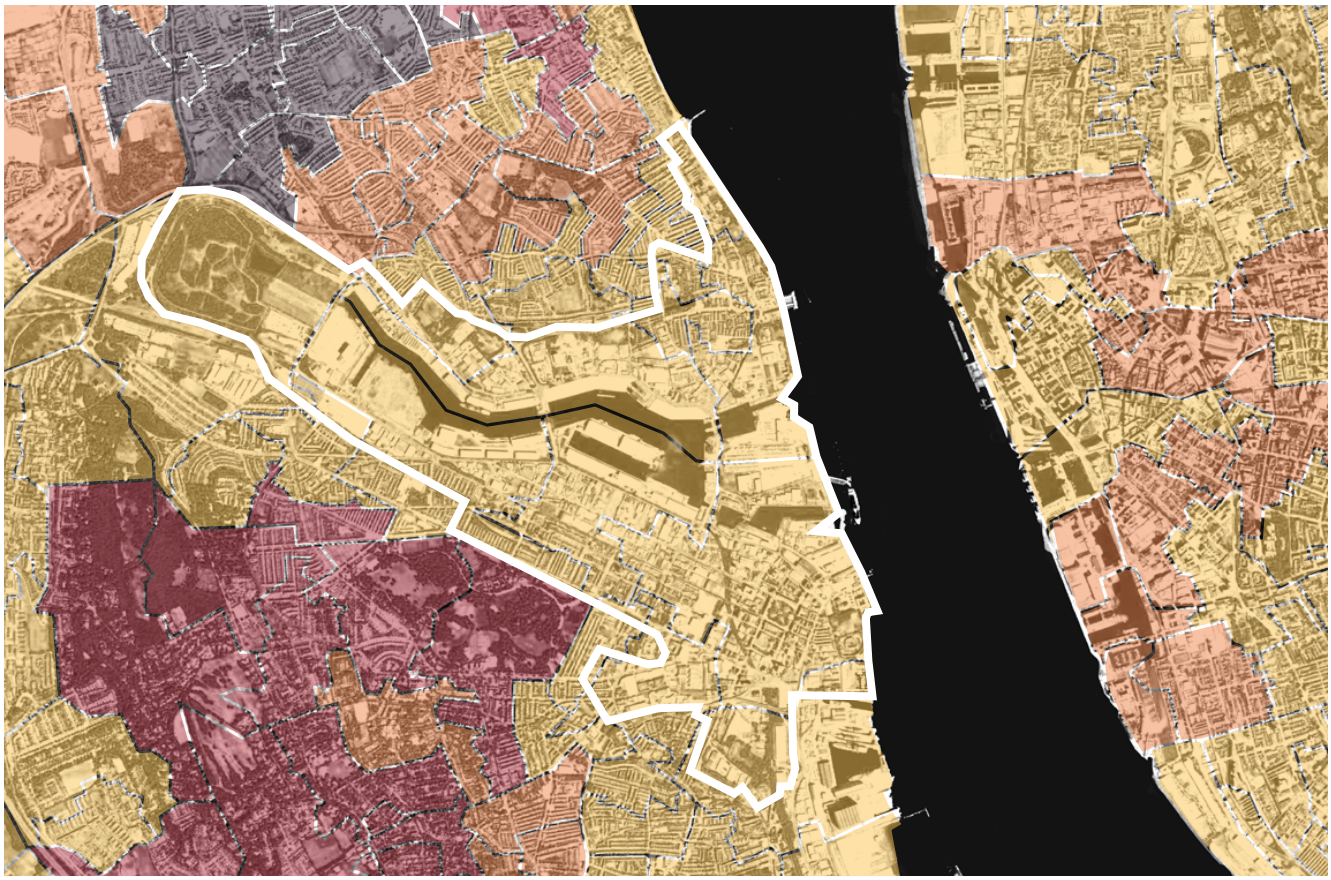
Birkenhead
Health services

- GP
- Dentist
- Pharmacies

Despite the sufficient amount of the healthcare providers and related services, the region remains rather deprived in comparison to the rest of England. Rare health promotion events campaigns and measures are common reasons for such discrepancy.

*According to the data provided by Wirral Intelligence Service

Demographics
People with literacy skills at entry level 1 or below



Most literate

Least literate

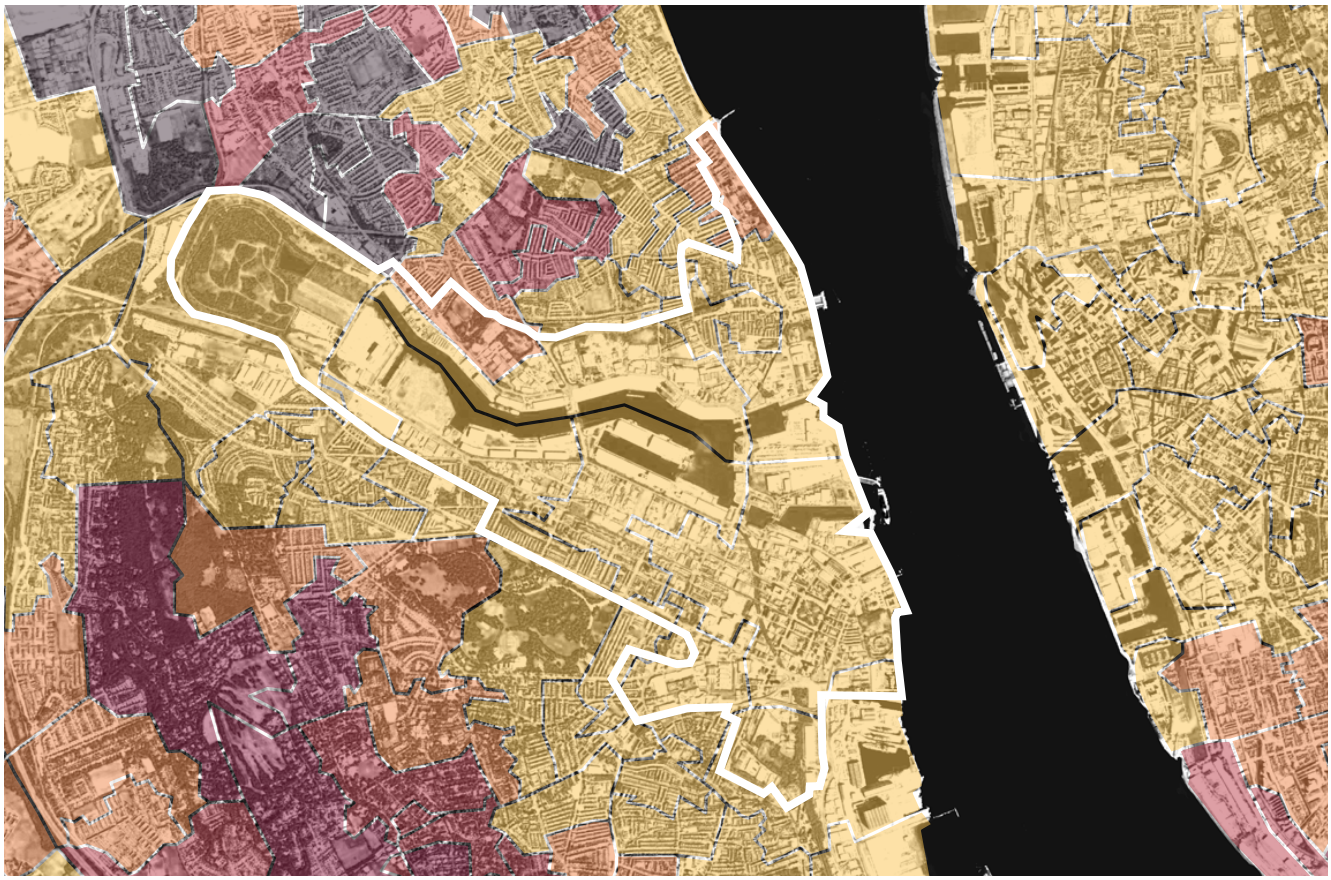
*According to the data provided by Wirral Intelligence Service

Birkenhead
Educational facilities

- Chidren's centers
- Primary schoold & Early Years
- Secondary schools & Further
- Special Schools
- Colleges and training centers

Birkehhead provides adequate amount of primary and secondary level educational facilities. However, with only few colleges, Birkenhead students prefer to continue their academic journey in universities of Liverpool.

Demographics
Total crime offences

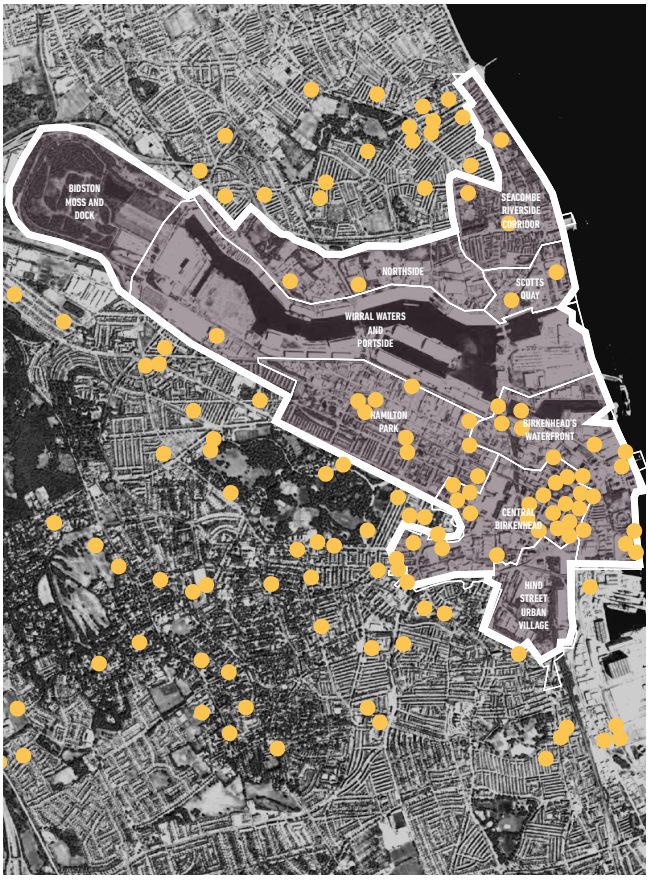


Most offenses

Least offenses

*According to the data provided by Wirral Intelligence Service

Birkenhead
Social Communities & Organisations



Social Communities & Organisations

Birkenhead is abundant with social communitites and organizations. High concentration of those faicilities can be seen in planned Central Birkenhead district, whereas the rest is spread mostly outside the Wirral Waters limits. Wirral Waters development could potentially fill in the gaps in existing structures.

Birkenhead
Sports and outdoor recreation

- Parks and gardens
- Fitness centers
- Playgrounds
- Sport fields

There is a few indoor and outdoor sports and sports related facilities, right around the project area and within its sputhern part. None of the existing amenities overlap with Bidston Moss - prospective leisure distrcit.

Birkenhead
Culture and leisure

- Leisure centers
- Libraries
- Cinema
- Theaters
- Religious institutes

Cultural and leisure opportunities are fairly homogenous and mostly constitute of churches and other religious facilities. The recreational program can be characterized as lackluster and lacking variety of choices.

Deprivation level
Birkenhead in England scale

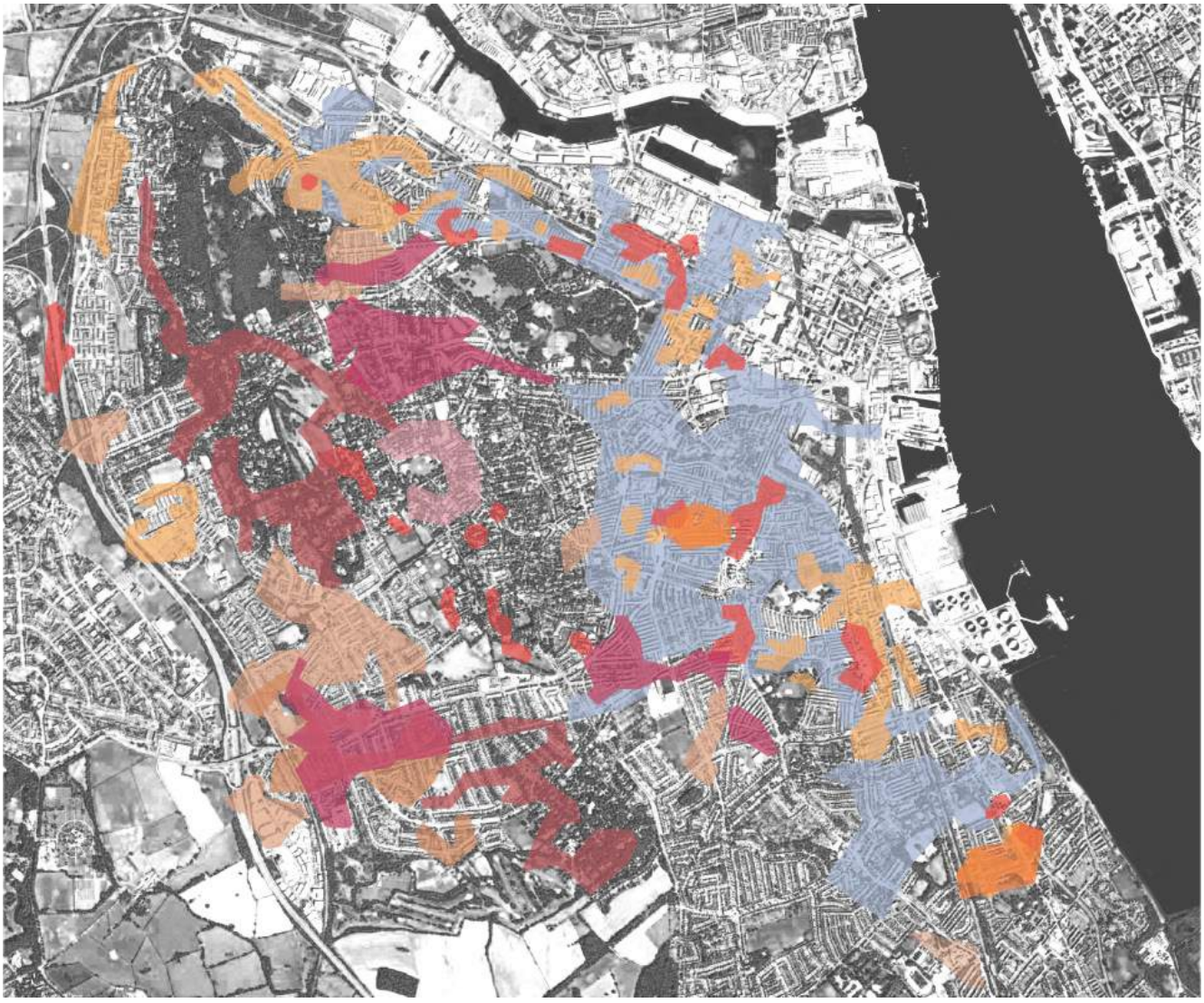
Number of people in Birkenhead Constituency living in the most deprived 20% of areas of England by Indices of deprivarion (IoD) 2019 domain according to the Ministry og Housing, Communitites and Local Government

Income domain	Employment domain	Education domain
53,729	58,538	41,258
Birkenhead - 59,6% England - 20,0%	Birkenhead - 64,9% England - 19,5%	Birkenhead - 45,7% England - 19,7%

Health domain	Living environment domain	Crime domain
69,095	39,613	35,784
Birkenhead - 76,6% England - 19,5%	Birkenhead - 43,9% England - 20,9%	Birkenhead - 39,7% England - 20,4%

Social profile
Defining groups

A	COUNTRY LIVING	Well-off owners in rural locations enjoying the benefits of country life
B	PRESTIGE POSITIONS	Established families in large detached homes living upmarket lifestyles
C	CITY PROSPERITY	High status city dwellers pursuing careers with high rewards
D	DOMESTIC SUCCESS	Thriving families who are busy bringing up children and following careers
E	SUBURBAN STABILITY	Mature suburban owners living settled lives in mid-range housing
F	SENIOR SECURITY	Older people with assets who are enjoying a comfortable retirement
G	RURAL REALITY	Householders living in inexpensive homes in village communities
H	ASPIRING HOMEMAKERS	Younger households settling down in housing priced within their means
I	URBAN COHESION	Residents of settled urban communities with a strong sense of identity
J	RENTAL HUBS	Educated young people privately renting in urban neighbourhoods
K	MODEST TRADITIONS	Mature homeowners of value homes enjoying stable lifestyles
L	TRANSIENT RENTERS	Single people privately renting low cost homes for the short term
M	FAMILY BASICS	Families with limited resources who have to budget to make ends meet
N	VINTAGE VALUE	Elderly people reliant on support to meet financial or practical needs
O	MUNICIPAL CHALLENGE	Urban renters of social housing facing an array of challenges



*According to the data provided by Mozaic group

Social profile
Birkenhead's social portrait

A	COUNTRY LIVING
B	PRESTIGE POSITIONS
C	CITY PROSPERITY
D	DOMESTIC SUCCESS
E	SUBURBAN STABILITY
F	SENIOR SECURITY
G	RURAL REALITY
H	ASPIRING HOMEMAKERS
I	URBAN COHESION
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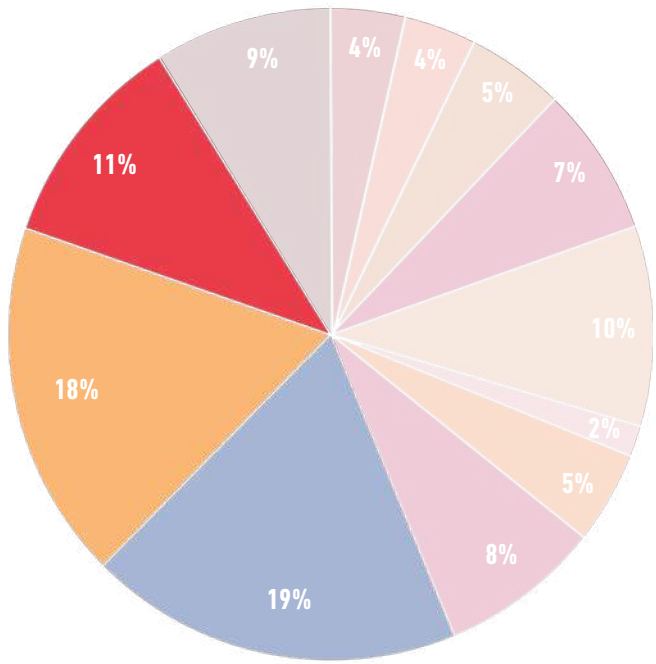


Social profile
Prevailing groups

TRANSIENT RENTERS

18-25 y.o. terraced 20-29k

- Private renters
- Low length of residence
- Low cost housing
- Singles and sharers
- No children
- Older terraces
- Few landline telephones

FAMILY BASICS

31-35 y.o. terraced <15k

- Families with children
- Aged 25-40
- Limited resources
- Some own low-cost homes
- Some rent from social landlords
- Squeezed budget

VINTAGE VALUE

76-80 y.o. purpose-built flats <15k

- Elderly
- Living alone
- Low income
- Small houses and flats
- Need support
- Low technology use

*According to the data provided by Mozaic group

Wirral Local Plan and WW development
Social issues

Economy	- Ensure sustainable growth and economic revitalisation in the Boroug; - Reverse the loss of population from the older urban areas in East Wirral, and Birkenhead in particular; - Help to close the gap between social economic and environmental conditions and opportunities among the population.
Housing	- Improve the quality and suitability of existing housing and business stock in the urban core; - Rebalance the housing market in size, tenure and type of housing; - Ensure affordable housing and specialist housing to meet the needs of an ageing population and groups with other special housing need.
Health	- Consider adjusting the amount of healthcare prociders according to the new amount of inhabitants after the WW implementation; - Popularize the importnce of planned monitoring; - Development of health service in East Float and Bidston Dock.
Education	- Predicted flow of new inhabitants will require the growth of the educational sector and higher education opportunities in particular; - Maritime knowledge Hub is planned.
Space	- Address the legacy of industrial change in the Borough by unlocking vacant and underused previously developed land; - Provide high quality design in developments and places, that meet excellent standards for healthy living and have low environmental impact; - Prioritise sporst, leisure, and culture and secure it by regulations from private developmnents.
Safety	- Focuses on environmental protection with no mention of social safety.
Culture	Improve the vitality of declining town and village centres and support the continuation of healthy centres; Strivig to cultural development, lacking detalisation for implementation.

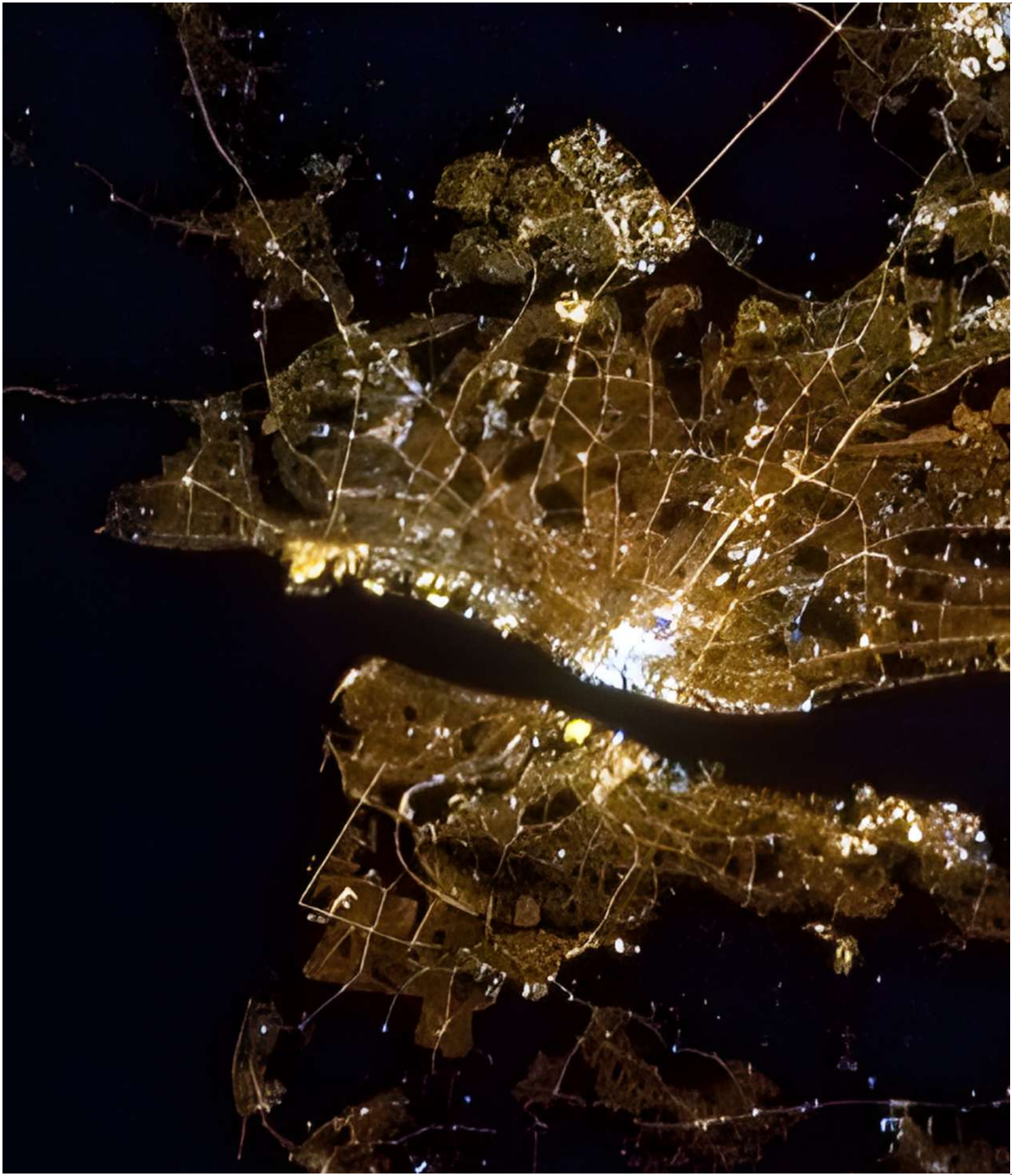
Conclusions
Identifying the Blind spot

Our research leads us to believe that immense work and right intentions of Birkenhead framework attempts to improve life quality for locals, however, it is not reflected in the intended measure. Those measures do not exactly consider the changes in social domain brought by the impplementation of aforementioned framework and lack some detailing. **The comparison of the existing situation against the data regarding social profile and demographics of the city identifies interaction between current population with those drawn to town by new opportunities as a blind spot.**

The framework prioritizes the creation of a cultural axis and a local identity, nonetheless the local plan and other relevant documents do notmention specific events and spatial developments to support that idea. This inconsistency can be traced through the new major developments, majority of which are either commercialor residential projects.

The proposed solution, though targetting the most pivotal and urgent social problems, is seemingly devising a map of a new city in full disregard to the existing conditions. Logical and effective solution for crime rate, housing crisis, income level, social inequailty and other major problems indicated by th reseacrh do not seem to take into account the level of education, economical and physical opportunities of locals.

R5



WIRRAL WATERS

GREY STRUCTURES: MOBILITY RESEARCH

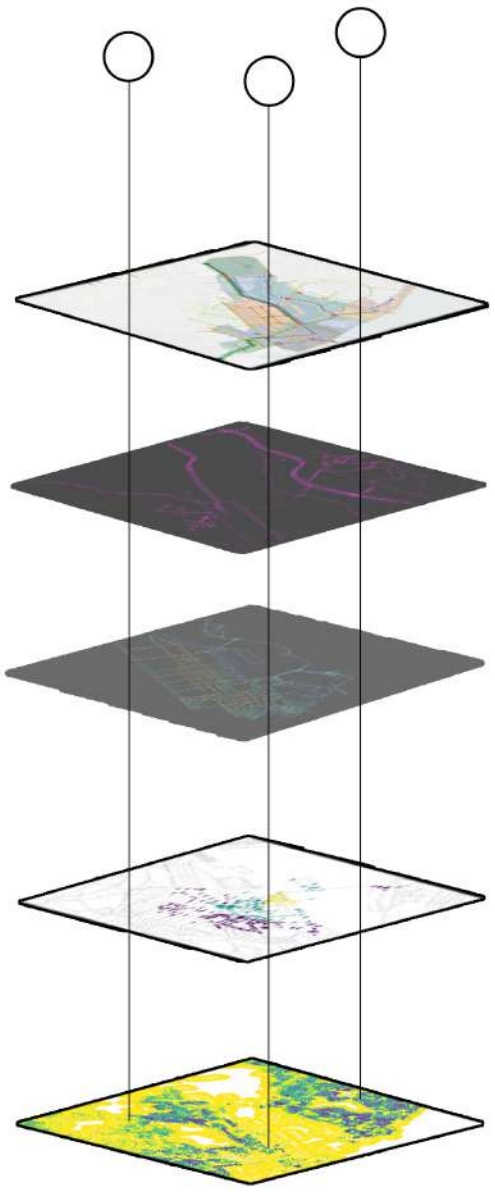
RISEBA FAD

Andrejs Kopils
Sergejs Kopils

RIGA | 2024

Planning documents

The urban research on Wirral Waters extensively analyzed strategic documents, focusing on enhancing connectivity and urban mobility. It explored the "2040 Framework" for a spatial vision of accessible, sustainable neighborhoods, emphasizing pedestrian and cycling networks within the "Connectivity Framework." Innovative concepts like the City Boulevard, "Street Car," and 15-minute neighborhoods addressed commuting challenges, promoting a cohesive, well-connected urban fabric. The "Movement Framework" outlined principles for sustainable transport, landscape enhancement, and public realm improvement, complemented by a "Movement Strategy" advocating for mass transit loops. This comprehensive study aimed to shape Wirral Waters into a model of integrated, sustainable urban living.



Movement strategy from Wirral planning documents

Public GPS, general and fitness trackers data

Space syntax analysis with DepthMapX software

Walkability and connectivity analysis OSMNX library

Urban analysis with Momepy python library

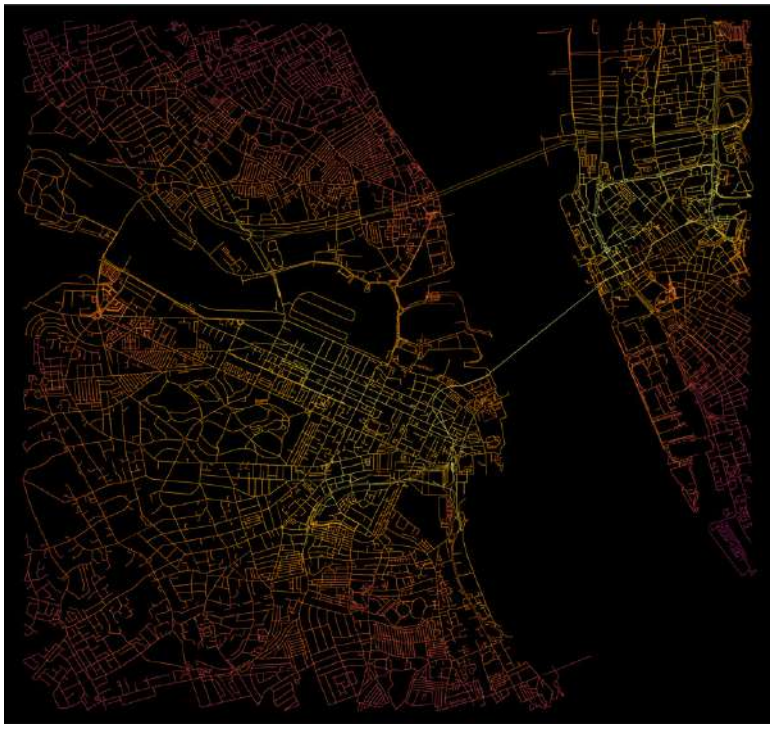
Blind spots reseach strategy

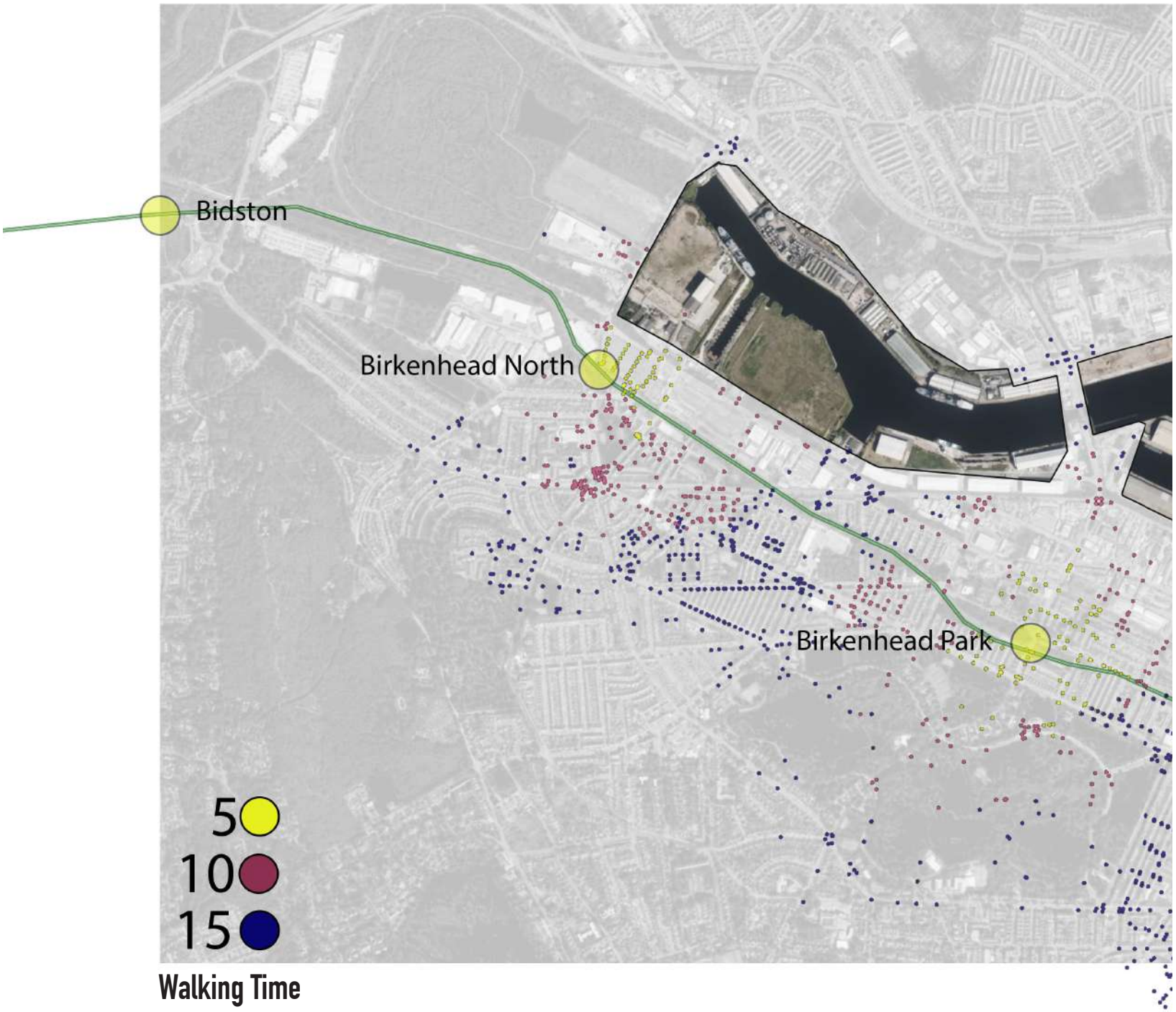
The research on Wirral Waters employed a layered approach to identify blind spots by overlaying movement strategies from local documents with public GPS and fitness tracker data. Utilizing DepthMapX, the study analyzed spatial configurations and their impact on movement. Further, it employed the OSMNX library for a detailed examination of walkability and connectivity, and the Momepy library for a broader urban analysis, focusing on morphological aspects such as street connectivity. This comprehensive methodology aimed to bridge the gap between theoretical planning and actual spatial usage, offering insights for more effective urban development in Wirral Waters.

Street Centrality Analysis

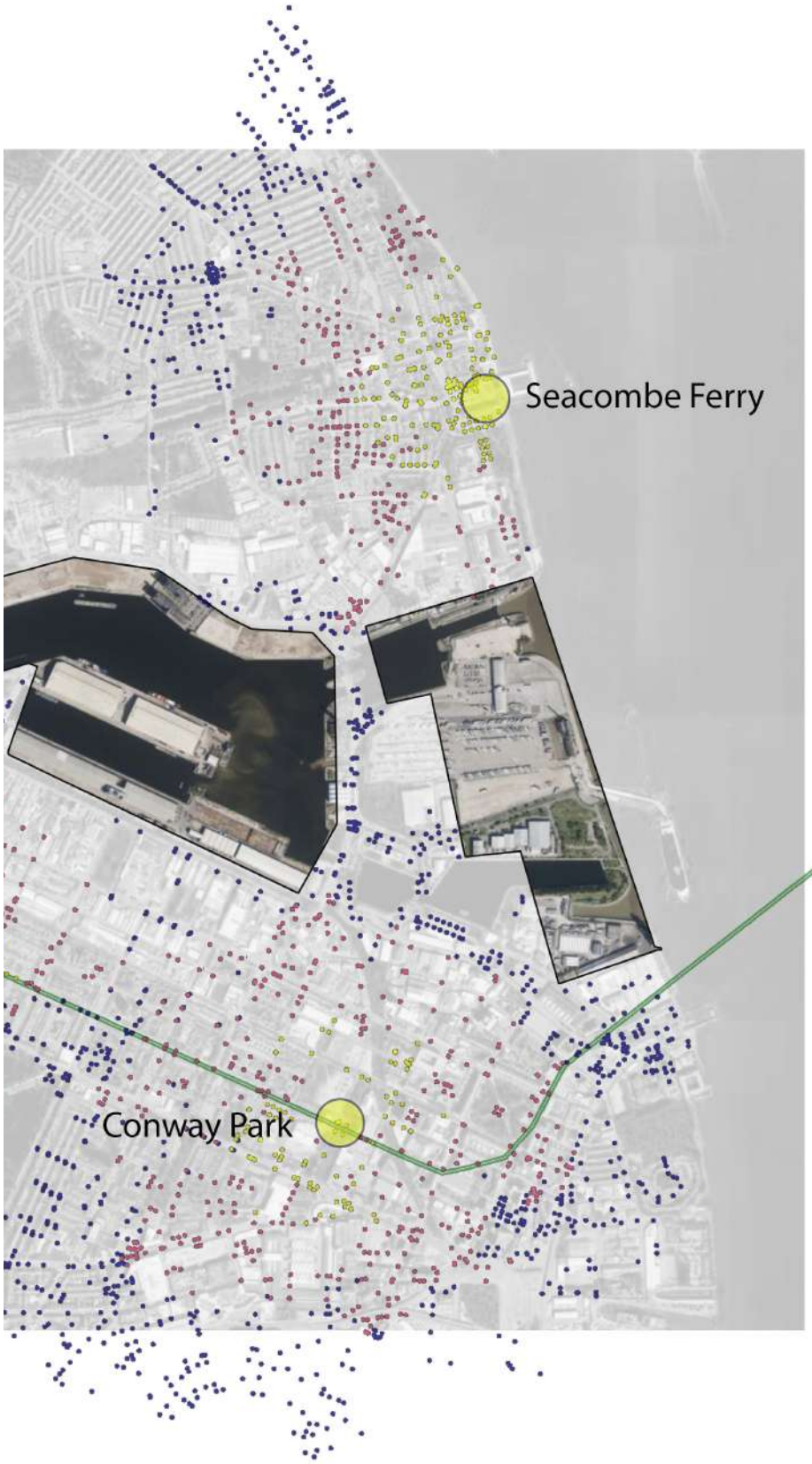
Street centrality analysis is a crucial component in understanding the urban dynamics of Wirral Waters concerning the broader Liverpool and Wirral area. Wirral Waters, a massive waterfront regeneration project, occupies a pivotal location at the confluence of the River Mersey and the Irish Sea. Its street centrality is intrinsically linked to its strategic position as a gateway to both Wirral and Liverpool.

This analysis delves into the patterns of street connectivity, traffic flow, and accessibility to assess Wirral Waters' role as a potential transportation hub and catalyst for economic activity. By examining its centrality in the context of the broader urban landscape, this analysis sheds light on how Wirral Waters can shape the connectivity and accessibility of the entire region, contributing to its sustainable growth and development.





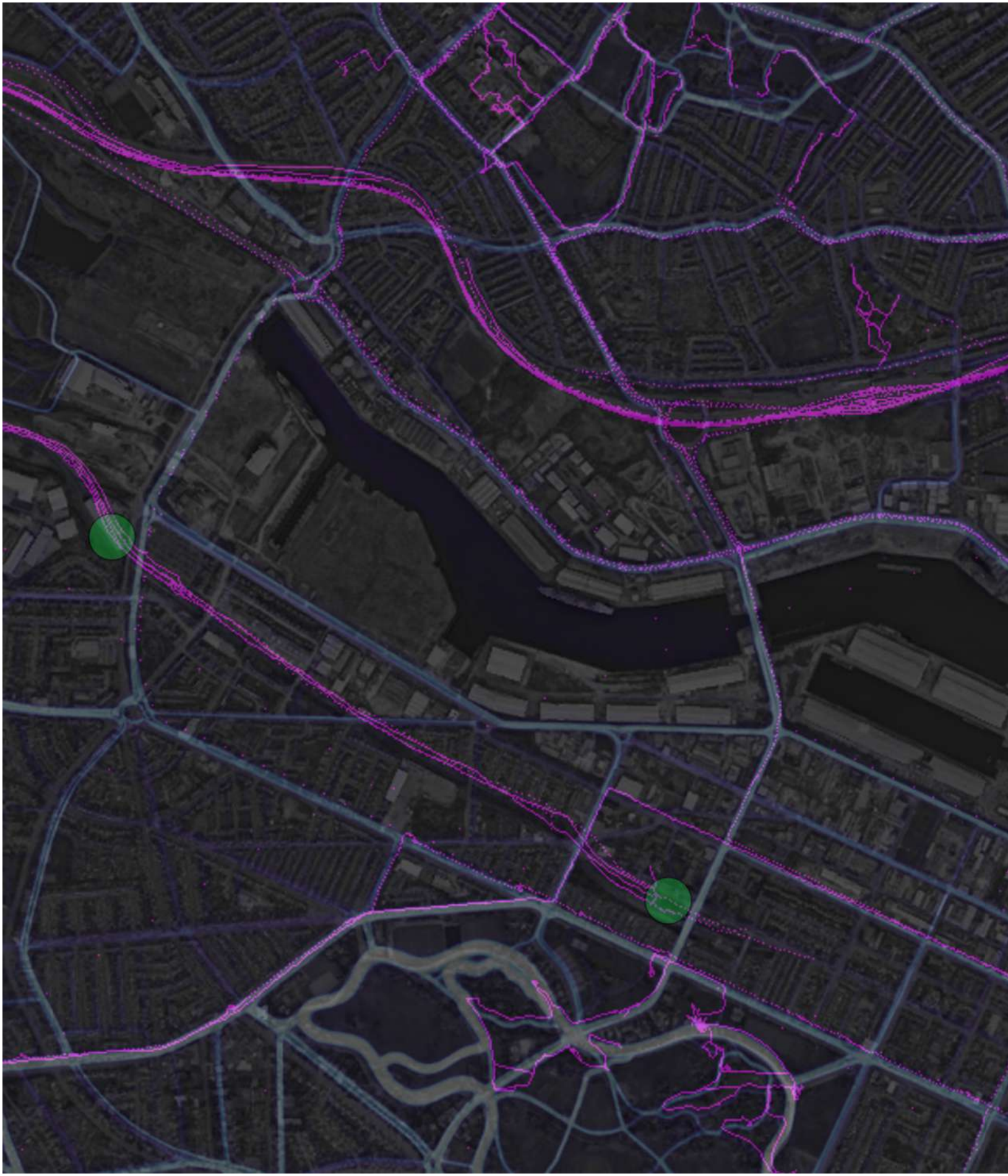
Walking Time

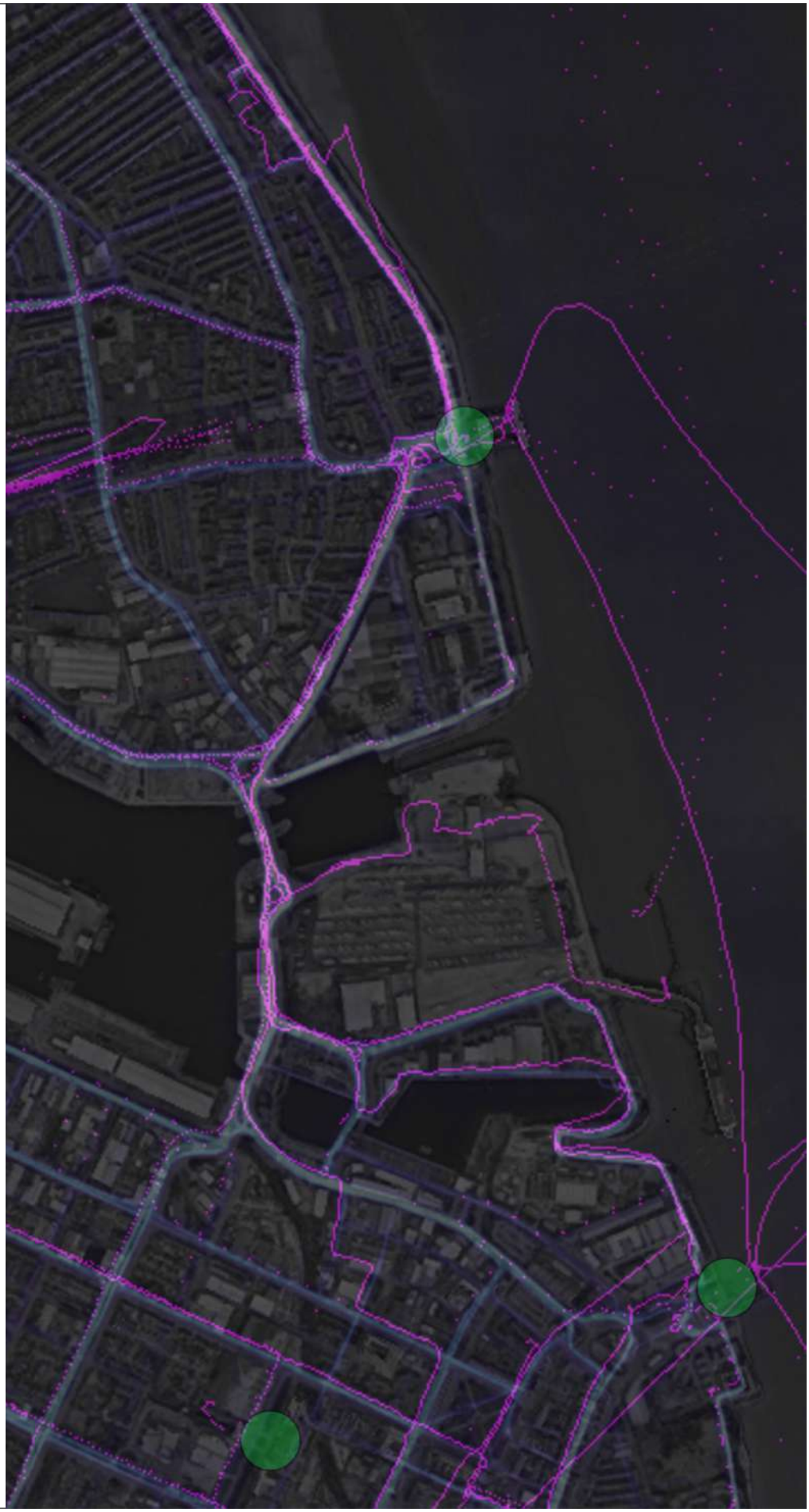


15 Minutes City Gaps

This diagram epitomizes the conceptual essence of urban mobility within Wirral Waters, articulating a vision of a 15-minute neighborhood and a walkable urban fabric. It distills the spatial dynamics into a coherent narrative of accessibility, where essential amenities and communal spaces converge within a quarter-hour's reach on foot. The interplay of pathways, nodes, and landmarks is meticulously charted, underscoring the symbiosis between pedestrian flows and the urban milieu. Anchoring this tapestry is the pivotal node of train arrival, seamlessly integrating regional connectivity with the local rhythm. The diagram serves not just as a map, but as a manifesto for a holistic, pedestrian-centric urbanism, where every stride resonates with the broader cadence of sustainable, community-oriented living.

Need For New Conenctions





Tracing movement

This map diagram integrates two layers of public GPS data to provide a comprehensive overview of urban mobility. The first layer represents general movement data, encompassing all forms of transit including cars, trains, and public transport, highlighting the city's primary transportation arteries and hubs. The second layer, sourced from fitness apps, zeroes in on walkability and cycling patterns, pinpointing areas frequently used by pedestrians and cyclists. Together, these layers offer a multifaceted view of urban dynamics, shedding light on the interplay between various modes of transport and the preferences of active commuters, thereby informing targeted improvements in city infrastructure and promoting sustainable mobility solutions.

Data from fitness app

General public data

Arrival points

General public data

Data from fitness app

Arriving by car

Duke St Bridge

Tower Rd Bridge

Park Rd N

Arriving by public transport

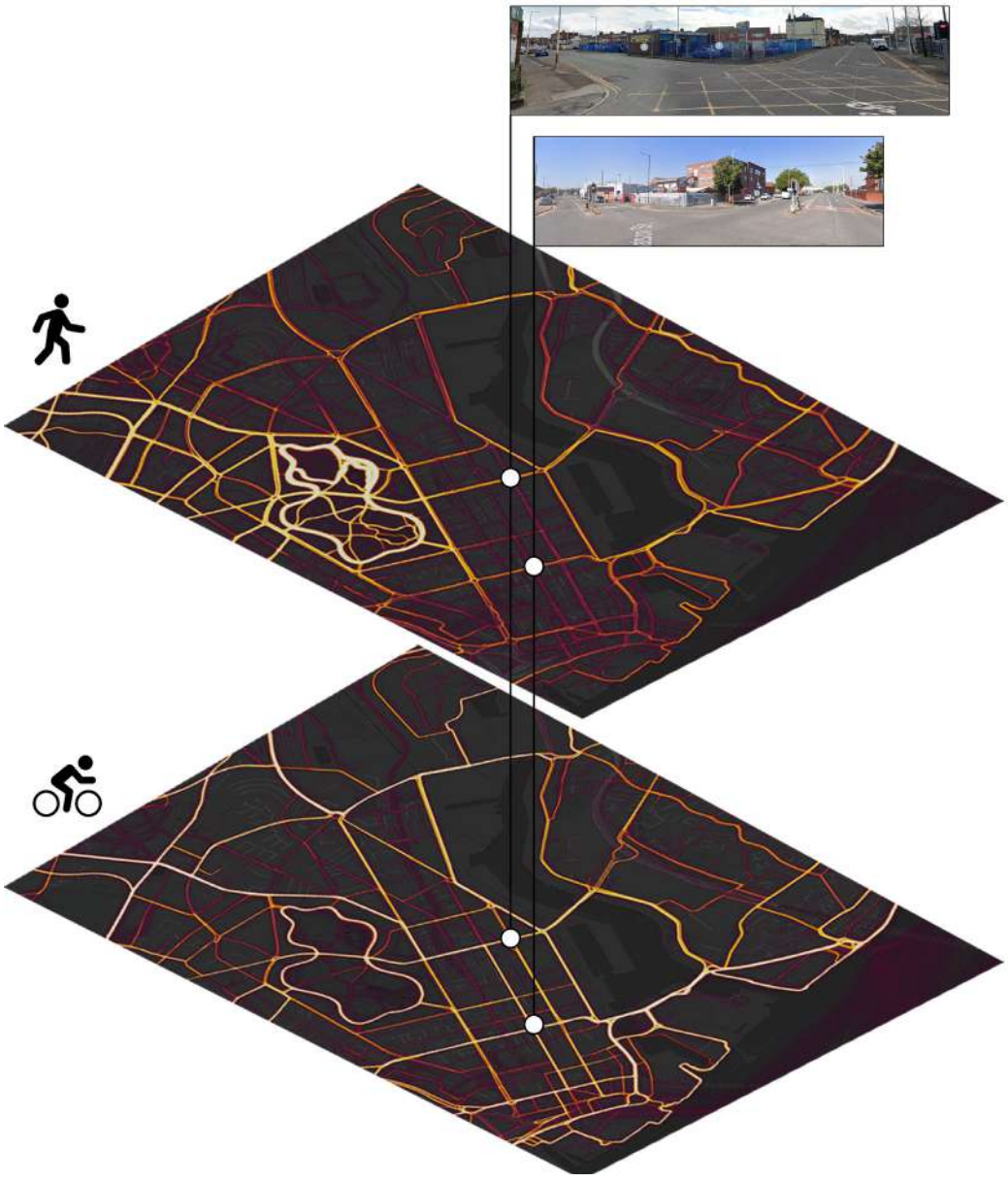
Seacombe Ferry

Birkenhead Park Station

Conway Park Station

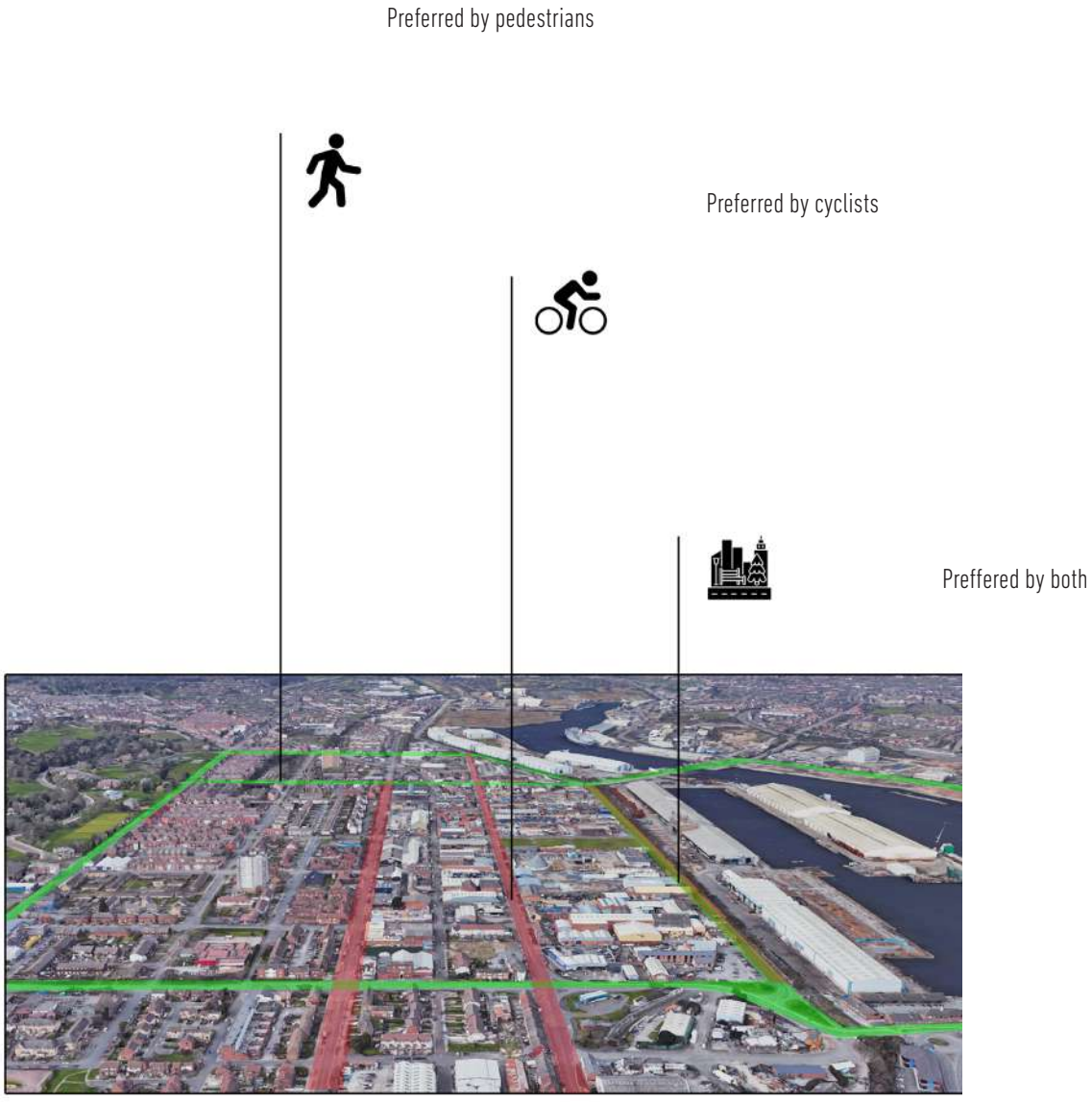
Sustainable smart transport

Arrival points in Wirral Waters, including key access routes like Duke St Bridge, Tower Rd Bridge, and Park Rd N for car arrivals, alongside Seacombe Ferry, and Birkenhead Park and Conway Park rail stations for public transport, play a crucial role in the area's accessibility. These entry points not only facilitate the seamless flow of residents and visitors into Wirral Waters but also hold potential as sites for future smart transport developments. Envisioning these locations as hubs for innovative transport solutions could significantly enhance the efficiency and sustainability of urban mobility in the area. By integrating smart technologies, such as real-time traffic management systems, electric vehicle charging stations, and digital information displays, these arrival points could transform into more than just entryways; they could become gateways to a forward-thinking, connected urban experience. This approach would not only improve the ease of access but also contribute to the broader goals of reducing traffic congestion, minimizing environmental impact, and promoting the use of public and active transport modes. solutions.



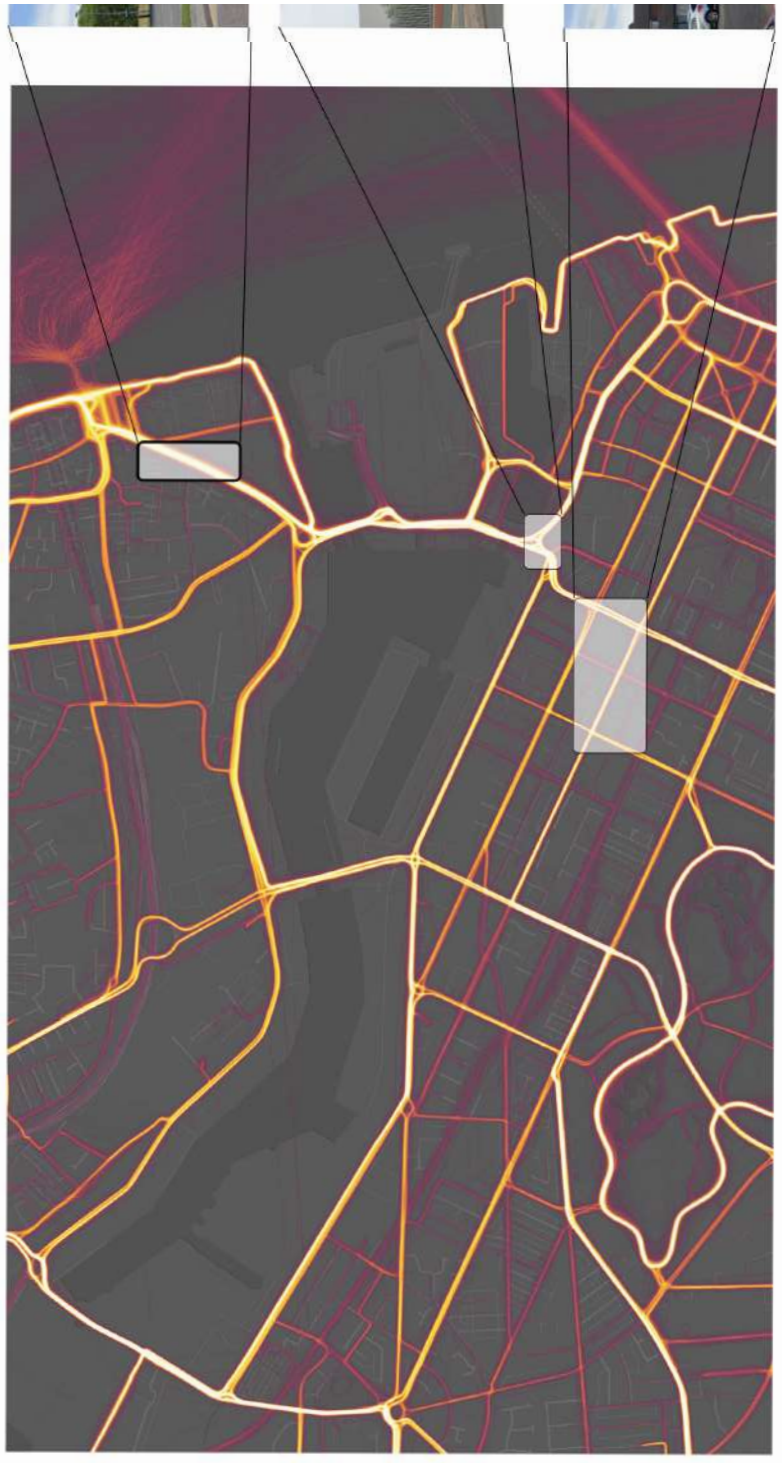
Separating GPS data layers

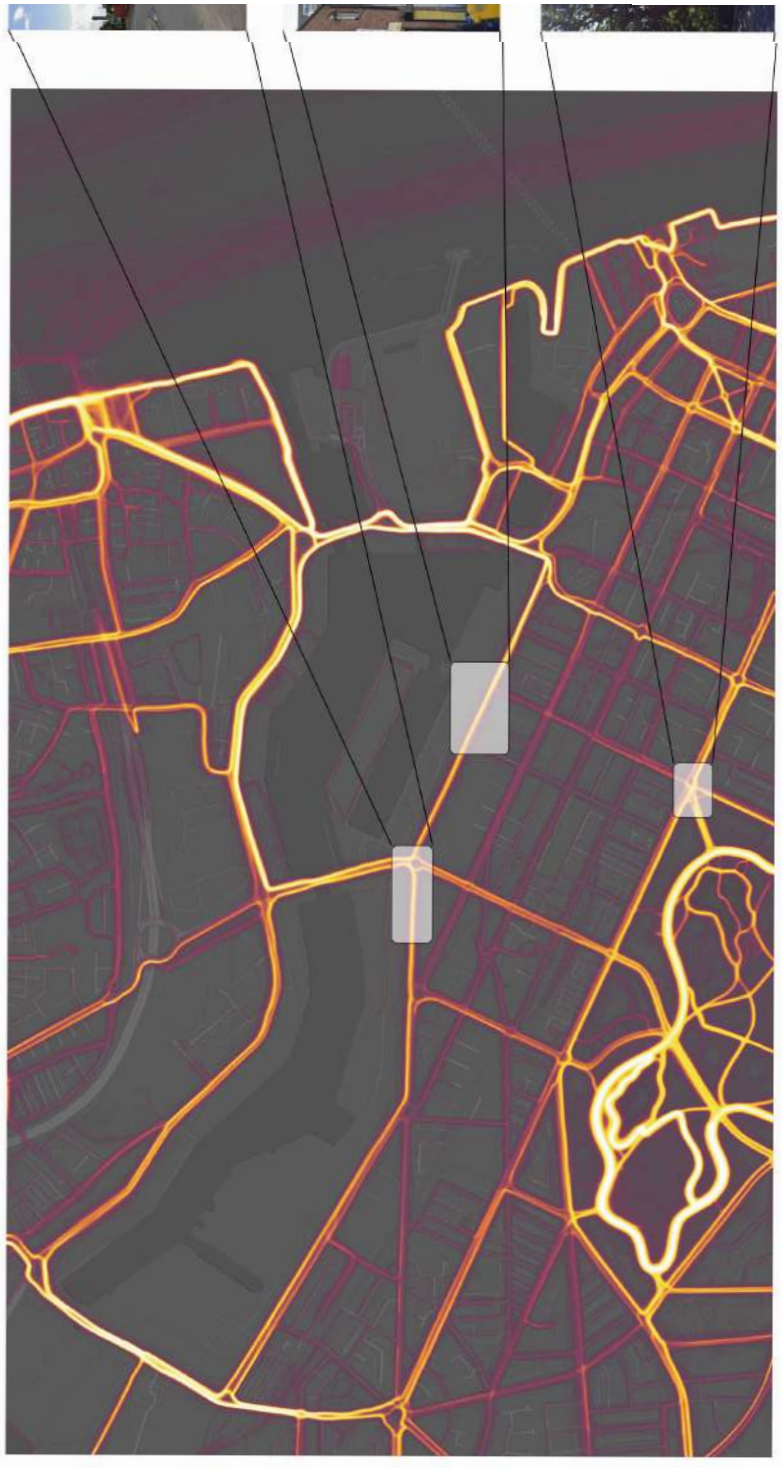
The study examines separate GPS data for walking and cycling in Wirral Waters, showing how different routes are preferred for each activity. The walking data reveals that people often choose scenic routes near greenery or water, valuing the surroundings and leisure aspects of their walk. On the other hand, cyclists tend to pick routes that are direct and smooth, prioritizing speed and safety with dedicated lanes. This comparison highlights the need for diverse urban planning that meets the specific needs of walkers and cyclists, ensuring a balanced and accommodating environment for all types of movement.



City Boulevard

The proposed location for the city boulevard, as derived from the analysis of GPS data, aligns seamlessly with the pathways frequented by both pedestrians and cyclists, indicating a natural convergence of urban flow. This route, already a popular choice among active commuters, embodies the ideal canvas for the city boulevard, promising to enhance the urban landscape while catering to the innate travel patterns of the community. The data suggests a harmonious blend of accessibility and scenic allure along this route, making it an optimal choice for a boulevard that champions walkability and cycling.






Birkenhead Rd

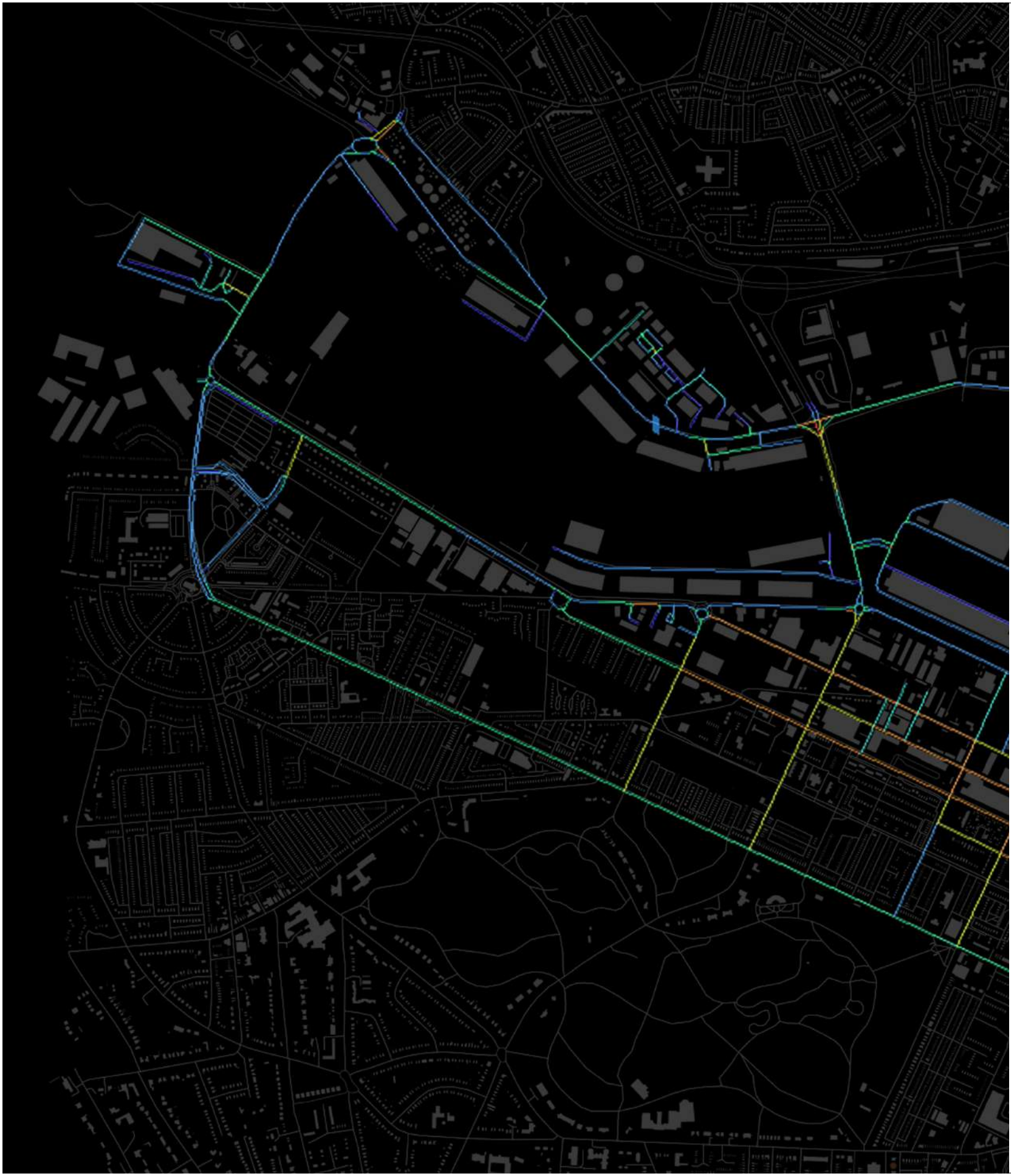

Egerton Dock area

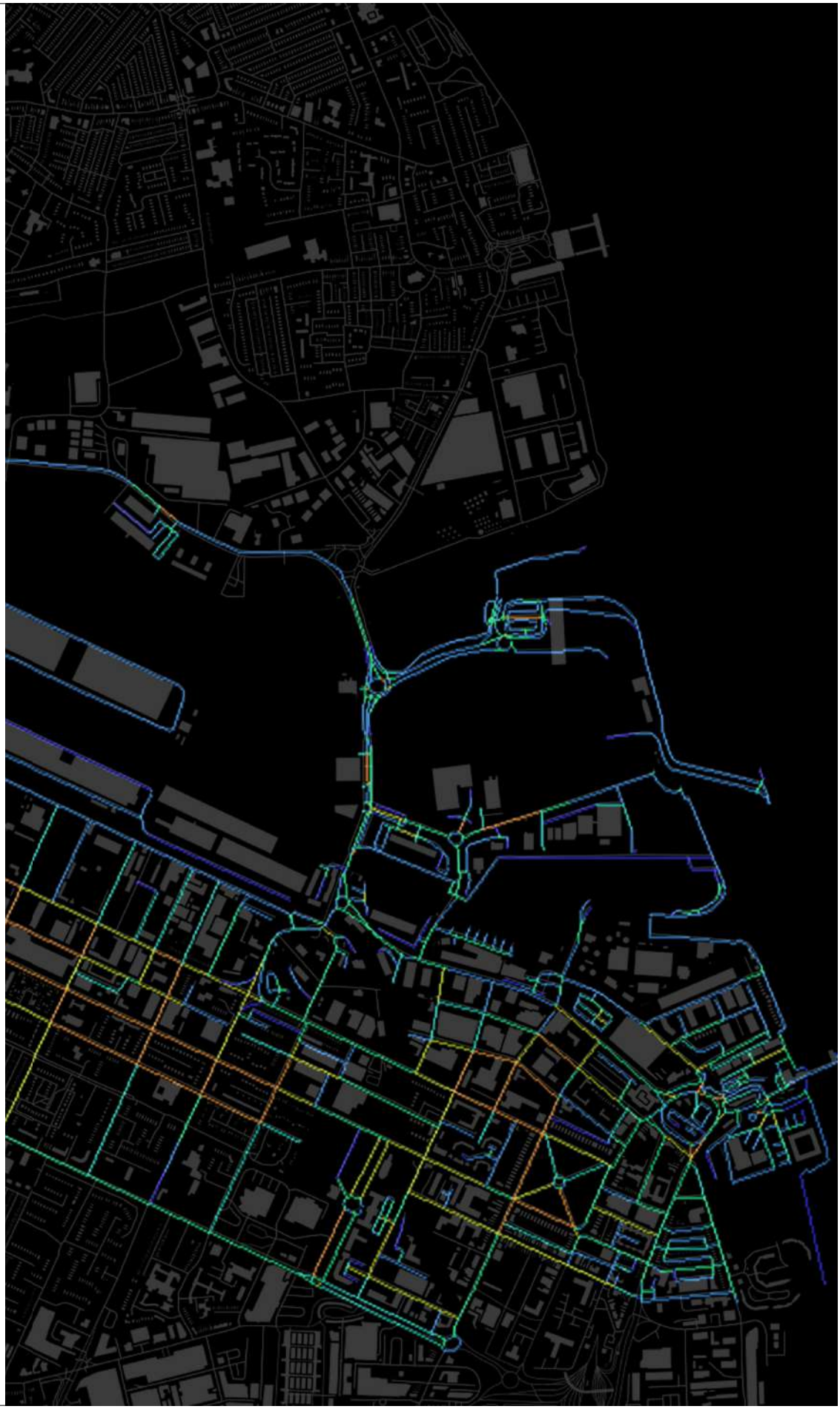

Price St and Cleveland st area


Corporation Rd


City Boulevard proposed area


Birkenhead Park area

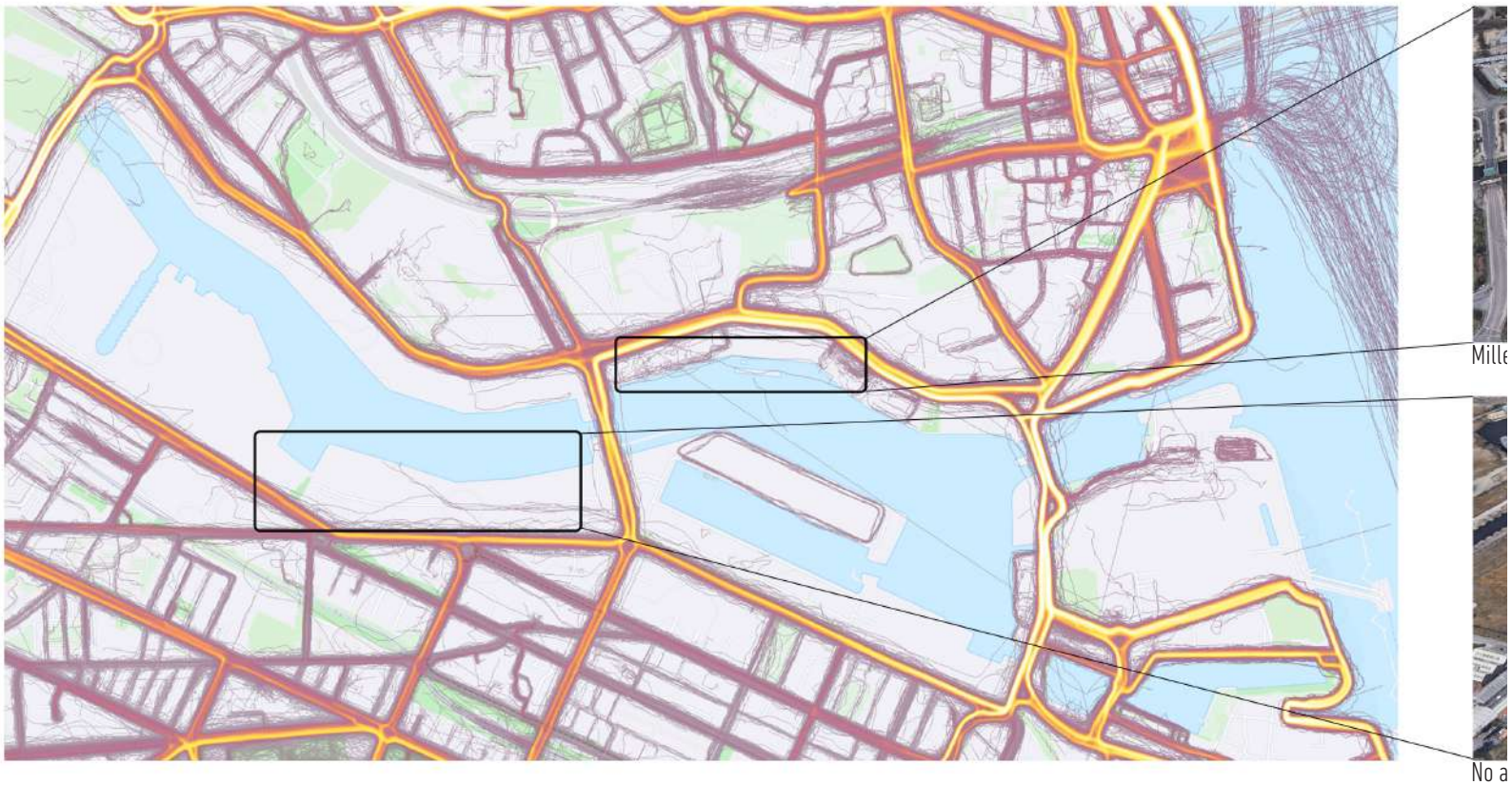




Space Syntax Analysis

The space syntax connectivity map of Wirral Waters presents a detailed visualization of urban flow and interaction. Highlighting the intricate network of paths and nodes, the map offers insights into the spatial structure's influence on movement and social cohesion. It serves as a key tool in understanding and optimizing the area's connectivity, guiding strategic urban planning and development initiatives.

Space Syntax connectivity gradient


Mille
No a


Live
64th

Millers Quay waterfront development

No aceess to waterfront in West Float

Waterfront access

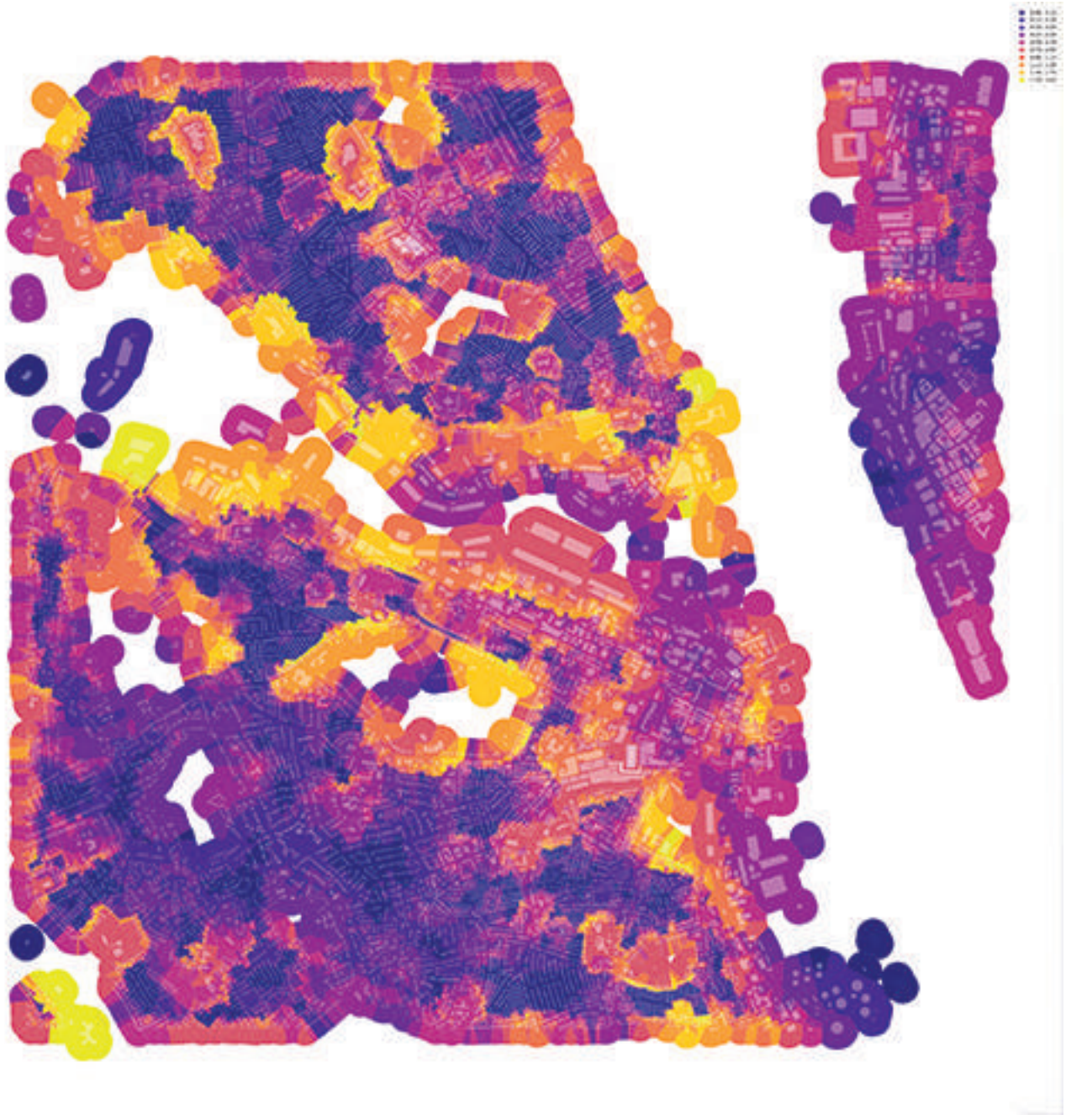
Accessibility to the waterfront in Wirral Waters has been limited, making it hard for people to enjoy the area's water-related benefits. The Millers Quay development aims to fix this by improving public access to the waterfront, making it a lively part of the community. However, in places like West Float, there's still no way to get close to the water, showing a clear need for better access across Wirral Waters. Millers Quay's efforts could lead the way in making waterfront areas more accessible and enjoyable for everyone.

Liverpool Victoria Rowing Club

64th Birkenhead Sea Scout Group Boathouse

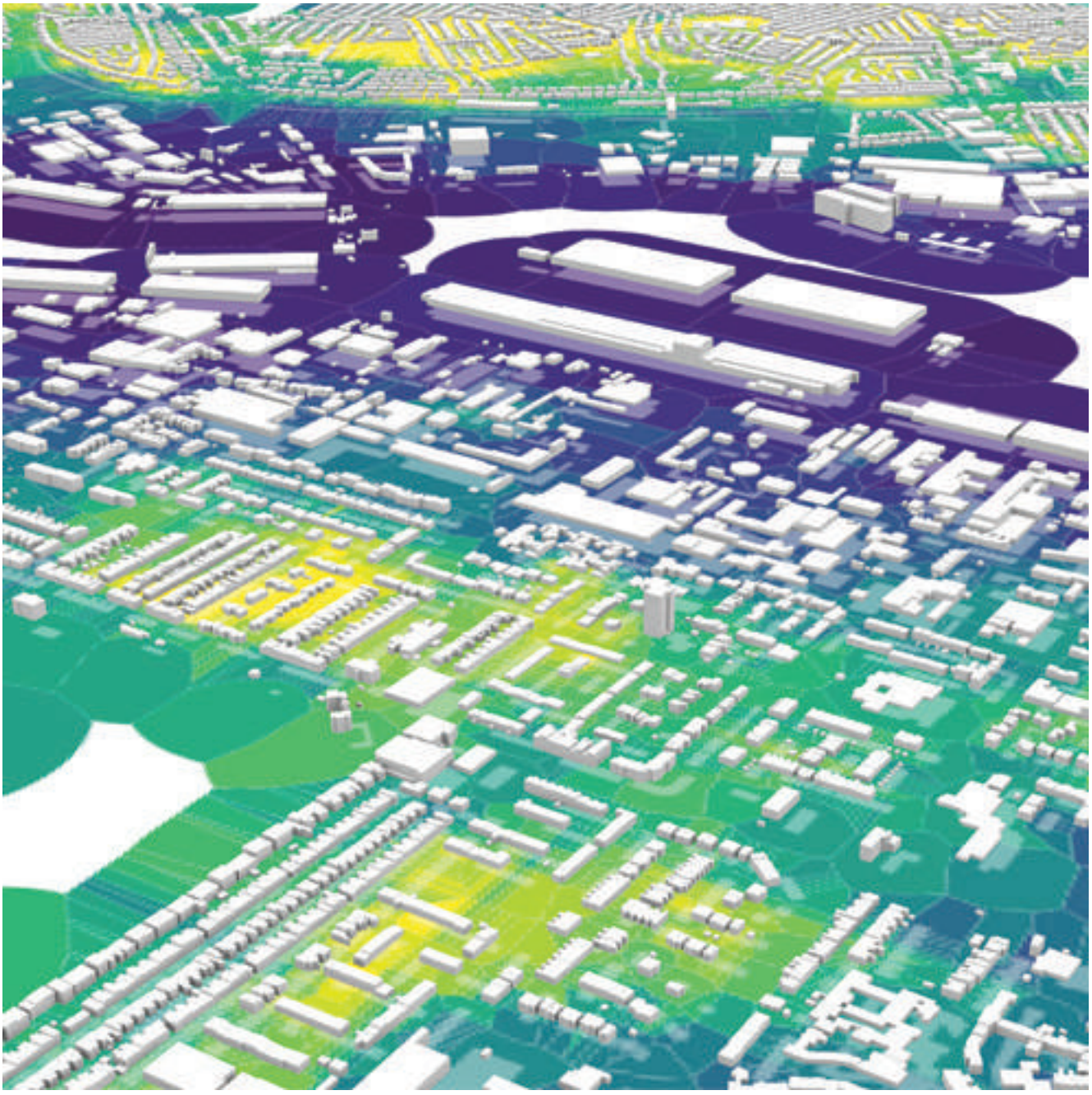
Water traffic

Water activities at Wirral Waters, especially with the 64th Birkenhead Sea Scout Group Boathouse and the Liverpool Victoria Rowing Club, bring life to the waterfront. These places offer fun water sports and act as community spots, making the waterfront a lively area for everyone. They help connect people to the water through activities like rowing and scouting, making the waterfront an active and enjoyable space. This boosts the area's charm and makes it a great place for community events and physical activities.



Urban analysis with Momepy python library

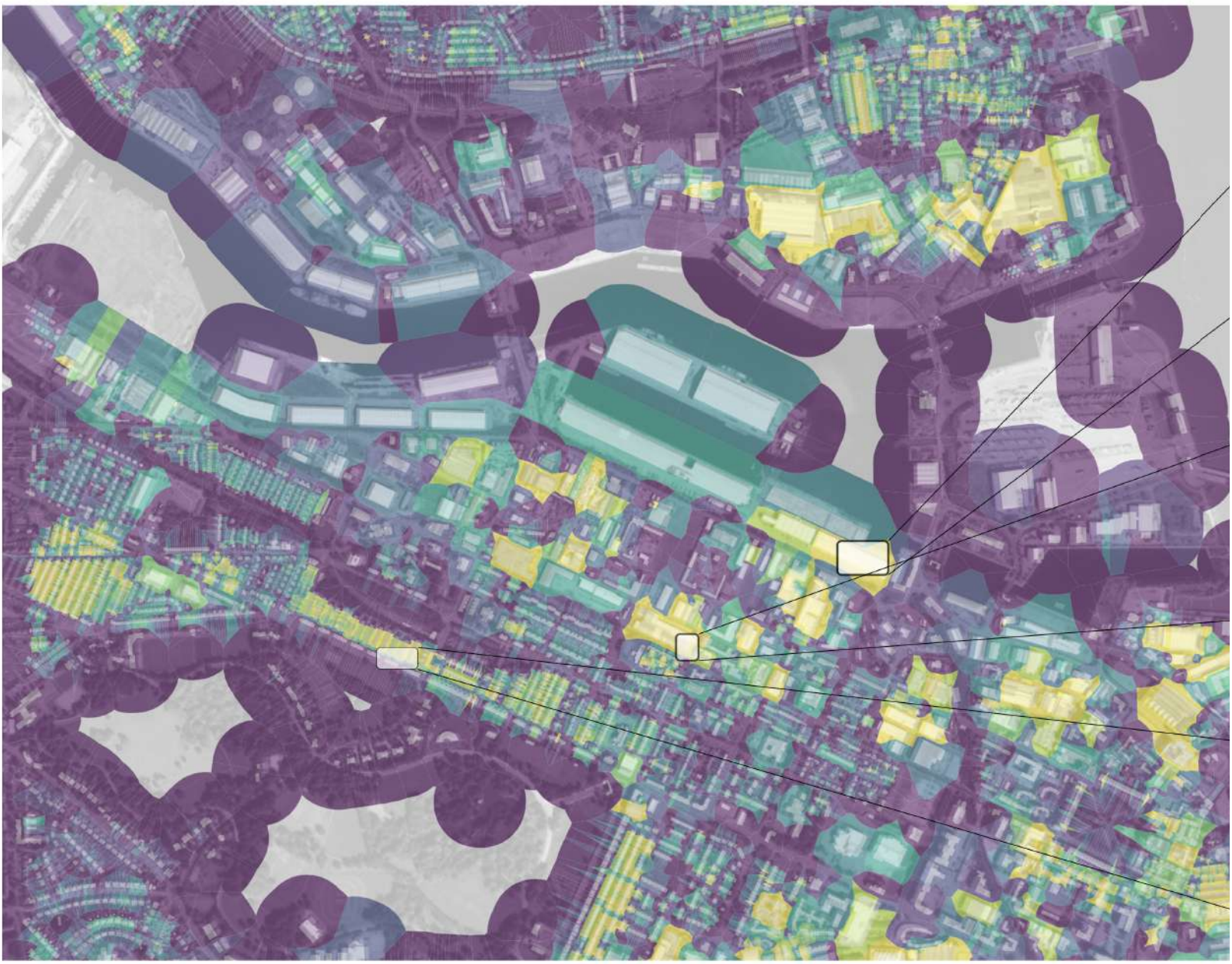
In analyzing Wirral Waters, the Momepy Python library stands out as a pivotal tool, particularly when applying metrics such as the Theil Area Index. This index, a measure of spatial inequality, allows for a nuanced assessment of the area's urban morphology. By dissecting the distribution of built-up areas and open spaces, Momepy facilitates a deeper understanding of urban form and structure. In the context of Wirral Waters, employing the Theil Area Index through Momepy offers valuable insights into the spatial equity of development, shedding light on how land use is organized and its implications for urban livability and sustainability. This analytical approach not only highlights the current state of urban form but also informs potential interventions for a more balanced and harmonious urban landscape.

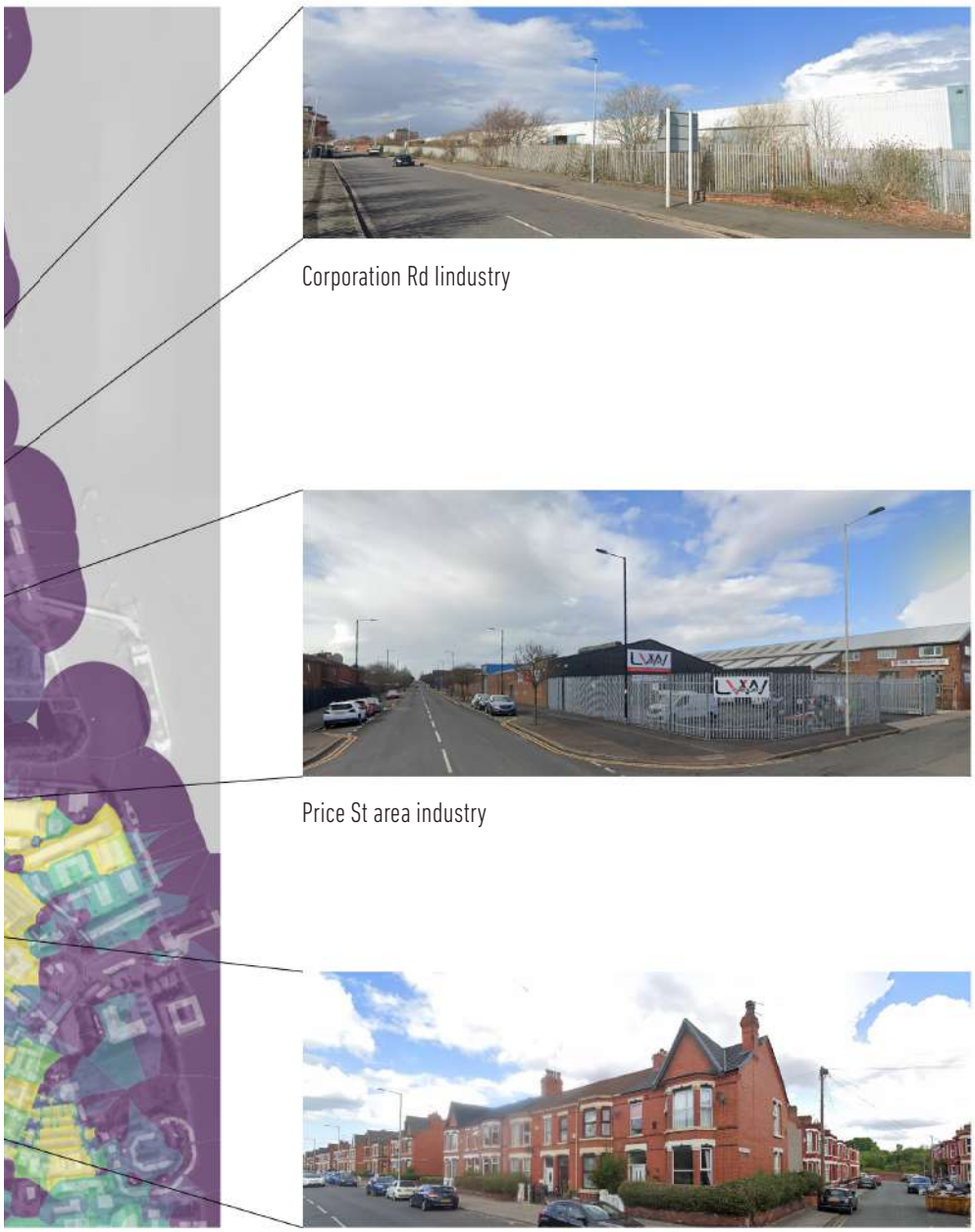


Simpson Diversity Index

In the urban analysis of Wirral Waters, the Simpson Diversity Index is used to measure the variety in land use and architecture. It quantifies the mix of building types, public spaces, and other urban elements, providing a numerical insight into the area's diversity. This metric aids urban planners in assessing and enhancing the balance and vibrancy of the urban landscape, fostering a diverse and inclusive community.

Simpson Diversity Index gradient





Corporation Rd lindustry

Price St area industry

Park Rd blocks

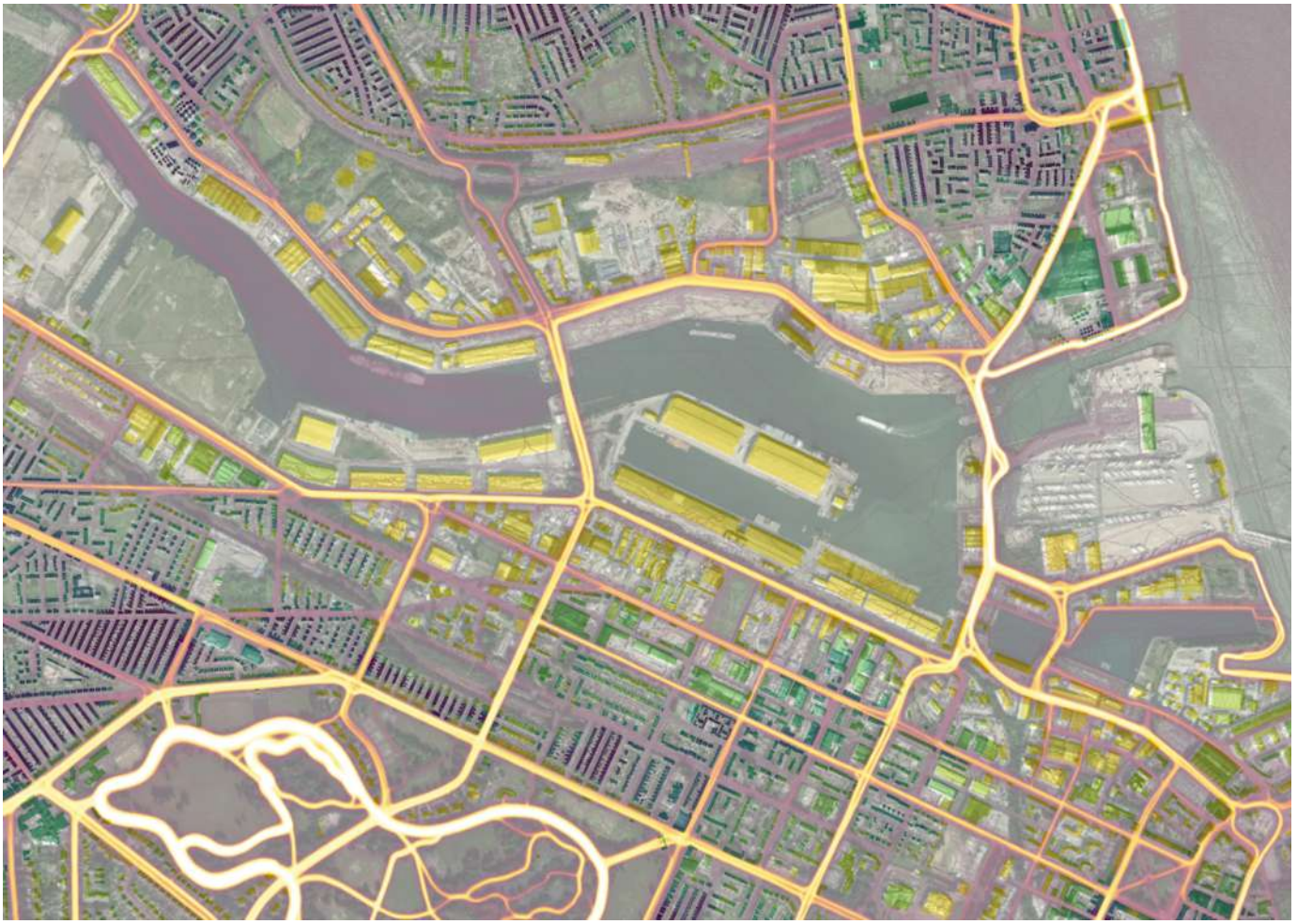
Covered Area Ratio

The Covered Area Ratio (CAR) index, utilized through the Momepy library, is a significant metric in the urban analysis of Wirral Waters. It quantifies the proportion of land covered by buildings, offering a precise measure of urban density and built-up intensity. By analyzing the CAR index, researchers can gauge the spatial character of Wirral Waters, understanding how built structures interact with open spaces. This insight is crucial for evaluating the balance between development and accessibility to open areas, influencing decisions on sustainable urban growth, green space allocation, and infrastructure planning. In essence, the CAR index provides a data-driven foundation for shaping a well-structured, livable urban environment in Wirral Waters.

Gradient

Mean Interbuilding Distance

The Mean Interbuilding Distance metric, analyzed via the Momepy library, is instrumental in assessing Wirral Waters' urban layout. It measures the spacing between buildings, offering insights into urban density, walkability, and community spaces. This data aids planners in optimizing the balance between built structures and open areas, ensuring a harmonious and accessible urban environment.



Walkability within urban density

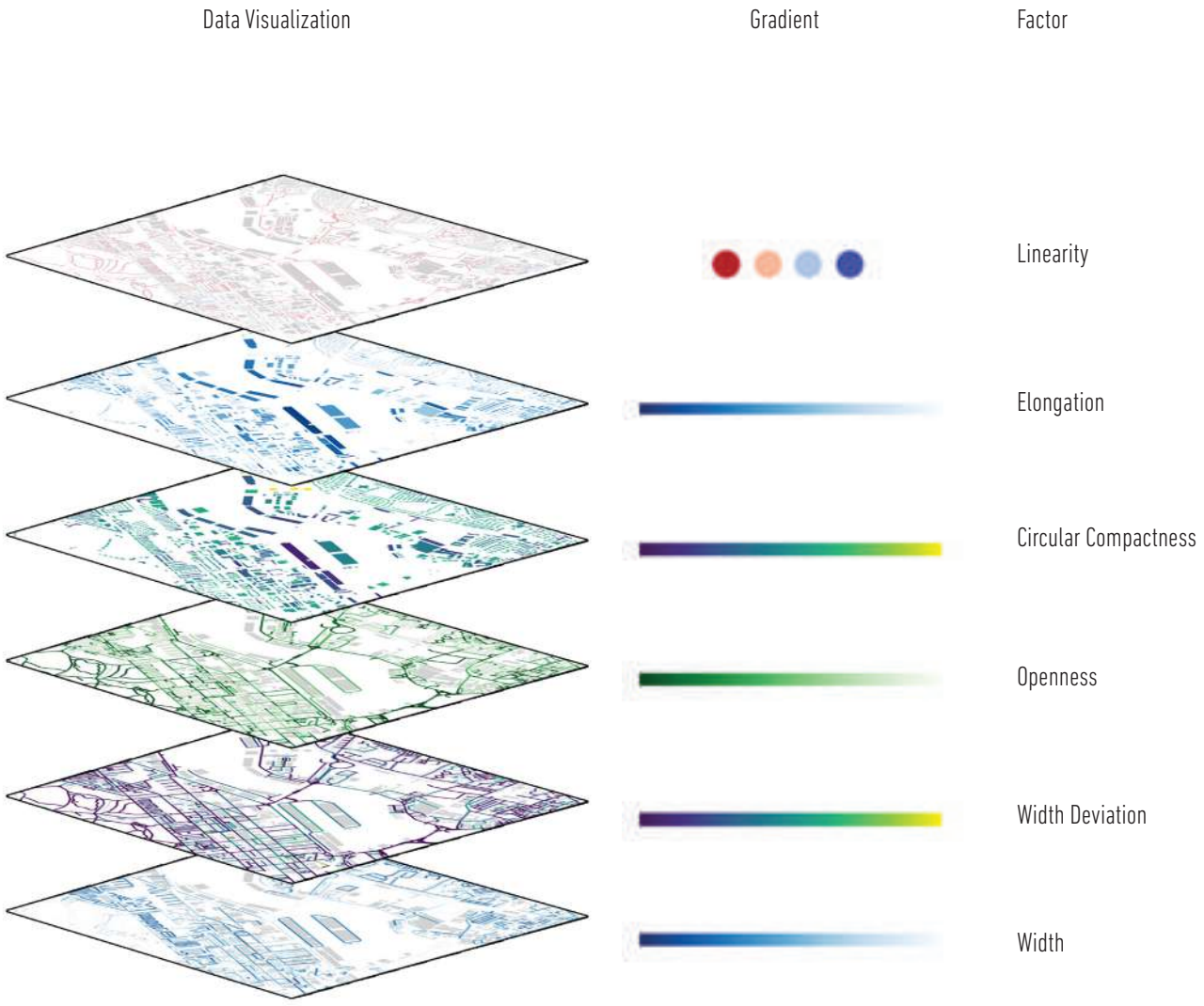
The Mean Interbuilding Distance metric, analyzed with Momepy and aligned with GPS movement data of pedestrians and cyclists, offers vital insights into Wirral Waters' urban structure. This approach reveals how building spacing impacts the flow of foot and bike traffic, guiding urban design to enhance walkability and cyclability. It ensures that the spatial layout supports natural movement, promoting an accessible and intuitive urban environment.

Width

Width deviation

Openness

Linearity



Composite diagram

The composite diagram for Wirral Waters' urban mobility analysis merges key spatial metrics, offering a nuanced view of the area's layout. It assesses linearity and elongation to depict the urban stretch, while circular compactness gauges clustering and distribution of spaces. Openness is measured to understand the interplay between built structures and open areas. Width deviation and maps are included to detail street and pathway dimensions, impacting navigation and mobility. This integrated approach provides a comprehensive understanding of the urban form and its influence on movement within Wirral Waters.

Existing

Proposed

Existing

Proposed

Conclusions

1. 15 minutes city gaps

2. Sustainable smart travel hubs at arival points

3. Street network improvements for pedestrian and cyclists

4, Access to waterfront and water mobility

5. Street network development to improve connectedness

6. Urban density control for freedom of movement

7. Data driven and simulation based design decisions.

R6

Wirral

substrata compounds

and geology stories

Reinis Salins

Manchester Metropolitan University

RISEBA FAD Faculty of Architecture and Design

/ Wirral peninsula geological survey

/ geology storys

/ tunneling triumphs

/ geology for better future

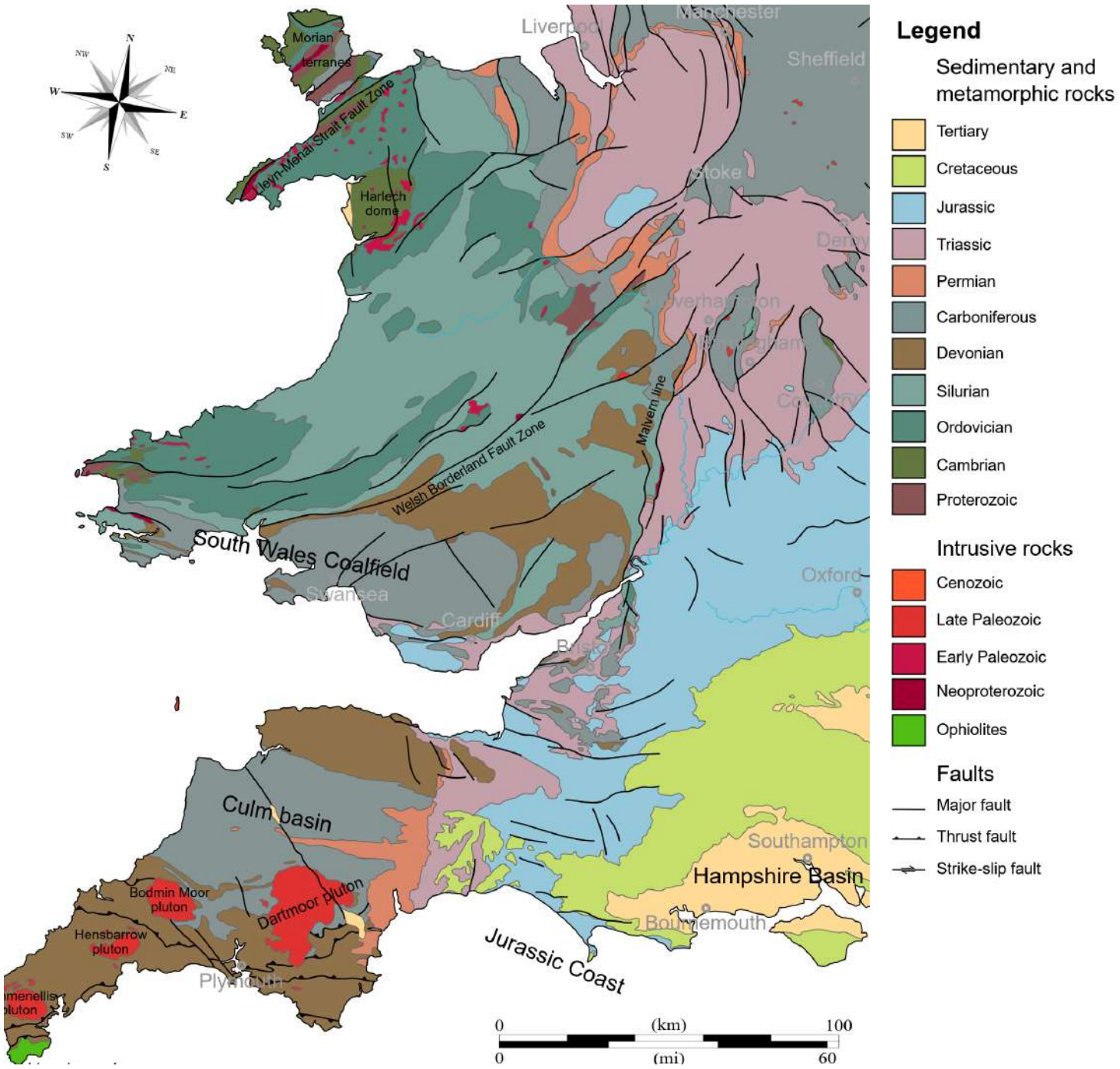
/ Learn to read soil

/ Explore with new knowledge

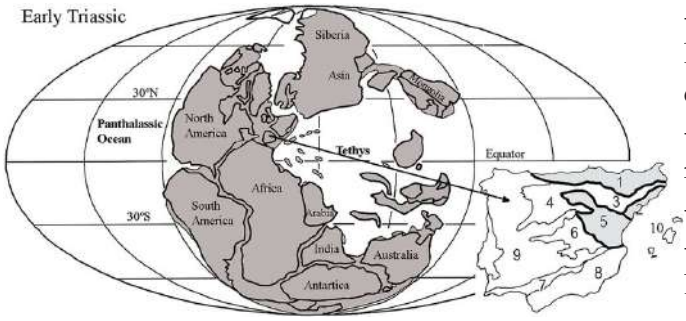
/ man vs. ground

/ Conclude for a better future

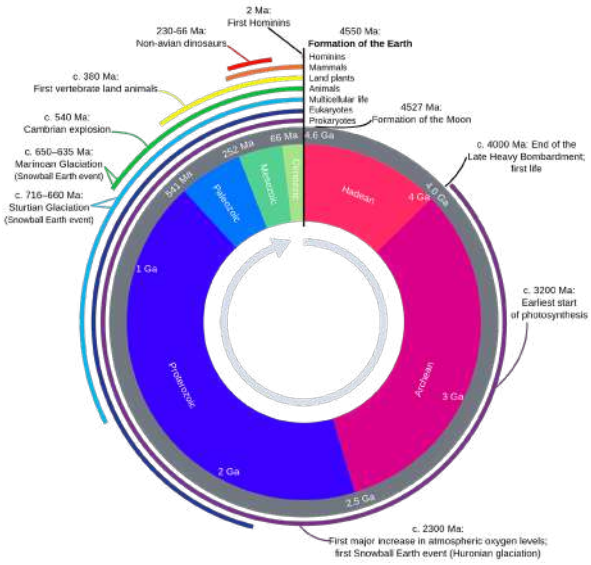
Wirral peninsula geological survey
Geological time map



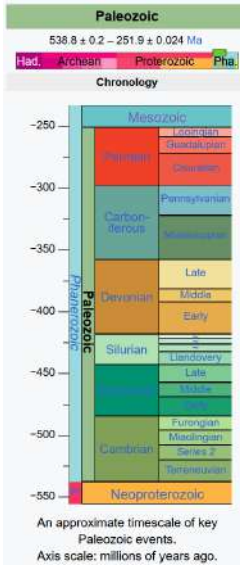
Triassic Period



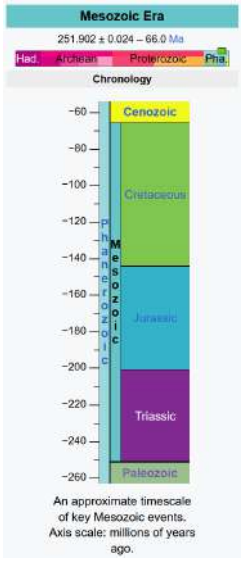
- Lasted from about 252 to 201 million years ago. Began the Mesozoic Era after the Permian mass extinction.
- Saw the rise of dinosaurs, mammals, and large reptiles.
- Characterized by significant geological changes.
- Featured the formation and beginning breakup of Pangea supercontinent.



representation of the geologic time scale represented as a clock.

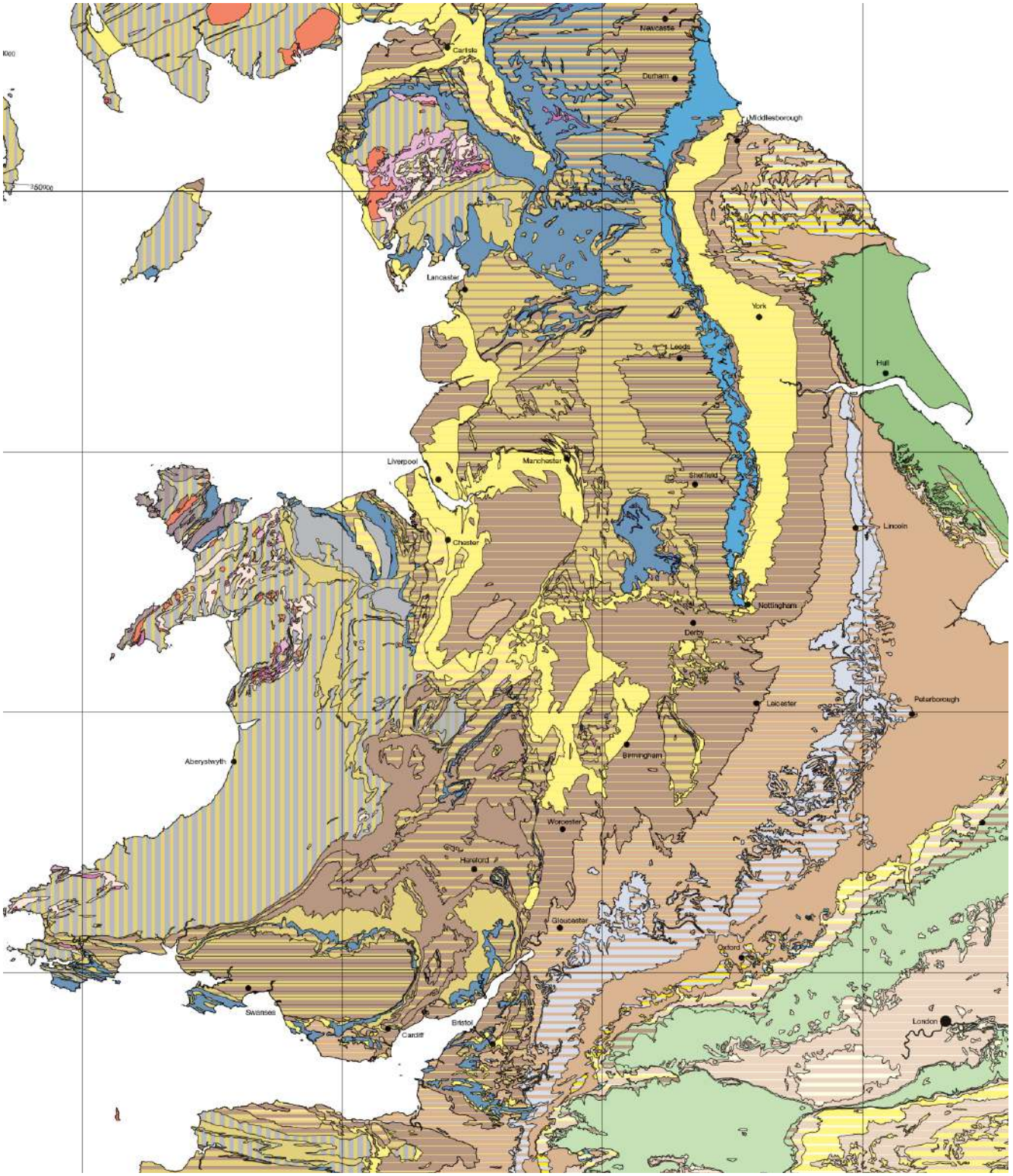


The Paleozoic or Palaeozoic) Era is the first of three geological eras of the Phanerozoic Eon. Beginning 538.8 million years ago



The Mesozoic Era[3] is the second-to-last era of Earth's geological history, lasting from about 252 to 66 million years ago,

Bedrock map


Carlisle
Newcastle
Durham
Middlesbrough
Lancaster
York
Leeds
Hull
Liverpool
Manchester
Sheffield
Chester
Lincoln
Nottingham
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Leicester
Peterborough
Aberystwyth
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Hereford
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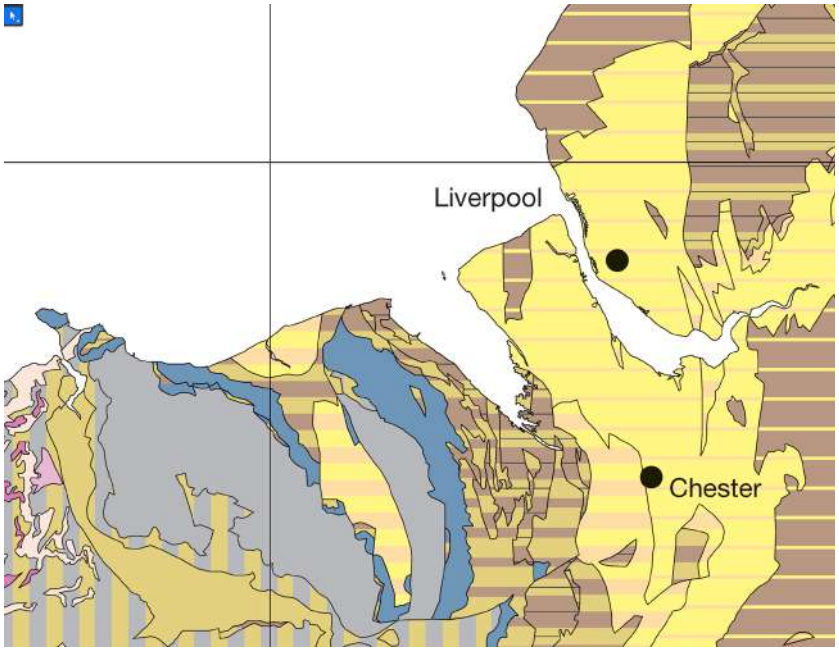
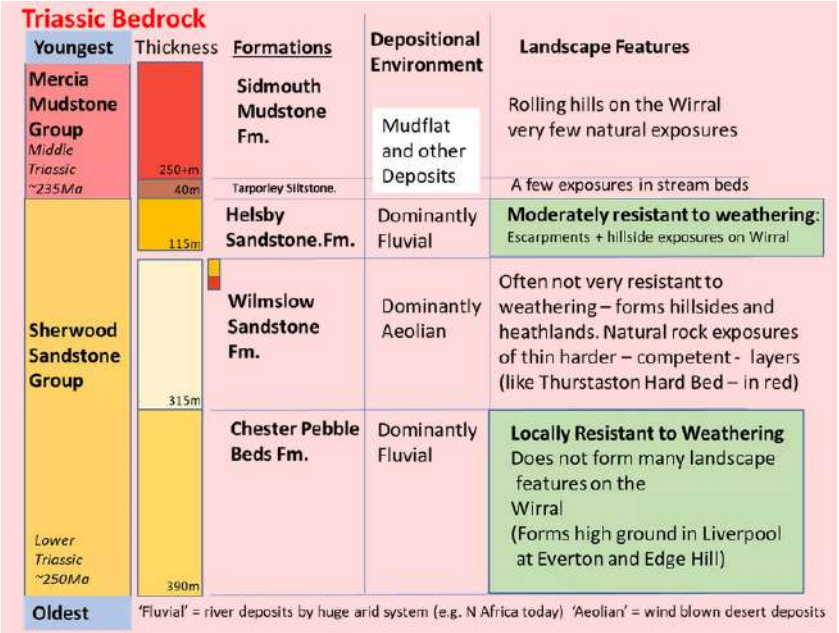
Oxford
Swansea
Cardiff
Bristol
London



LITHOLOGY	DESCRIPTION (After BS5930:1999)
Coarse Soil	Medium dense to very dense fine to coarse-grained SAND sometimes with medium dense to very dense GRAVEL with some cobbles. Sandy clays and silts, sometimes laminated, occur locally. High to very high permeability; flow is through matrix. Includes calcareous types.
Fine Soil	Firm to very stiff sometimes sandy CLAY or SILT. Effectively impermeable to low permeability; flow dominantly through fissures. Includes calcareous types. Considered to be overconsolidated.
Very Stiff Fine Soil/Very Weak Mudstone	Very stiff CLAY to very weak MUDSTONE. Weathers to fissured soft to stiff clay. Generally very low to low permeability; flow dominantly through discontinuities, most notably in the fissured top few metres. Includes very weak SILTSTONE and calcareous types. Considered to be overconsolidated.
Mudstone	Very weak to medium strong usually fissured MUDSTONE. Weathers to a firm to stiff silty clay generally within 2-6 m of ground surface; highly weathered mudstone clasts in a silt/clay matrix may occur to depths of 10-15 m. Generally low permeability, higher permeability in fissured near-surface material; flow dominantly through discontinuities. Includes SILTSTONE and calcareous types.
Sandstone	Very weak to medium strong medium to widely jointed thinly to thickly bedded fine to coarse-grained SANDSTONE; may contain beds of mudstone and siltstone. Weathers to loose sand or clayey sand. Highly weathered rock may be present to depths in excess of 10 m, e.g. in the vicinity of faults. Medium to very high permeability; flow is through matrix and discontinuities. Includes calcareous types.
Strong Sandstone	Medium strong to extremely strong medium to widely jointed thinly to thickly bedded fine to coarse-grained SANDSTONE; may contain slate or mudstone and siltstone beds. Weathers to a loose to very dense sand, gravel or silty/clayey sand. Low to high permeability; flow is through matrix and discontinuities. Includes GREYWACKES.
Conglomerate/ Breccia	Very weak to very strong coarse-grained CONGLOMERATE or BRECCIA, comprising rounded or angular clasts of gravel-size or larger in a finer indurated or cemented matrix. May weather to silty, sandy gravels, cobbles or boulders depending on inherent clast size. Permeabilities are variable but may be low to very high; flow through matrix and discontinuities.
Oolitic Limestone	Very weak to strong thickly to thinly bedded shelly fine to medium-grained OOLITIC LIMESTONE; may contain sandstone or very stiff clay/very weak mudstone beds. Weathers to gravelly, calcareous sand. Low to very high permeability; flow mainly through discontinuities but also through matrix.
Limestone	Very weak to strong closely to widely jointed thinly to very thickly bedded fine-grained crystalline LIMESTONE. Topmost 0.5-1.5 m often weathered to calcareous silty clay with gravel. Zones of highly weathered rock may extend to depths in excess of 10 m below ground surface; may have variable rockhead levels and contain dissolution cavities. Generally moderate to very high permeability; flow is through discontinuities and matrix. Includes DOLOMITIC LIMESTONE and DOLOSTONE, sometimes with dolomitic mudstone.
Strong Limestone	Strong to extremely strong closely to widely jointed thinly to very thickly bedded fine-grained crystalline LIMESTONE; may contain a little chert at some levels. Weathers to calcareous gravel; may have variable rockhead levels and contain dissolution cavities such as sink holes and caves. Generally very high permeability; flow is through discontinuities.

Sandstone, as a type of bedrock, can be a good foundation for building in certain conditions. It's typically a stable, solid rock that provides good bearing capacity for structures. However, its suitability also depends on factors like the density of the sandstone, its composition, and the presence of any fractures or weathering. Highly weathered or fractured sandstone might not be as reliable

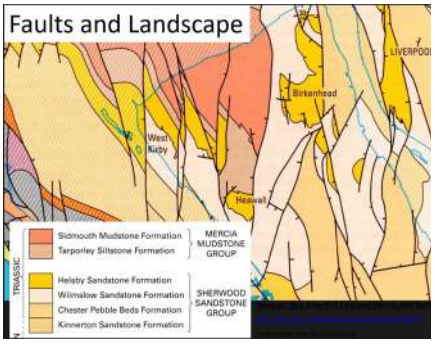


The Triassic Period is represented by red mudstones and sandstones that underlie virtually the entire area, with the sandstones forming the higher ground at the northern end of the Wirral.

NOT all the Triassic Sandstone is the Same!

The Triassic sedimentary rocks on the Wirral have a number of different Formations (thick layers) which have very different resistance to weathering and erosion - and give rise to our varied countryside

Bedrock map



Deep seated fault lines controls the distribution of 'harder' - more resistant sandstones across the Wirral.

Note how many of our 'beauty spot' escarpments including Bidston Hill, Grange Hill in West Kirby, and Heswall Hills are produced where the relatively soft Wilmslow Sandstone is overlain by the more resistant Helsby Sandstone Formation.
Faulting brings the same unit geological contact to the surface.

This detail of a teaching diagram in Buckland's collection shows the geology of the Liverpool area. Originally drawn by John Cunningham, a local architect, Buckland commissioned an enlarged copy almost 4m long from the Oxford artist John Fisher in the early 1840s

Sidmouth Mudstone Formation - Mudstone. Sedimentary bedrock formed between 250 and 228.4 million years ago during the Triassic period.

Wilmslow Sandstone Formation - Sandstone. Sedimentary bedrock formed between 252.2 and 247.1 million years ago during the Triassic period.

Helsby Sandstone Formation - Sandstone. Sedimentary bedrock formed between 247.1 and 241.5 million years ago during the Triassic period.

Tarporley Siltstone Formation - Siltstone, mudstone and sandstone. Sedimentary bedrock formed between 250 and 241.5 million years ago during the Triassic period.

Chester Formation - Sandstone, pebbly (gravelly). Sedimentary bedrock formed between 250 and 247.1 million years ago during the Triassic period

Superficial deposits map

Superficial deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 2.6 million years from the present.

Geology is dominated by glacial till overlying Triassic red mudstones and sandstones, with sandstone ridges and outcrops.

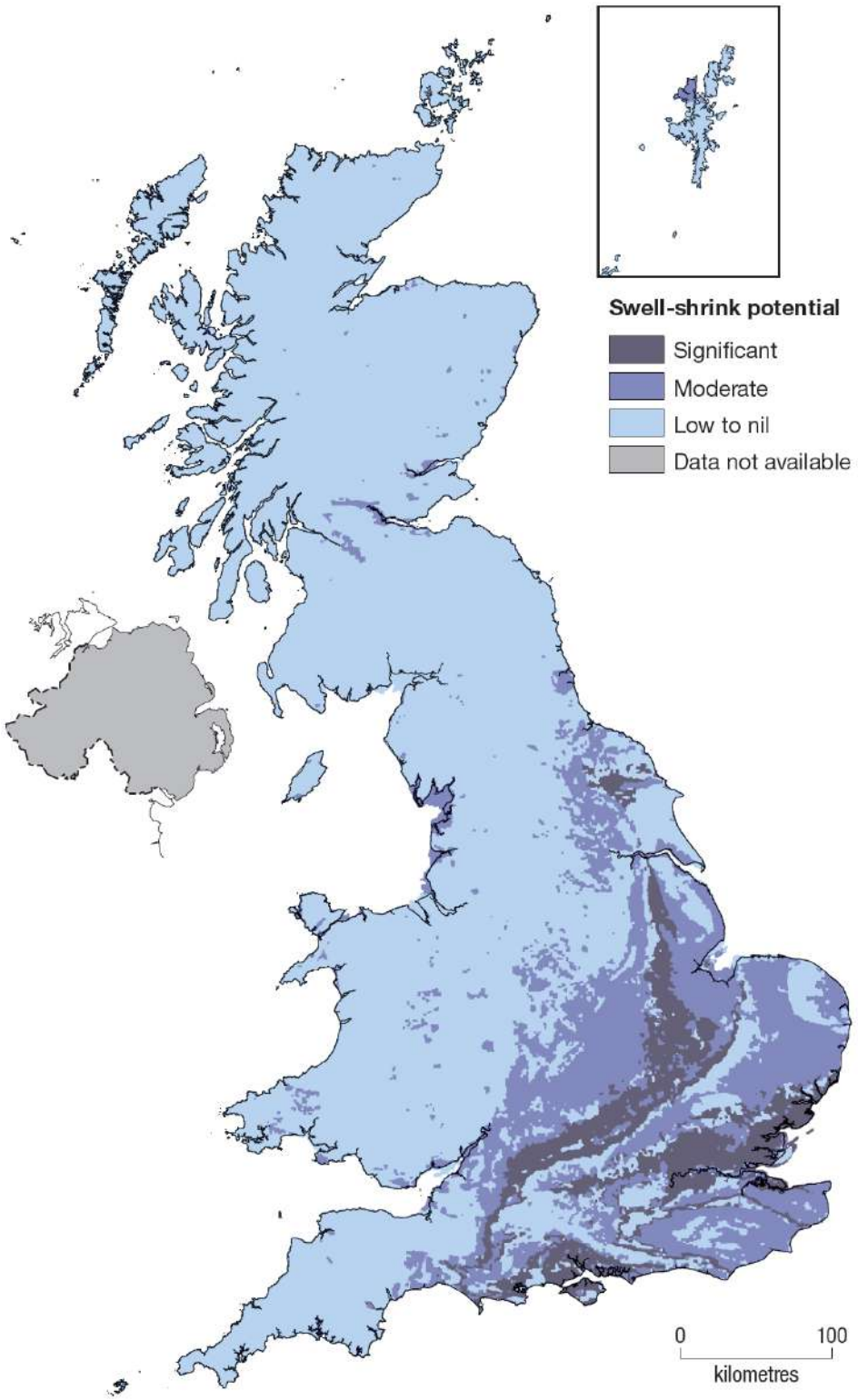
Blown Sand - Sand. Sedimentary superficial deposit formed between 2.588 million years ago and the present during the Quaternary period.

Tidal Flat Deposits - Clay, silt and sand. Sedimentary superficial deposit formed between 11.8 thousand years ago and the present during the Quaternary period.

Till, Devensian - Clay, sandy, gravelly, cobbly. Sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period.

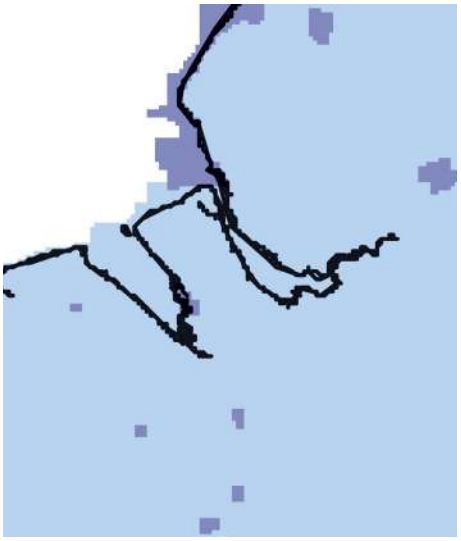
The main deposit of Quaternary age is till, which formed in and beneath glaciers and ice sheets. During the last glacial advance some 20,000 years ago, ice invaded from the Irish Sea area and deposited till, sands and gravels over much of the Red sandstones outcrop in many parts of the Wirral, including at Hilbre Island at the mouth of the Dee Estuary. Merseyside area. Also associated with the glacial advance are deposits of fine, wind-transported silt known as loess.

SWELLING AND SHRINKING CLAY

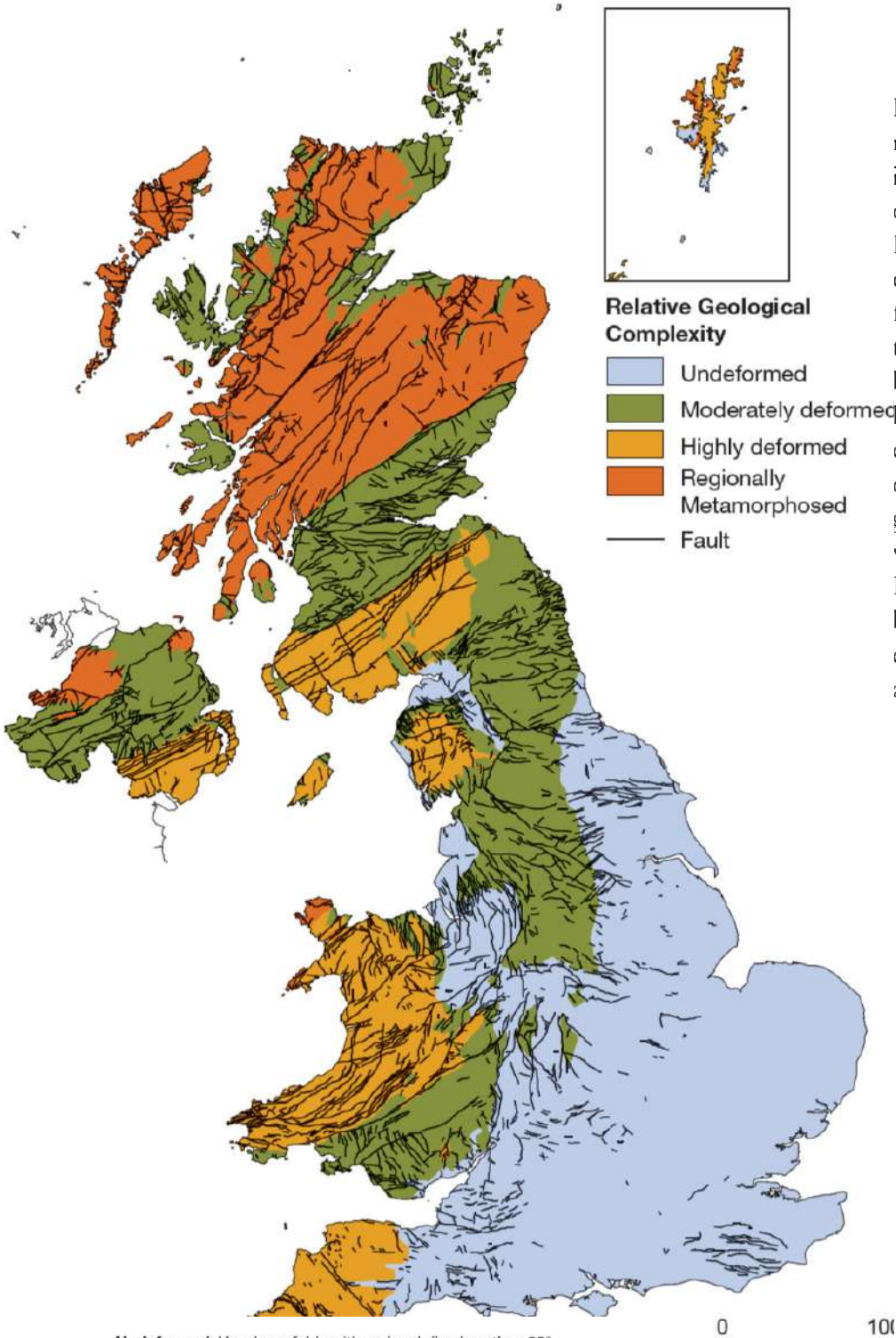


Based upon BGS GeoSure Shrink-Swell dataset (2011). Further information can be found on the GeoSure webpages: http://www.bgs.ac.uk/products/geosure/home.html

Swelling and shrinking clay" refers to a type of soil that significantly changes volume with moisture content. When these clays absorb water, they expand or swell, and when they dry out, they shrink. This property can cause ground movement, which is a major concern in construction and civil engineering. Structures built on such clay can experience damage due to the soil's volume changes, leading to problems like cracking in building foundations, roads, and pavements. Understanding the presence and behavior of swelling and shrinking clays is crucial for safe and sustainable construction practices

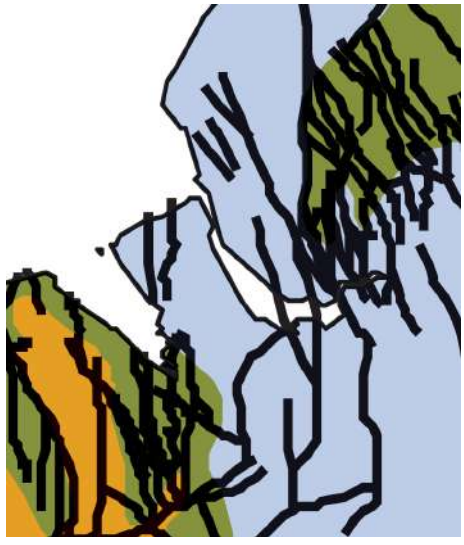


BEDROCK STRUCTURAL COMPLEXITY



Undeformed: Very large folds with regional dips less than 20°.
Moderately Deformed: Large scale folds with wavelengths measured in kilometres, bedding may dip at more than 20°. Numerous faults do not affect continuity.
Highly Deformed: Folds small scale, amplitudes less than 30 metres. May be intruded by granites.
Regionally Metamorphosed: Often intensely folded on both large and small scales. There may be more than one cleavage, intruded by granites.

Bedrock structural complexity" refers to the variation and intricacy in the formation and arrangement of bedrock layers beneath the Earth's surface. This complexity can include features such as faults, folds, fractures, and varying rock types. The structural complexity of bedrock is a crucial factor in fields like geology, seismology, and civil engineering, as it affects the stability of the ground, the behavior of groundwater, and the risks associated with natural hazards like earthquakes. In construction, understanding the bedrock's structural complexity is essential for designing foundations and other underground structures.



TECTONIC MAP OF GREAT BRITAIN AND NORTHERN IRELAND

BASED ON THE WORK OF THE GEOLOGICAL SURVEY AND OTHER PUBLISHED DATA

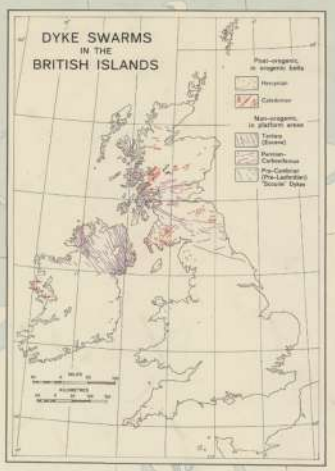
1st. EDITION 1966

SIR JAMES STUBBLEFIELD, O.Sc., F.R.S.
DIRECTOR

SCALE 1:1584000

MILES

KILOMETRES



ATLANTIC OCEAN

NORTH SEA

IRISH SEA

ENGLISH CHANNEL

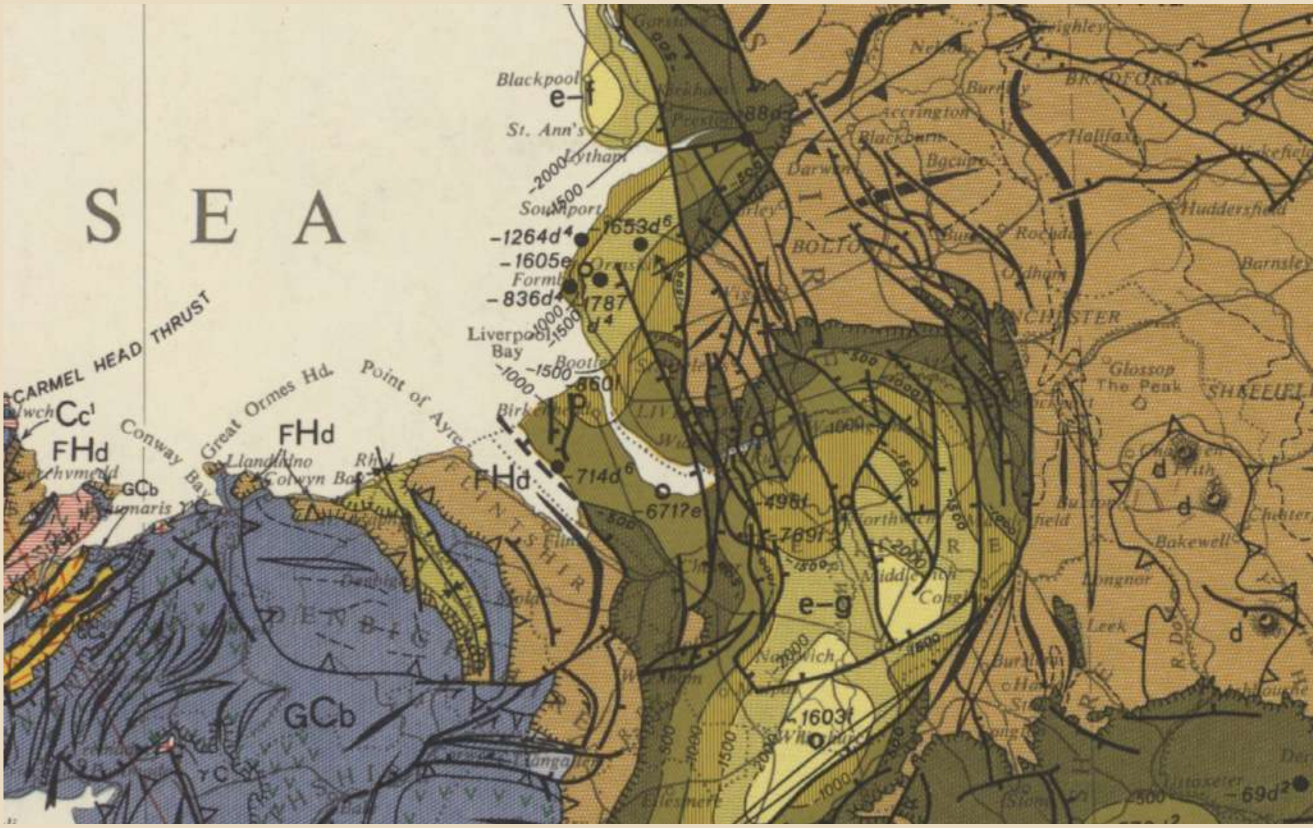
ST GEORGE'S CHANNEL

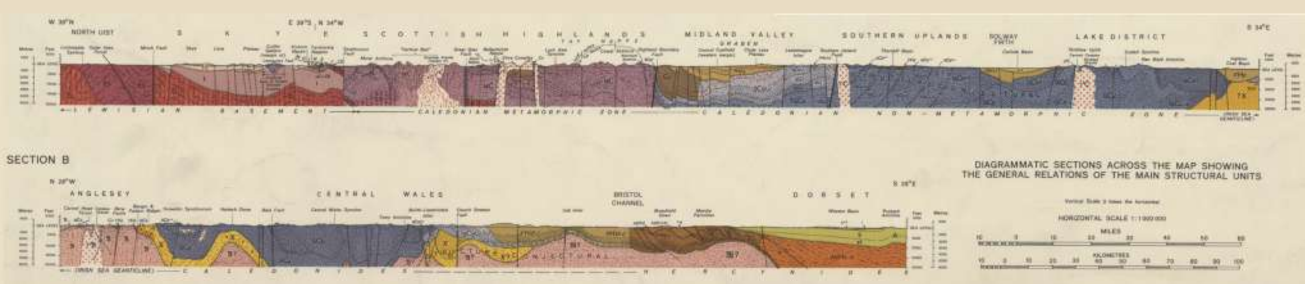
CHANNEL ISLANDS

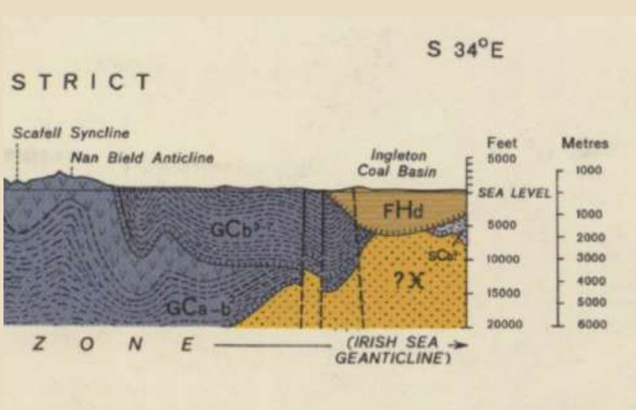
INDEX

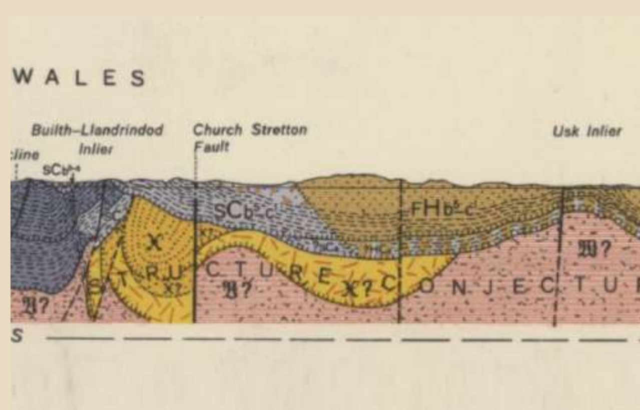
1st Edition 1966 compiled by F. W. Dunning, D.Sc., Sir James Stubblefield, D.Sc., F.R.S., Director, Institute of Geological Sciences incorporating the Geological Survey of Great Britain, the Museum of Practical Geology and the Overseas Geological Surveys in London

Made and published by the Director General of the Ordnance Survey, Chessington, Surrey, 1966, for the Institute of Geological Sciences

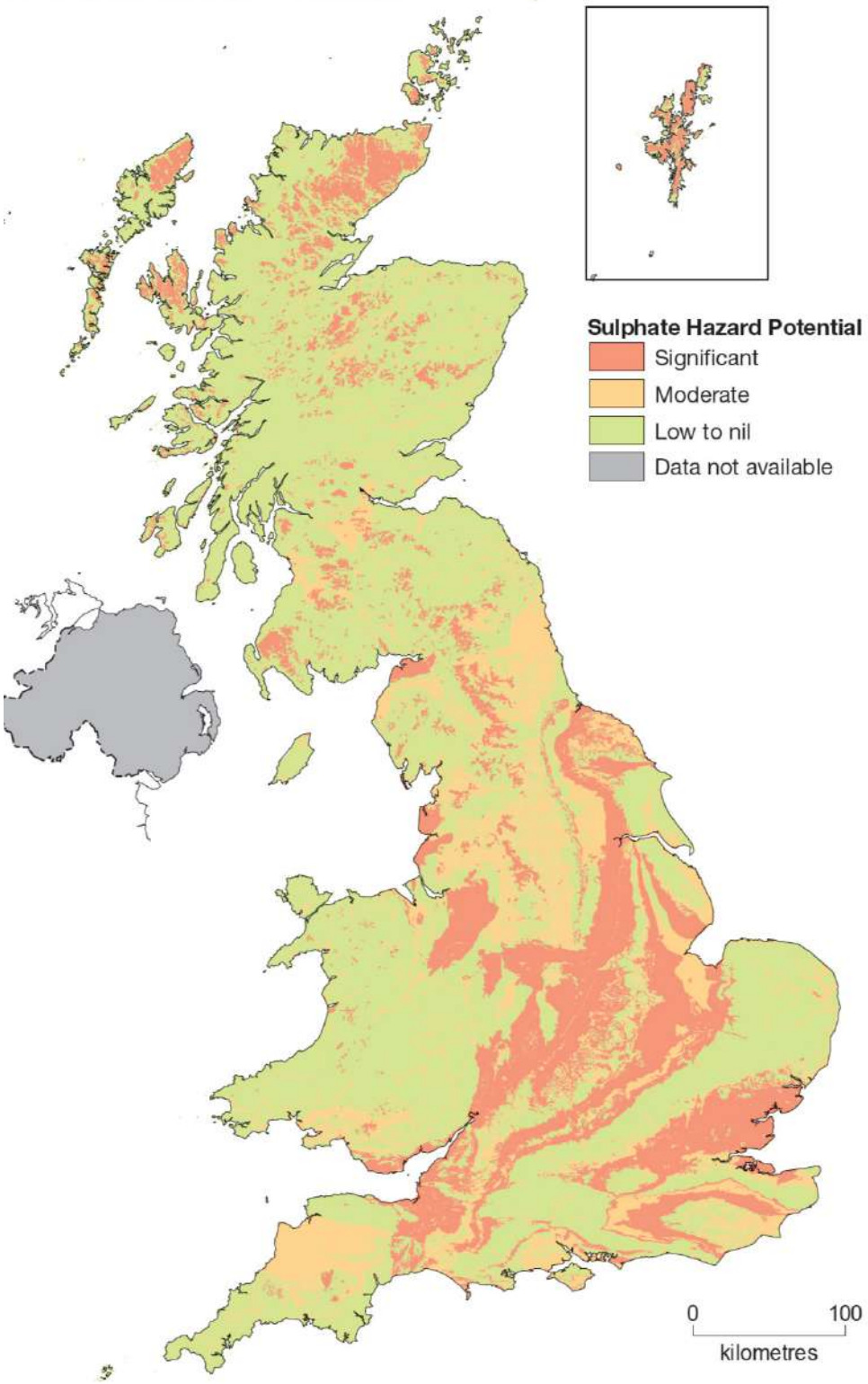

SEA
CARMEL HEAD THRUST
Great Ormes Hd.
Point of Ayre
Conway Bay
Liverpool Bay
Blackpool
St. Ann's
Southport
-1264d4
-1605e
-836d4
FHd
GCb
e-g
d
-714d6
-6717e
-69d2


SCOTTISH HIGHLANDS
MIDLAND VALLEY
SOUTHERN UPLANDS
LAKE DISTRICT
SECTION B
ANGLESEY
CENTRAL WALES
BRISTOL CHANNEL
DORSET
DIAGRAMMATIC SECTIONS ACROSS THE MAP SHOWING THE GENERAL RELATIONS OF THE MAIN STRUCTURAL UNITS


S 34°E
STRICT
Scafell Syncline
Nan Bield Anticline
Ingleton Coal Basin
Feet
Metres
5000
SEA LEVEL
1000
FHd
GCb
?X
GCa-b
5000
10000
15000
20000
2000
3000
4000
5000
6000
Z O N E
(IRISH SEA GEANTICLINE)

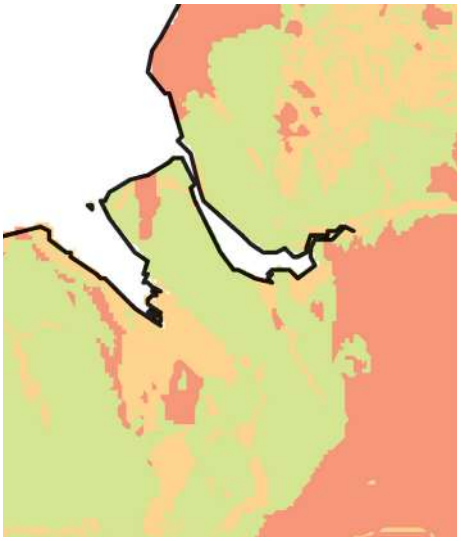

WALES
Builth-Llandrindod Inlier
Church Stretton Fault
Usk Inlier
SCb-c
FHb-c
X
C T U R E
O N J E C T U R
S

SULPHATE HAZARD POTENTIAL

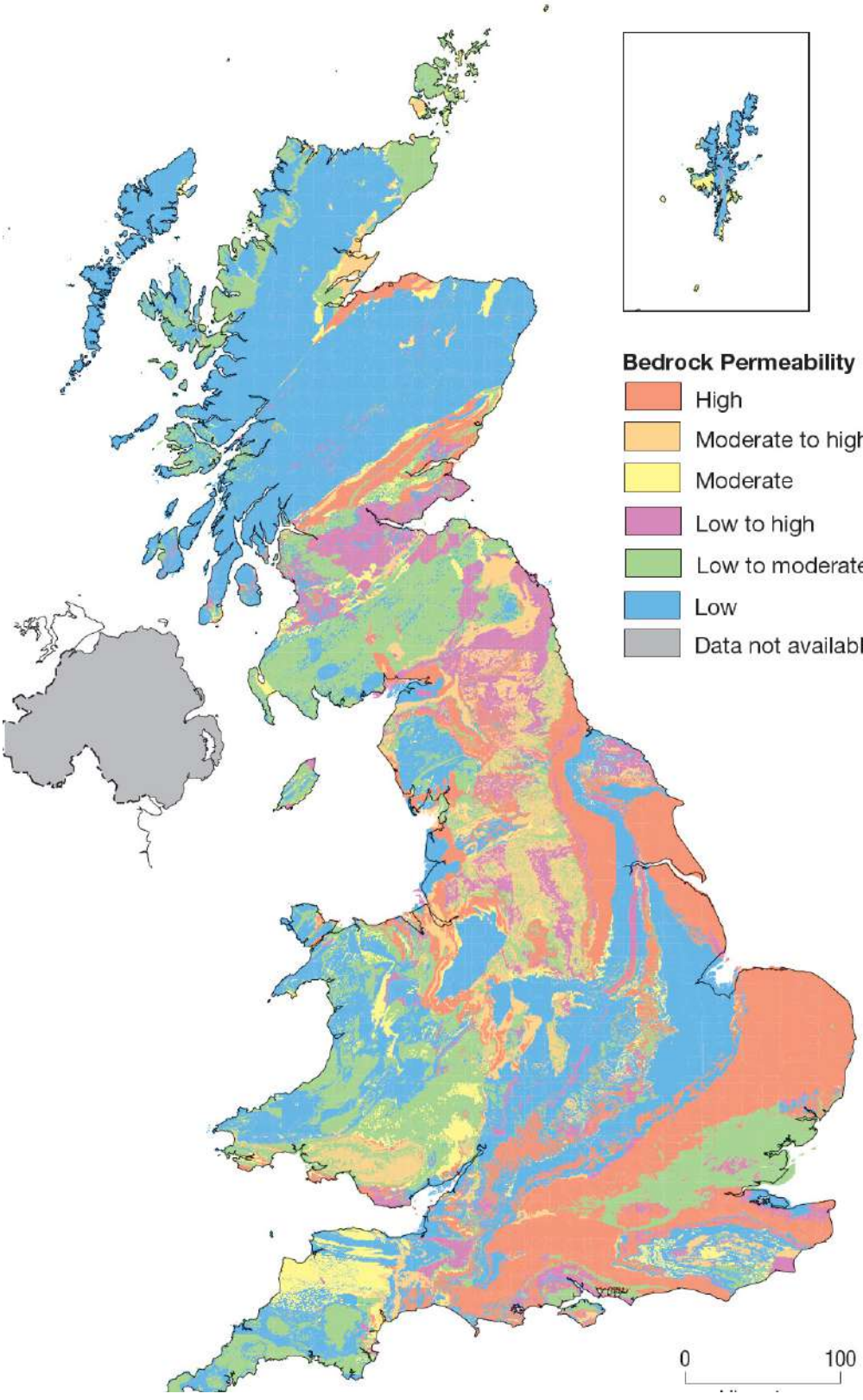


Sulfates in construction can cause concrete damage like expansion and cracking, especially in foundations and underground structures. Assessing soil sulfate levels is essential to prevent such damage. Sulfates, found in water, soil, and air, come from natural processes and human activities. Managing their presence is critical to maintaining structural integrity in high-sulfate areas.

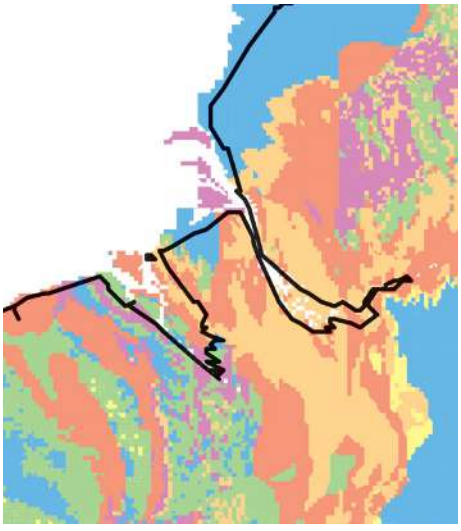
Sulfates, containing the SO4^2- ion, occur naturally in water, soil, and air from various sources like mineral oxidation and industrial activities. In construction, their reaction with concrete can cause structural damage. It's crucial to check for sulfates in construction areas to prevent such issues and maintain structural integrity.



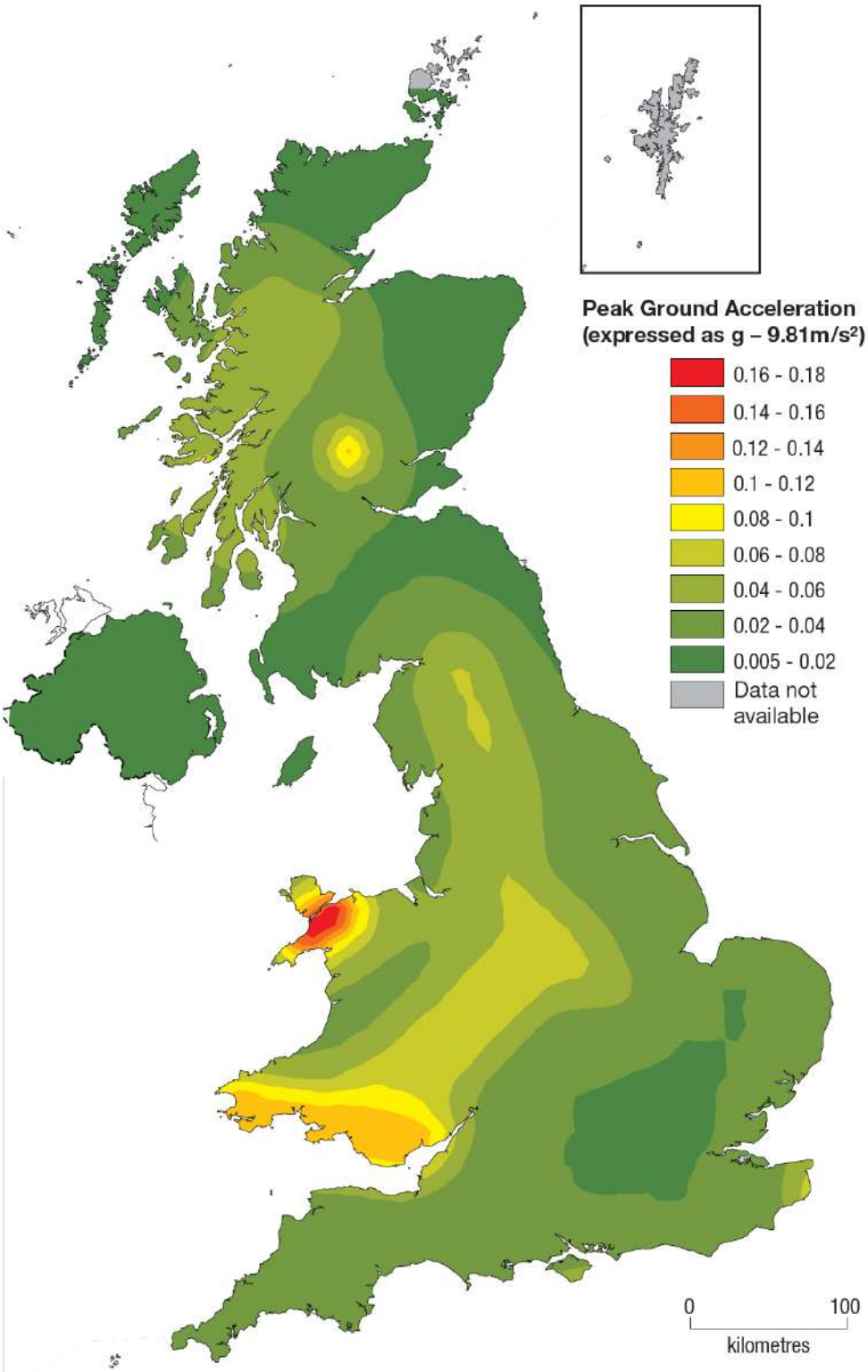
RELATIVE BEDROCK PERMEABILITY



"Relative bedrock permeability" refers to the measure of how easily water or other fluids can pass through the bedrock due to its natural porosity and fracture systems. It's a critical factor in understanding groundwater flow, the potential for soil contamination, and the stability of foundations for construction. High permeability implies that water can move easily through the bedrock, which can be important for groundwater recharge but also poses challenges for construction stability and contamination risks. Conversely, low permeability indicates that the bedrock is more impervious, limiting fluid movement, which affects water availability but can provide a more stable construction base.

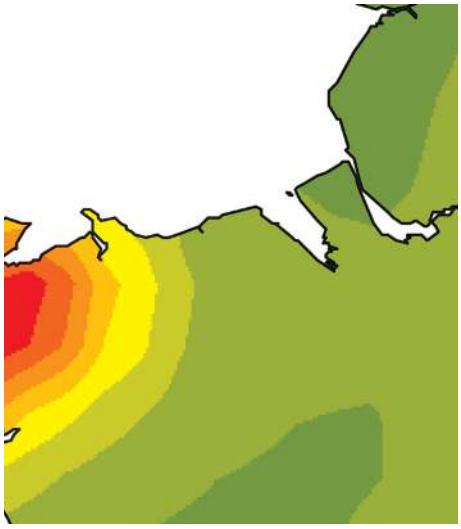


UK SEISMIC HAZARD (2,500 year return period)

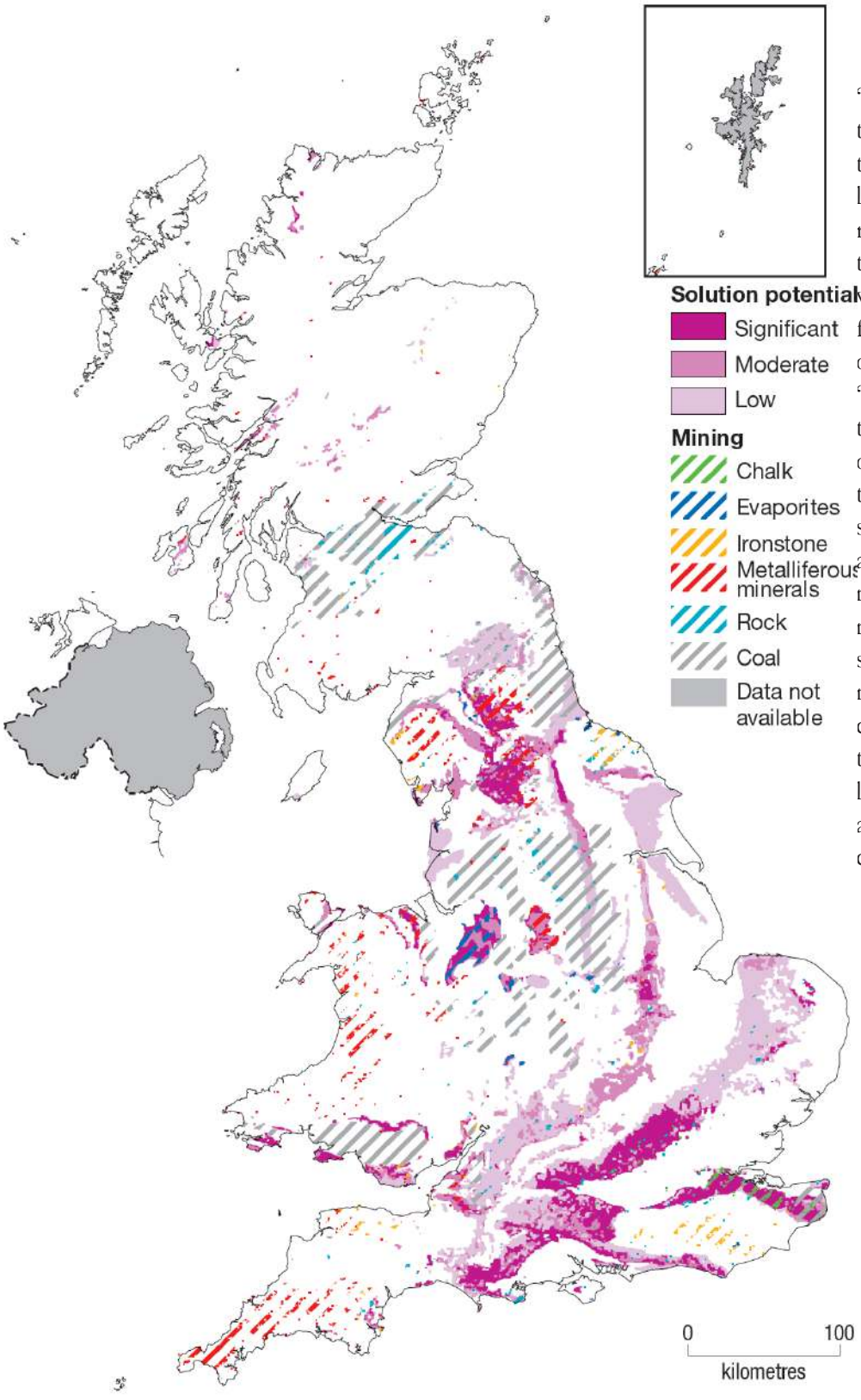


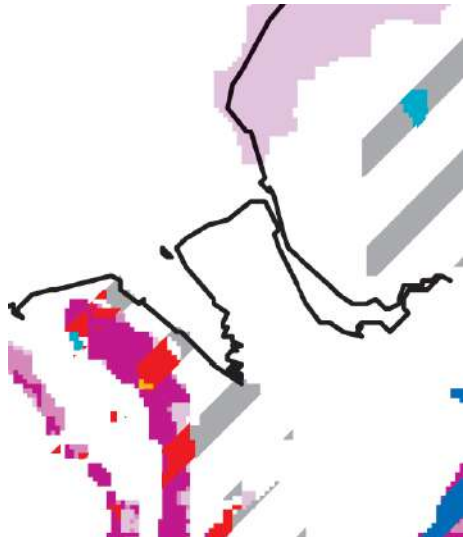
From Musson, R.M.W. and Sargeant, S.L. 2007. *Eurocode 8 seismic hazard zoning maps for the UK*, British Geological Survey Technical Report, CR/07/125. 70pp.

For the UK, which is not known for high seismic activity, these values suggest a low to moderate seismic hazard. Buildings and structures in areas with this level of seismic hazard are typically designed to withstand such levels of ground shaking without significant damage.



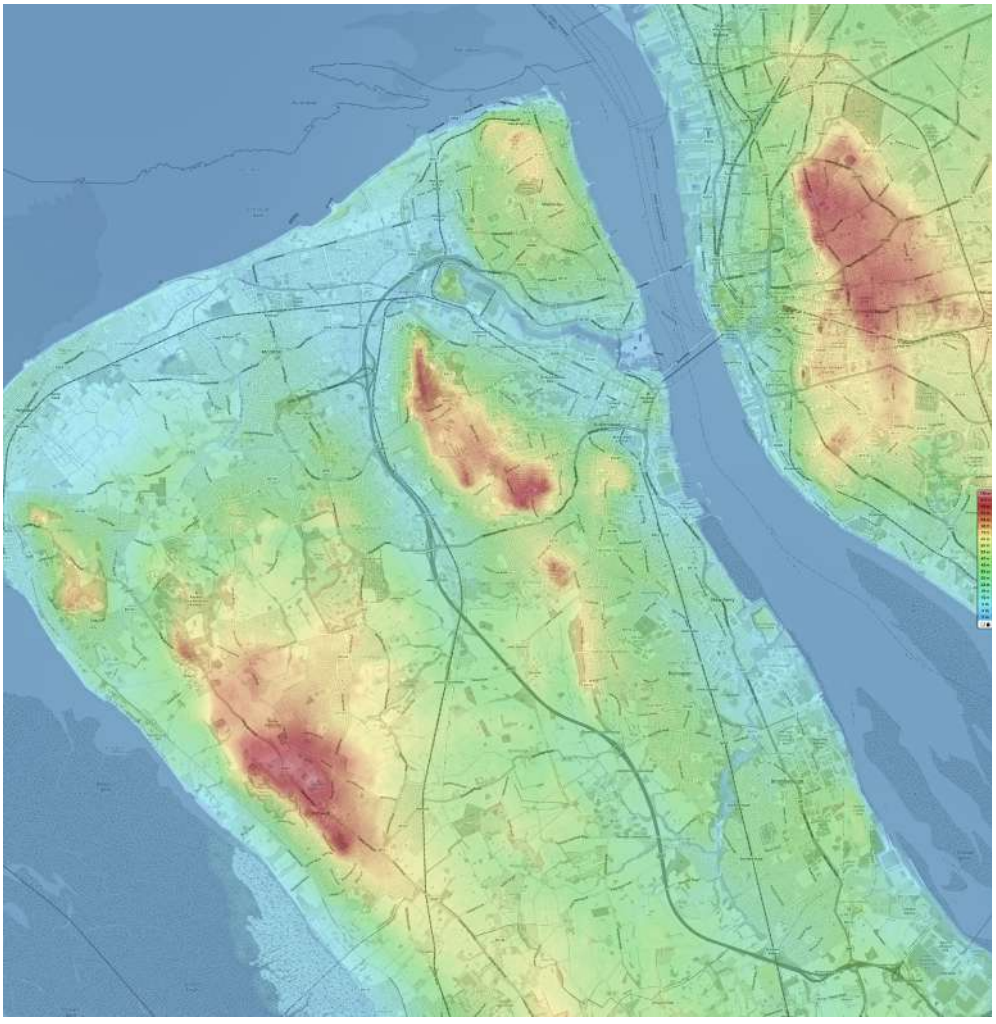
SOLUBLE ROCKS AND UNDERGROUND MINING





"Soluble rocks" are types of rocks that can dissolve in water over time. Common examples include limestone, gypsum, and salt. These rocks are particularly susceptible to a process known as chemical weathering, which can lead to the formation of caves, sinkholes, and other karst features.

"Underground mining" refers to the method of extracting minerals or other geological materials from the earth through mining tunnels or shafts beneath the earth's surface, as opposed to open-pit or surface mining. This method is used for materials that lie deep below the surface or where surface mining is not feasible. Underground mining can be more complex and hazardous than surface mining due to factors like poor ventilation, confined spaces, and the potential for rock falls or collapses.



Surface and Underground Landforms:

The peninsula features a low-lying but gently rolling platform formed by glacial till overlying Triassic sandstone

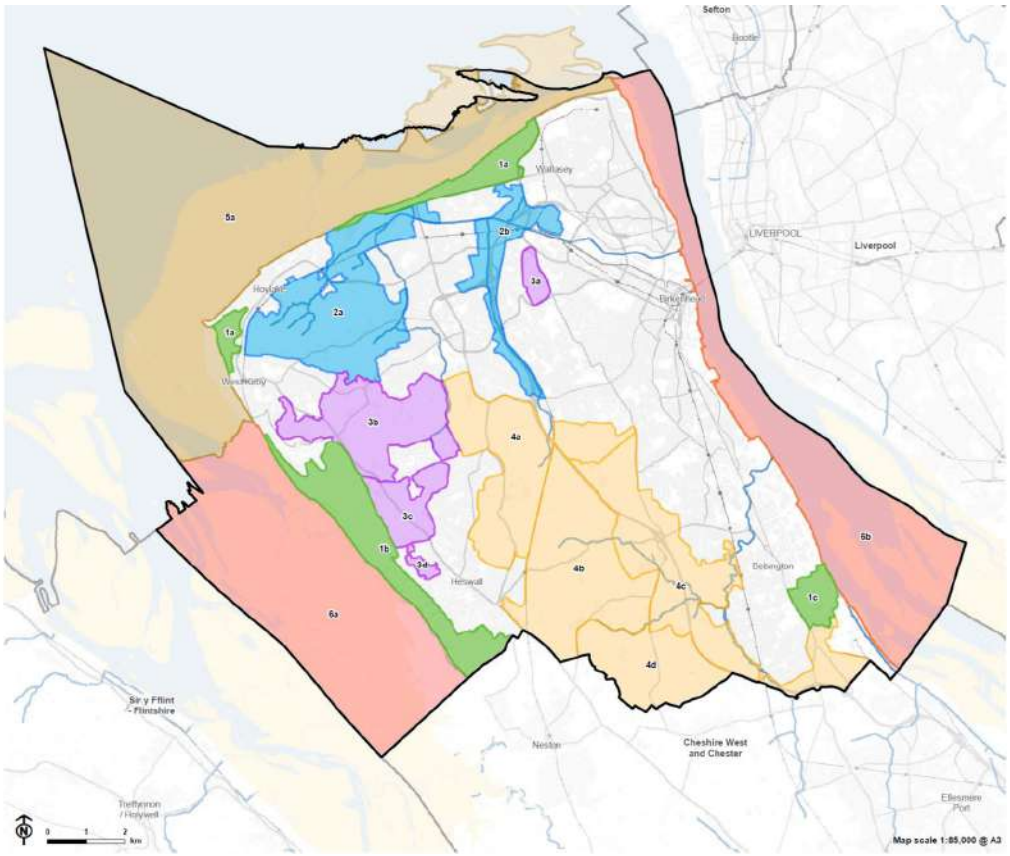
Glacial till, a legacy of the last ice age, covers much of the Wirral, with wind-blown sands along the northern coastal margin

Key landforms include reclaimed tidal flat deposits, a buried bedrock channel known as the Birket, and low cliffs of Kinnerton Sandstone forming a relict shoreline

.

The Deva Spillway, a significant glacial drainage channel, cuts across the peninsula's base, playing a crucial role in the region's deglaciation in post-glacial times

landscape character areas



Wirral Borough boundary

Landscape character areas

1: Coastal / Estuarine Edge
- 1a: North Wirral Coastal Edge
- 1b: Dee Estuarine Edge
- 1c: Eastham Estuarine Edge

2: River Floodplains
- 2a: The Birket River Floodplain
- 2b: The Fender River Floodplain

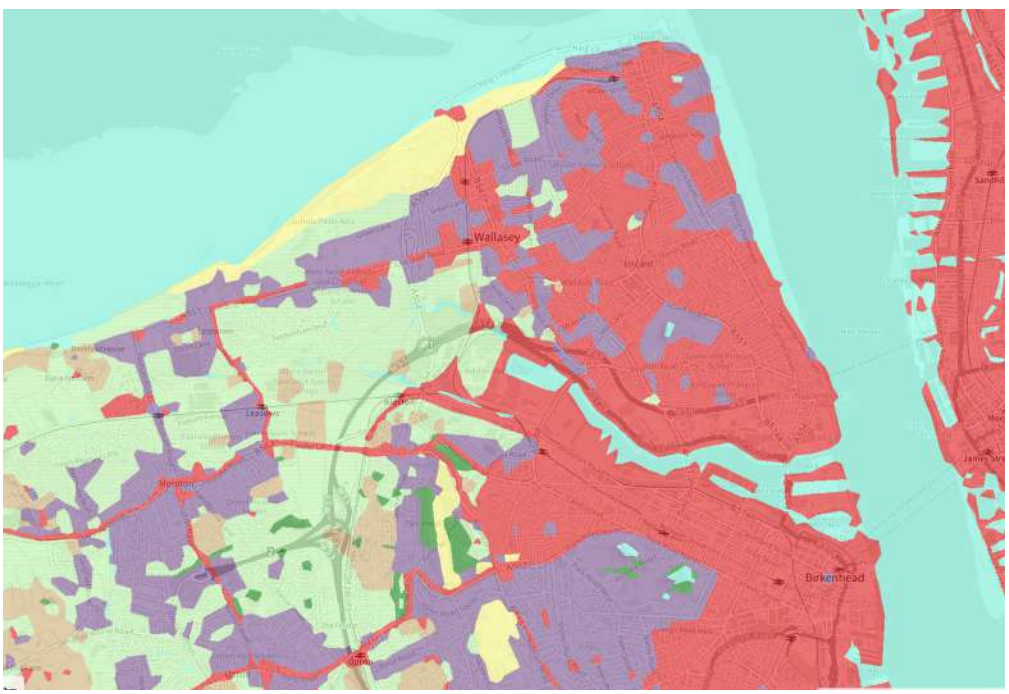
3: Sandstone Hills
- 3a: Bidston Sandstone Hills
- 3b: Thurstaston and Greasby Sandstone Hills
- 3c: Irby and Pensby Sandstone Hills
- 3d: Heswall Dales Sandstone Hills

4: Lowland Farmland and Estates
- 4a: Landican and Thingwall Lowland Farmland
- 4b: Thornton Hough Lowland Farmland and Estates
- 4c: Clatterbrook and Dibben Valley Lowland
- 4d: Raby Lowland Farmland and Estates

5: Coastal Waters
- 5a: North Wirral Foreshore and Coastal Waters

6: Estuaries
- 6a: Dee Estuary
- 6b: Mersey Estuary

landscape classification



Dudley Stamp Land Use Inventory (England)

- 1 - Rough grazing
- 2 - Urban
- 3 - Water
- 4 - Arable
- 5 - Suburban
- 6 - Grassland
- 7 - Woodland
- 8 - Orchard

Ministry of Agriculture, Fisheries and Food
Welsh Office Agriculture Department

ADAS

Agricultural Land Classification of England and Wales

Introduction

Agricultural land is classified into five grades on a national basis. Each grade is recognised by a separate colour. Existing urban areas and land scheduled for urban use are coloured red. Other areas primarily in non-agricultural use, (woodland and public open spaces etc) are coloured orange. The map is based on the Provisional 1:63,360 series and may be modified in the light of new information. Agricultural land is graded according to the degree to which its physical characteristics impose long-term limitations on agricultural use. The limitations may affect the range of crops which can be grown, the level of yield, the consistency of yield and the production costs. Ability to grow a wide range of crops (including grass), whether actual or potential, is given considerable weight but does not outweigh the ability to produce consistently high yields of a somewhat narrower range of crops.

The grading of agricultural land is on the basis of physical quality alone and the main physical factors taken into account are climate, relief and soil. Less permanent factors such as standard and adequacy of fixed equipment, level of management, farm structure and accessibility have not been considered. The grades give no indication of the relative values of farms located on them, either as a source of income or capital. The range of land quality is narrowest in Grades 1 and 2 and widest in Grade 3.

Description of the grades

Grade 1

Land with very minor or no physical limitations. The soils are deep, well drained loams, sandy loams, silt loams or peat, lying on level sites or gentle slopes and are easily cultivated. They retain good reserves of available water, and are either well supplied with plant nutrients or highly responsive to fertilisers. No climatic factor restricts their agricultural use to any major extent.

Yields are consistently high on these soils and cropping highly flexible. Most crops can be grown, including the more exacting horticultural crops.

Grade 2

Land with some minor soil limitations which exclude it from Grade 1, though minor climatic or site restrictions, such as exposure or slope, may also cause land to be included in the grade.

These limitations may hinder cultivations or harvesting of crops, lead to lower yields or make the land less flexible than that in Grade 1. A wide range of agricultural and horticultural crops can usually be grown, though there may be restrictions in the range of horticultural crops and arable root crops.

Grade 3

Land with moderate limitations due to the soil, relief, climate (or some combination of these factors) which restrict the choice of crops, timing of cultivations, or level of yield. Soil defects may be of structure, texture, drainage, depth, stoniness or water holding capacity. Altitude, slope or rainfall, may also be limiting factors. Land over 122m (400ft) which has more than 1016mm (40in) annual rainfall (1145mm (45in) in North West England, Western Wales and the West Country) or land with a high proportion of moderately steep slopes (1 in 8 to 1 in 5) will generally not be graded above 3.

The range of cropping is comparatively restricted. Less demanding horticultural crops can be grown. Towards the bottom of the grade arable root crops are limited to forage crops. Land in the middle range of the grade is capable of giving reasonable yields under average management. Grass and cereals are thus the principal crops.

Some of the best quality permanent grassland may be placed in this grade where the physical characteristics of the land make arable cropping inadvisable.

Grade 4

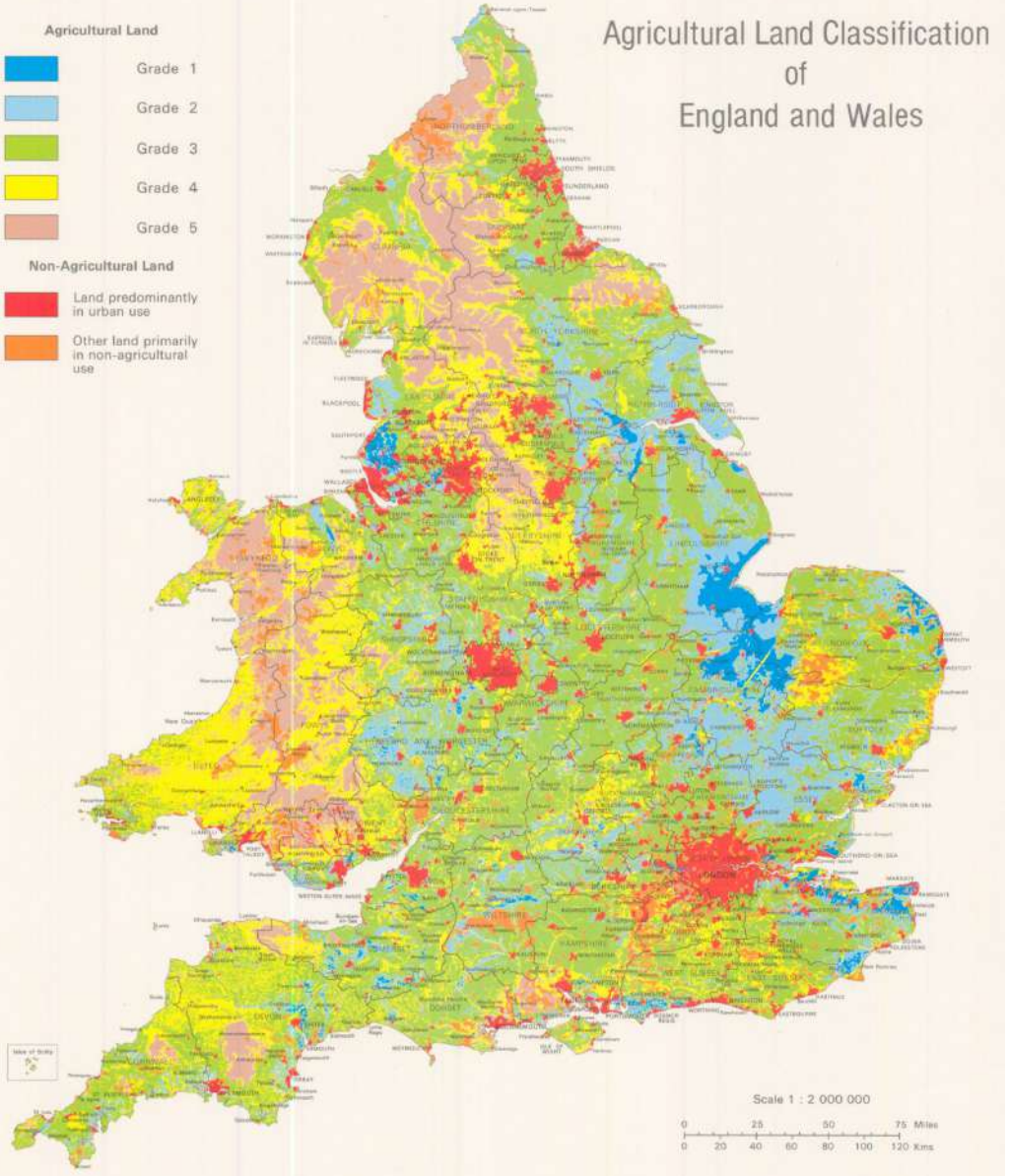
Land with severe limitations due to adverse soil, relief or climate, or a combination of these. Adverse soil characteristics include unsuitable texture and structure, wetness, shallow depth, stoniness or low water holding capacity. Relief and climate restrictions may include steep slopes, short growing season, high rainfall or exposure. Land over 183m (600ft) with over 1270mm (50in) annual rainfall or land with a high proportion of steep slopes (between 1 in 5 and 1 in 3) will generally not be graded above 4.

Land in this grade is generally only suitable for low output enterprises. A high proportion will be under grass, but there may be occasional fields of oats, barley or forage crops.

Grade 5

Land with very severe limitations due to adverse soil, relief or climate, or a combination of these. The main limitations include very steep slopes, drainage, shallow depth of soil, excessive stoniness, low water holding capacity and severe plant nutrient deficiencies or toxicities. Land over 305m (1,000ft) which has more than 1525mm (60in) annual rainfall or land with a high proportion of very steep slopes (greater than 1 in 3) will generally not be graded above 5.

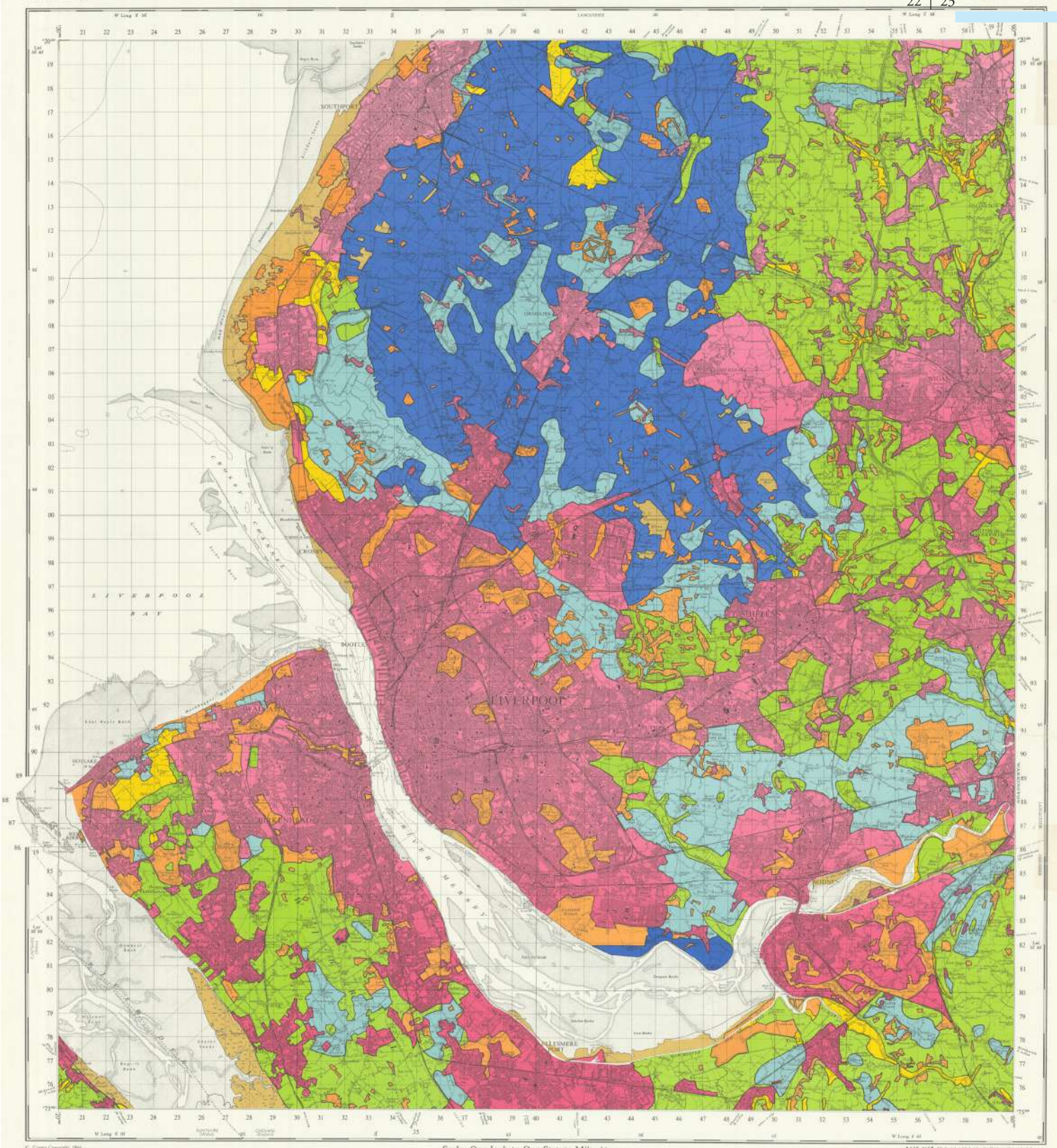
Grade 5 land is generally under grass or rough grazing except for occasional pioneer forage crops.



Provisional

AGRICULTURAL LAND CLASSIFICATION OF ENGLAND AND WALES

SHEET 100



© Crown Copyright 1966

AGRICULTURAL LAND

- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5

NON-AGRICULTURAL LAND

- Land in urban use
- Other land primarily in non-agricultural use

Land Classification information prepared by the Agricultural Land Service of the Ministry of Agriculture, Fisheries and Food, with the assistance of the National Agricultural Advisory Service and the Soil Survey of England and Wales, 1969

Scale: One Inch to One Statute Mile – 1/63360

Miles
Yards
Kilometres

TO GIVE A GRID REFERENCE CORRECT TO 100 METRES

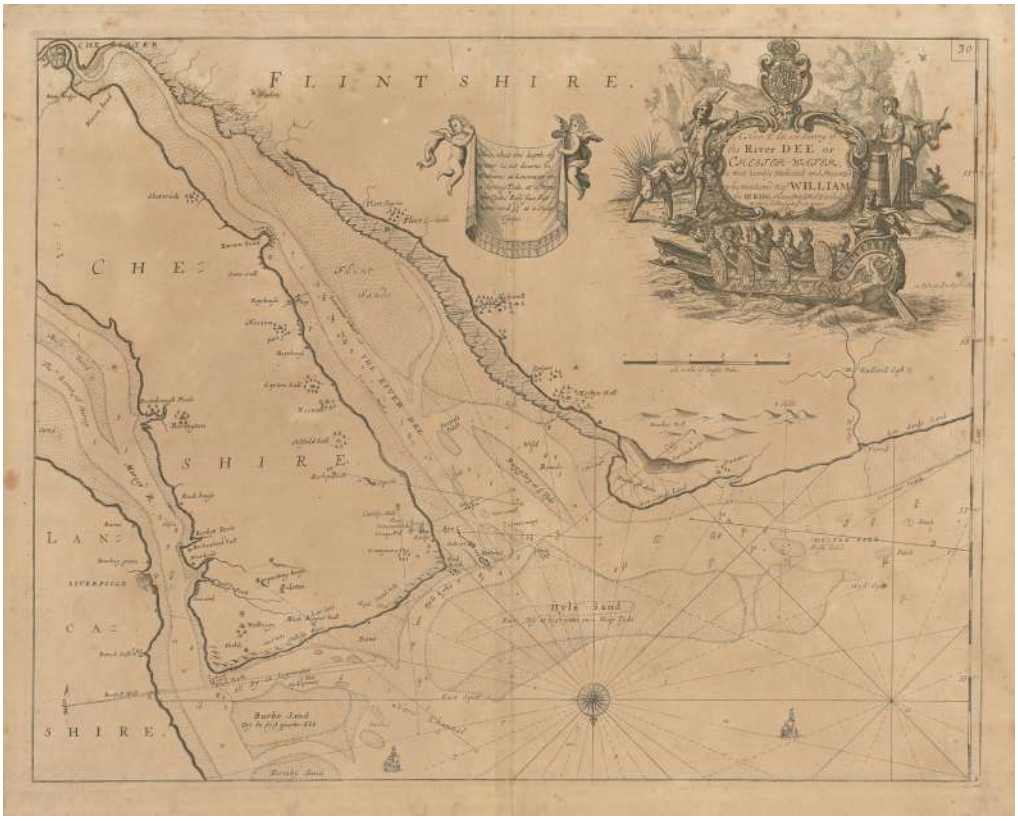
EXAMPLE

BASE MAP Made and published by the Director General of the ORDNANCE SURVEY, CHESSINGTON, SURREY, 1966

SHEET 100

Obtainable from the Ministry of Agriculture, Fisheries and Food, Government Buildings, Tolcarne Drive, Pinner, Middlesex.

chart the coasts

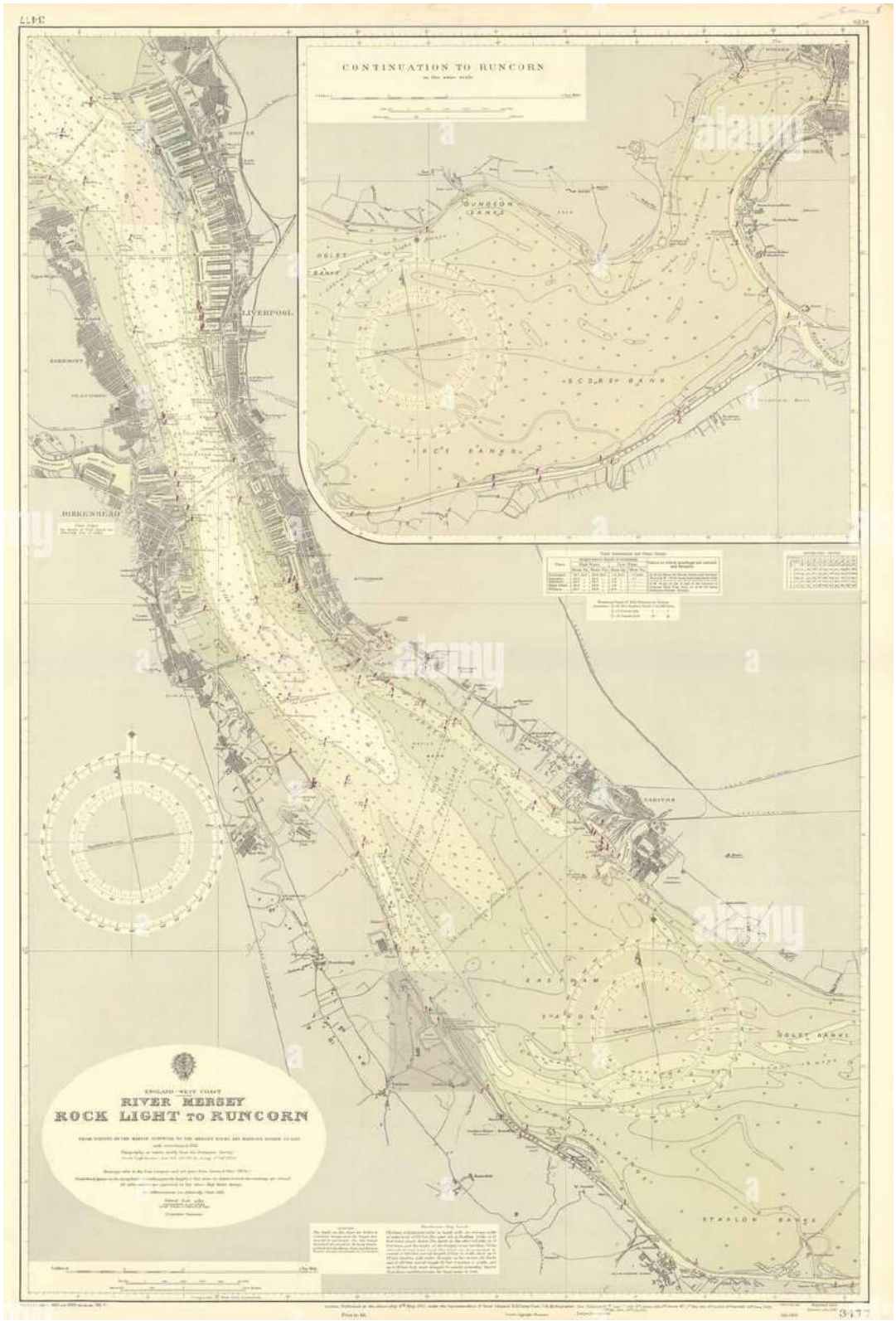


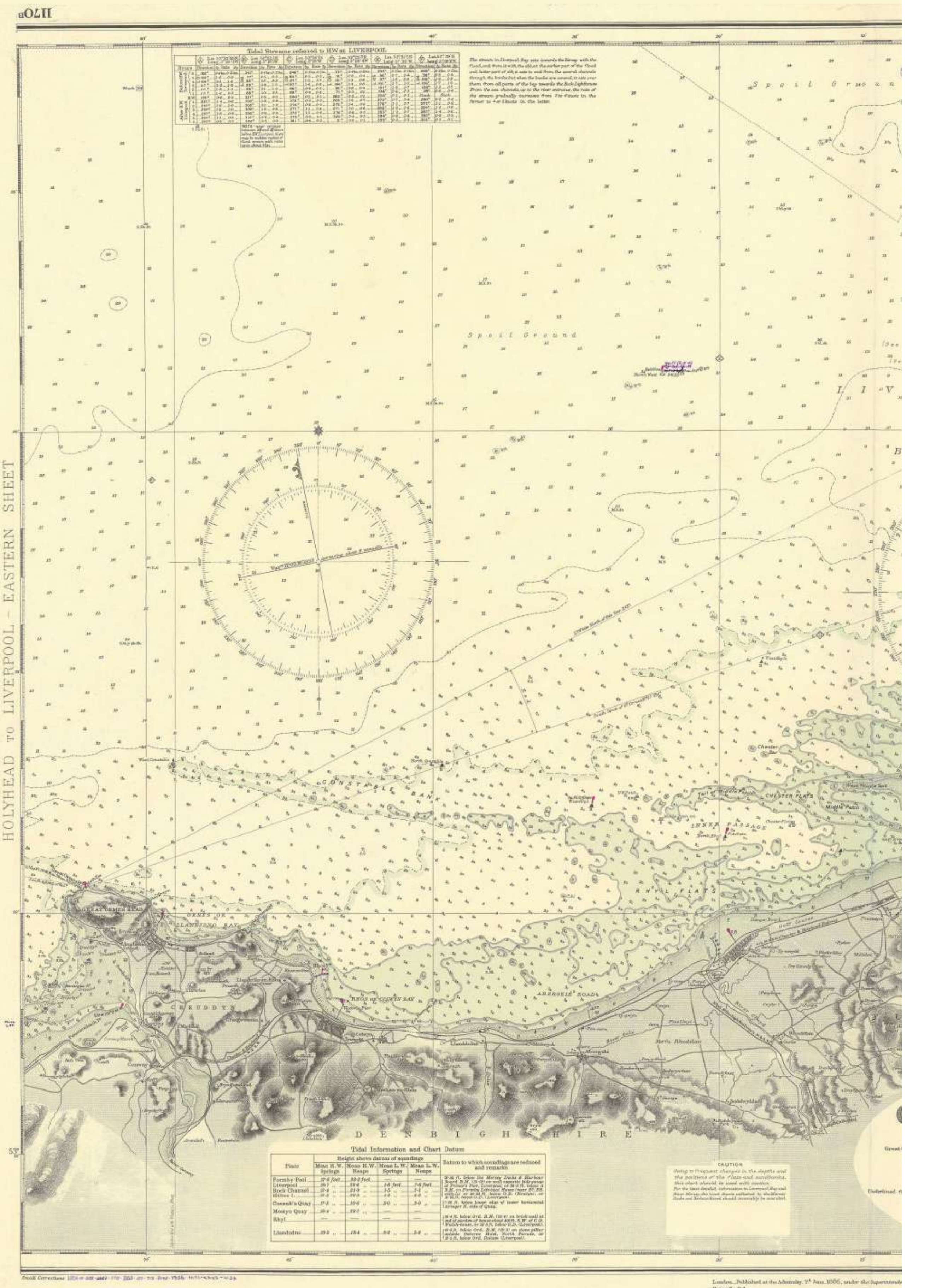
Collins was an officer of the Royal Navy and prominent hydrographer, who was commissioned by King Charles II in 1676 and appointed by Samuel Pepys to chart the coasts of Great Britain. The resulting atlas - Great Britain's Coasting Pilot - was the first original sea atlas to be produced by an Englishman. Prior to publication of these maps, nautical charts were often defective, and there was no centralised system for collecting and disseminating the better maps made by experienced seamen.

In 1681, Collins gained the king's preferment to survey the country's coasts.

Collins spent seven years on the survey, the first edition of which was published in 1693, as "Great Britain's Coasting Pilot".

Twenty-one further editions were published during the eighteenth century


CONTINUATION TO RUNCORN
LIVERPOOL
BIRKENHEAD
ENGLAND · WEST COAST
RIVER MERSEY
ROCK LIGHT TO RUNCORN



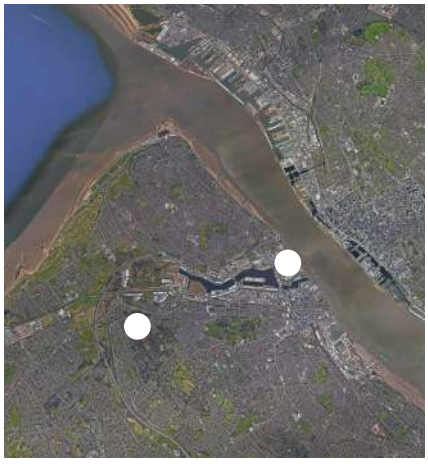
London. Published at the Admiralty 1st June 1886, under the Superintende…
Price 2s.0d.


SOUTHPORT
LANCASHIRE
LIVERPOOL
BIRKENHEAD
CHESHIRE
Edge Hill
LIVERPOOL BAY
QUEENS CHANNEL
NEWCOME KNOLL
EAST HOYLE BANK
HOYLE BANK
SPENCERS SPIT
SALISBURY BANK
WEST HOYLE BANK
WELSH CHANNEL
HOLYWELL BANK
HESWALL BANK
GAYTON SANDS
BAGILT BANK
WHITE SANDS
RIVER DEE
RIVER MERSEY
FLINTSHIRE
ENGLAND – WEST COAST
GREAT ORMES HEAD
TO LIVERPOOL
H.M. SURVEYING SHIP "BEAUFORT" 1926 – 1929.
Liverpool Bay & R. Dee entrance from surveys by the Mersey Docks & Harbour Board to 1952
SOUNDINGS IN FATHOMS
Projection: Mercator
Longitude 3° West from Greenwich
under the Superintendence of Captain W. J. L. Wharton, R.N. Hydrographer
1170B

/ geology storys

/ Explore with new knowledge

geology stories /what fondations ?



Birkenhead Priory is one of the oldest buidings in Merseyside. Founded in around 1150 it was built on solid foundations on the banks of the Mersey directly on the Triassic Chester Pebble Formation. (The arch in the photo is from St Mary's church built on the site in the early 19th century.)
The docks to the south are constructed on 'made ground' on the much weaker Wilmslow Formation Sandstones.

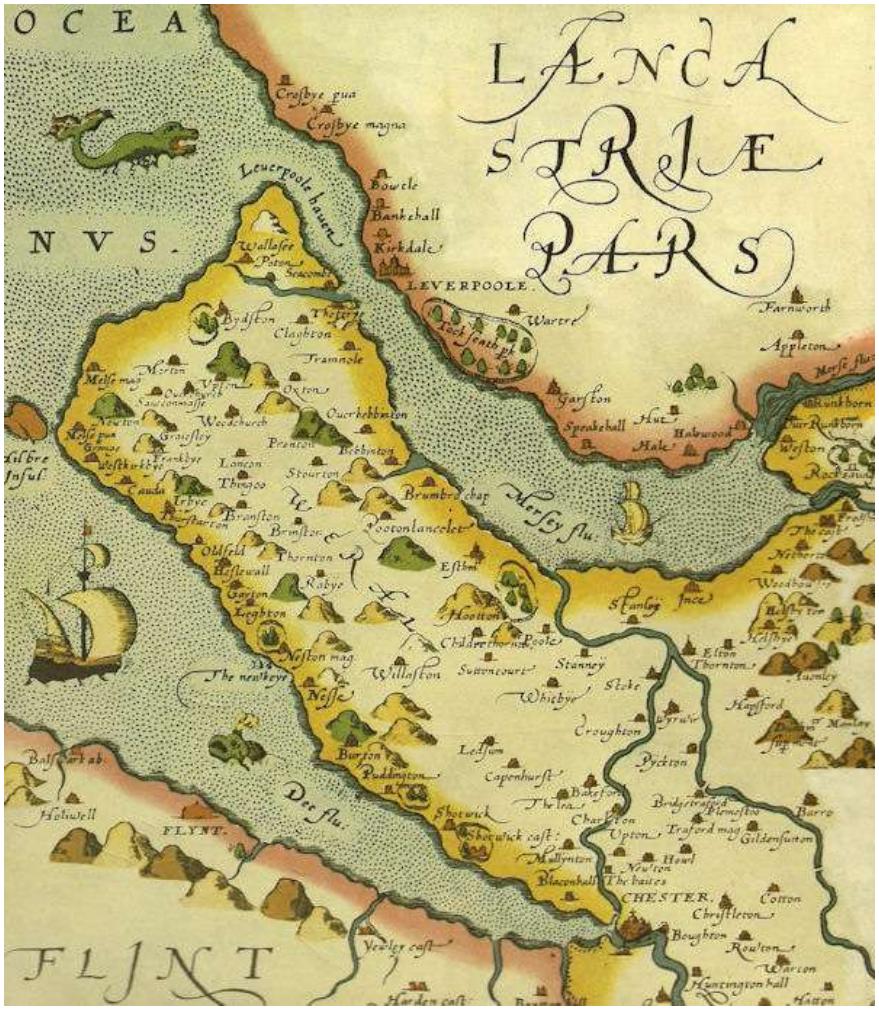
It is a grey sandstone building, probably built about 1535

It is a grey sandstone building, probably built about 1535, and rebuilt in 1620 by William, sixth Earl of Derby.
Signs of stone extraction - cut faces below the stone wall suggest stone extraction in the past.

Capping sandstone - Bidston Hill - immediately below Lighthouse and Observatory

This thin cross bedded fluvial sandstone (at the Base of the Helsby Formation) - it is very resisitant to weathering and forms the crest of the Bidston Escarpment. *(the slopes below are largely comprised of poorly cemented Wilmslow Fm sandstones).

WIRRAL Spirit: what's above is what's beneath us



1. The Wirral Peninsula, characterized by its liminal nature, exists at the intersection of various contrasting cultures and places, marked by the River Dee and the River Mersey, creating a sense of being on multiple thresholds.

2. Its identity is complex and fragmented, not entirely aligning with the urbanity of Liverpool, the rural aspect of North Wales, or the poshness of Cheshire, leading to a unique, multifaceted character.

3. Described as a 'ghost place,' The Wirral embodies a blend of many identities, where its deep-rooted ancientness coexists with modern contradictions, reflecting a history and character that are constantly evolving.

Tower, St Hilary's Church 13th century
The lower part is the older, and the upper parts date from 1530.

The Old House 1627
A house mainly in stone with some brick at the rear and with a slate roof.

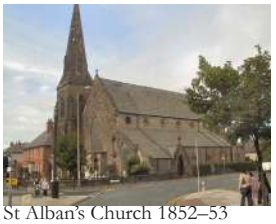
Old Rectory 17th century
A stone house with a roughcast (local stone)20th-century extension

180 Breck Road 1799
Built as Wallasey Grammar School and later used as a private house. It is in stone with a slate roof

8–26 Manor Road
Early 19th century
A terrace of ten stone houses with slate roofs

St John's Church 1832–33
A church, now redundant, by Henry Turberville Edwards..
It is with stone dressings and a stone façade

St Paul's Church 1846–47
The church 1300, and was enlarged in 1859 and in 1891.
It is in sandstone with Welsh slate roofs



St Alban's Church 1852–53
A Roman Catholic church by Stephen R. Eyre and Joseph Hansom in stone with a slate roof.

Gateway to former Liscard Battery 1858
he entrance to the former battery is in stone

St Hilary's Church 1858–59
It was designed by W. and J. Hay, and is built in stone with a slate roof.

St Mary's Church 1876–77
tower 1882, . It is built in local yellow sandstone with dressings in red sandstone from Runcorn

Water tower 1860
The water tower is in brick on a stone base with stone dressings.

Egremont Presbyterian Church 1907
red sandstone church stone came from the quarries in Runcorn.

Church Cottage 1499
Sandstone and brown brick; stone slate roof with coped gables and two brick stacks.

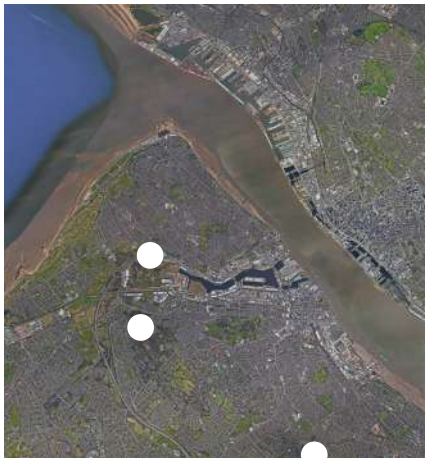
Bishop Wilsons Cottage
1663

Pear Tree Cottage
1682

St Marys Church School.

Brimstage Hall
1175 - 1350

bricks, stones and plates



Former Barker and Briscoe Brickworks
Glacial till (boulder clay) was quarried on site. The clay was used for brick making - larger stones were used as road stone.
This one was active for more than 100 years and at it's peak produced 230,000 bricks/week.
Most of the workings have been filled with landfill waste.

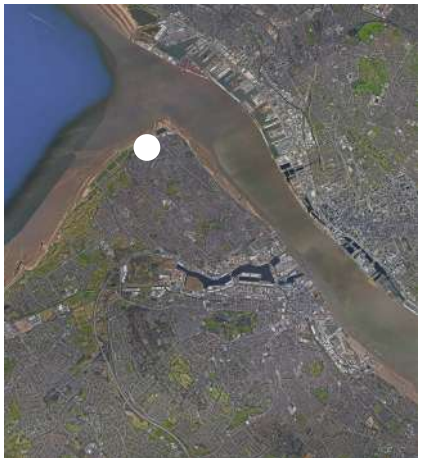
Seacombe Pottery, established by John Goodwin, was renowned for its quality pottery, proximity to Liverpool and the docks for exporting goods. The factory, opened in 1852, was well-equipped and quickly gained international acclaim. Goodwin's pottery, particularly favored in Canada, led to the opening of a second factory in Toronto.

Storeton Sandstone Quarries.

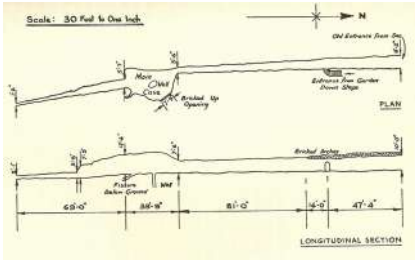
Sandstone, part of the Helsby Sandstone formation on the Storeton Ridge was quarried here from Roman times until the mid 1900s. The sandstone was used for decorative, memorial and building purposes. There were three quarries ie Storeton North, Storeton South and Jackie's Wood quarry on the east side of Mount Road. Quarrying was stopped at the older North Quarry by the 1890s and by 1905 both the North and South quarries had ceased production. Peak production in Jackie's Wood quarry was in 1914. Spoil from the **Birkenhead Tunnel excavations** was used to fill in the two disused north and south quarries and later the Jackie's Wood quarry was filled in using **spoil from the Wallasey Tunnel excavations.**

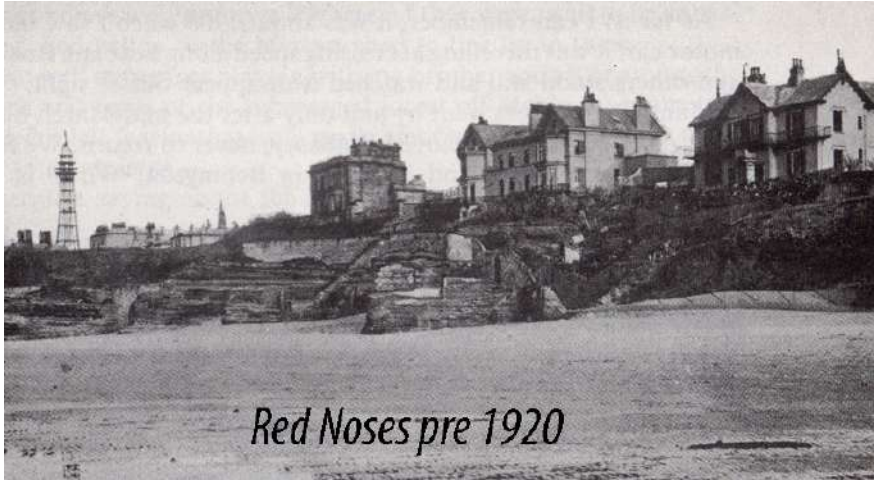
The sandstone ranged from yellow soft stone in the upper beds to silvery white and darker brown in the lower beds. As well as for local use, the quarried sandstone was exported and used to clad parts of the Empire State Building in New York.

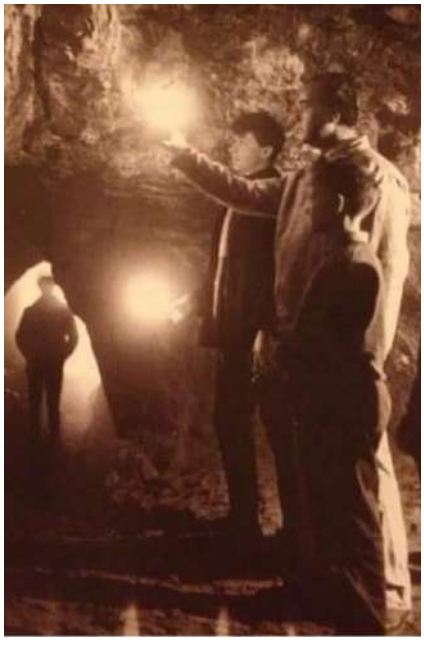
smugglers @ Red Noses



Red & Yellow Noses as painted by Harold Hopps in 1900







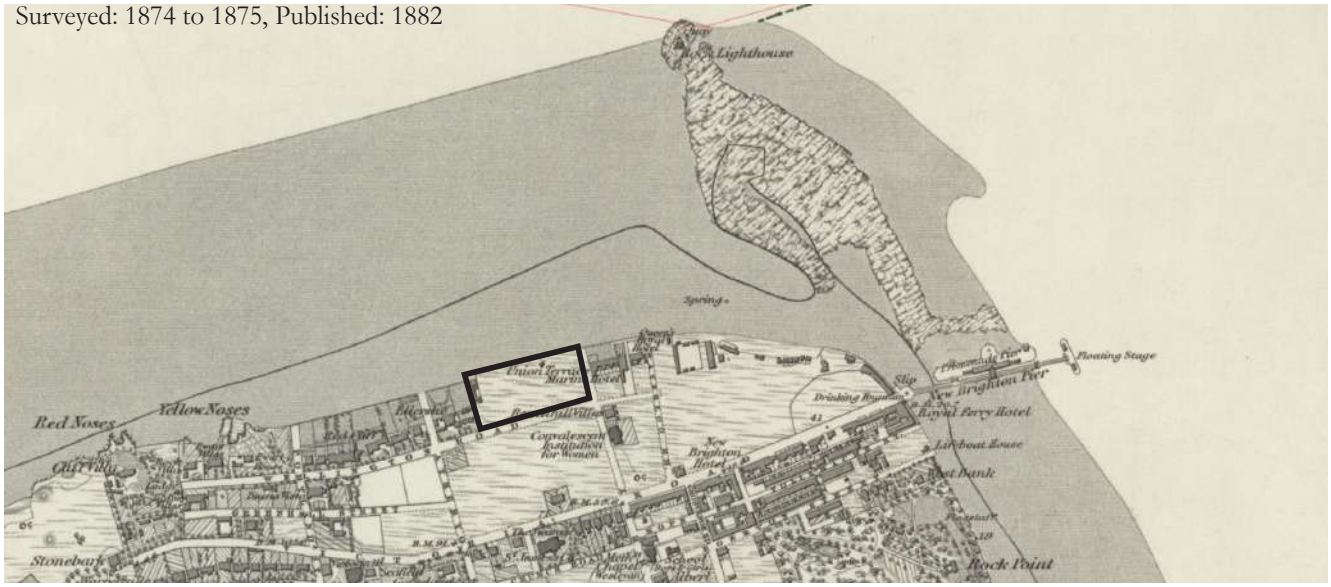
In 1959, Rock Villa in New Brighton, known for its historical caves formed from the soft stone of the Red and Yellow Noses, was bought by architect Norman Kingham. These smuggler caves, once accessible from the shore, were obscured by the construction of the promenade, leaving entry possible only through the villa's garden. Up until the early '90s, these caves were a destination for local school outings but today, they remain concealed from the public

Tabular Cross bedding - with 'assymptotic toes'. Only the top section of the cliffs painted by Harold Hopps in 1902 remain exposed Mulitcoloured exposures of Wilmslow Sandstone

White, Red and Yellow. The colour of the local Triassic sandstones is due to the variable presence of iron minerals coating the quartz sand grains. Red - iron oxide (haematite), Yellow - iron hydroxide (limonite), White - no iron - it has been leached away in groundwaters.

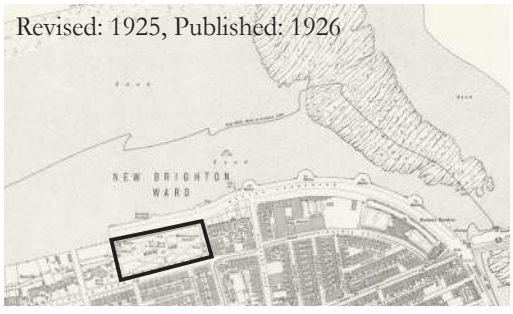
The coastal sand dunes are cut off from a supply of new beach sand by modern sea defences and the carpark. The dune complex along this shoreline likely accumulated wind blown beach sand for much of the last 10 thousand years.
Dunes have been stabilised by marram and other grasses but are being eroded by footpaths etc.

Surveyed: 1874 to 1875, Published: 1882



Surveyed: 1898, Published: 1899

Revised: 1925, Published: 1926

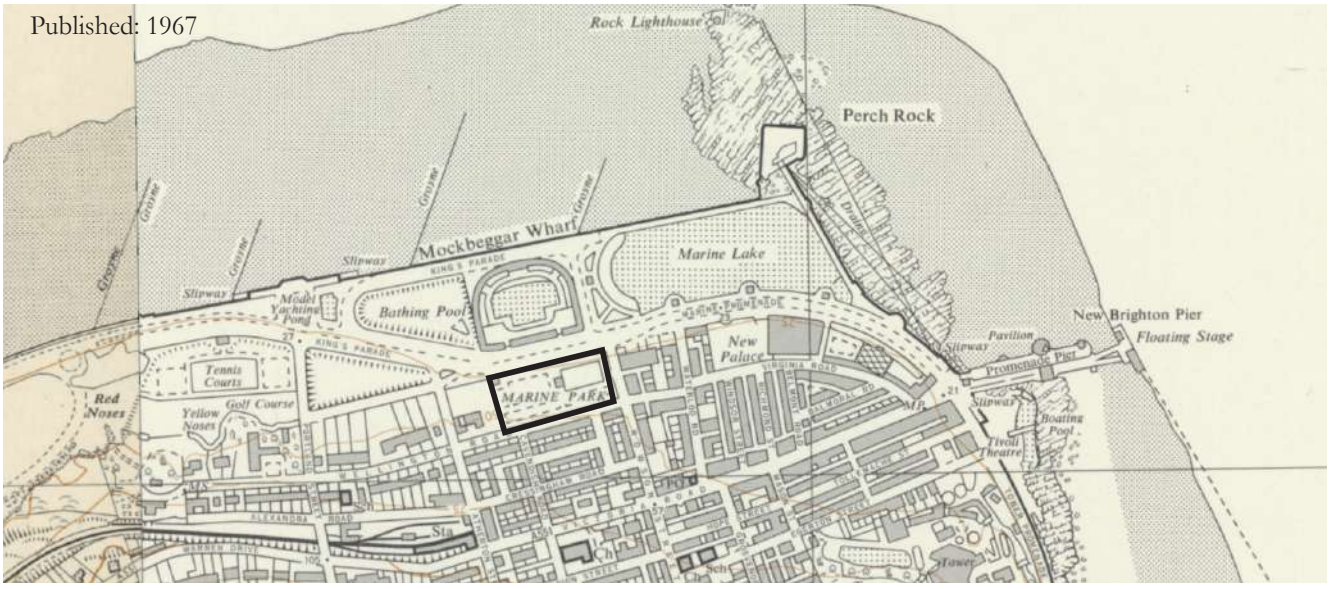


Revised: 1935, Published: 1937

Promenade gradually spreading from east to west, it sealed the riverfront, slipways and cliffs to the east of New Brighton.

By 1911, another promenade had been constructed in front of what is now the Floral Pavilion Theatre. This extended further onto the foreshore and sealed the circa 1897 promenade. The addition of four ornate cast-iron shelters located on rounded promontories provided somewhere to shelter.

Construction of New Brighton's final prom commenced from 1931. This massive undertaking would include the construction of an open air swimming baths (which was set to become the largest of its type in Europe), a marine lake anad a range of Art Deco style shelters and pavilions.

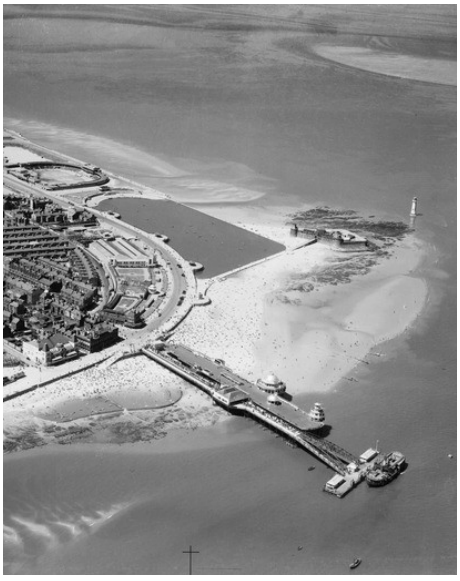


Construction of New Brighton's final prom commenced from 1931. This massive undertaking would include the construction of an open air swimming baths (which was set to become the largest of its type in Europe), a marine lake and a range of Art Deco style shelters and pavilions.

Derby pool 1932

Located on Harrison Drive in New Brighton, has historical roots tracing back to a racecourse built by Lord Derby in the early 17th century. In the 20th century, it was known for its Art Deco swimming pool, a popular attraction for both Wallasey locals and Liverpool day-trippers. Despite its popularity, the pool faced storm damage and was eventually closed in the 1980s due to repair costs. It has since been refurbished and now operates as a restaurant, retaining the name "The Derby Pool," and offers views of the bay area.

The New Brighton Pier, initially a basic landing point for workmen, evolved into a popular attraction.. In 1861, the New Brighton Pier Company took over the project. The new pier, opened in 1867, featured shops, cafes, and a pavilion for entertainment. This development boosted New Brighton's popularity as a tourist destination, supported by a tram system for easy access. However, by the 1920s, the pavilion declined, leading to its closure in 1923.



New Brighton Pier, 1946

The pier underwent several alterations before being completely rebuilt in 1931, but by the 1960s, the ferry service diminished, leading to the pier's eventual demolition in 1973.

New Brighton Pier, August 1970

The pier in 1977, shortly before demolition

The decline in part attributed to the loss of the golden sands as a result of expansion from Liverpool Docks altering the currents which created a polluted foreshore.

year 1923

year 1960

year 2000

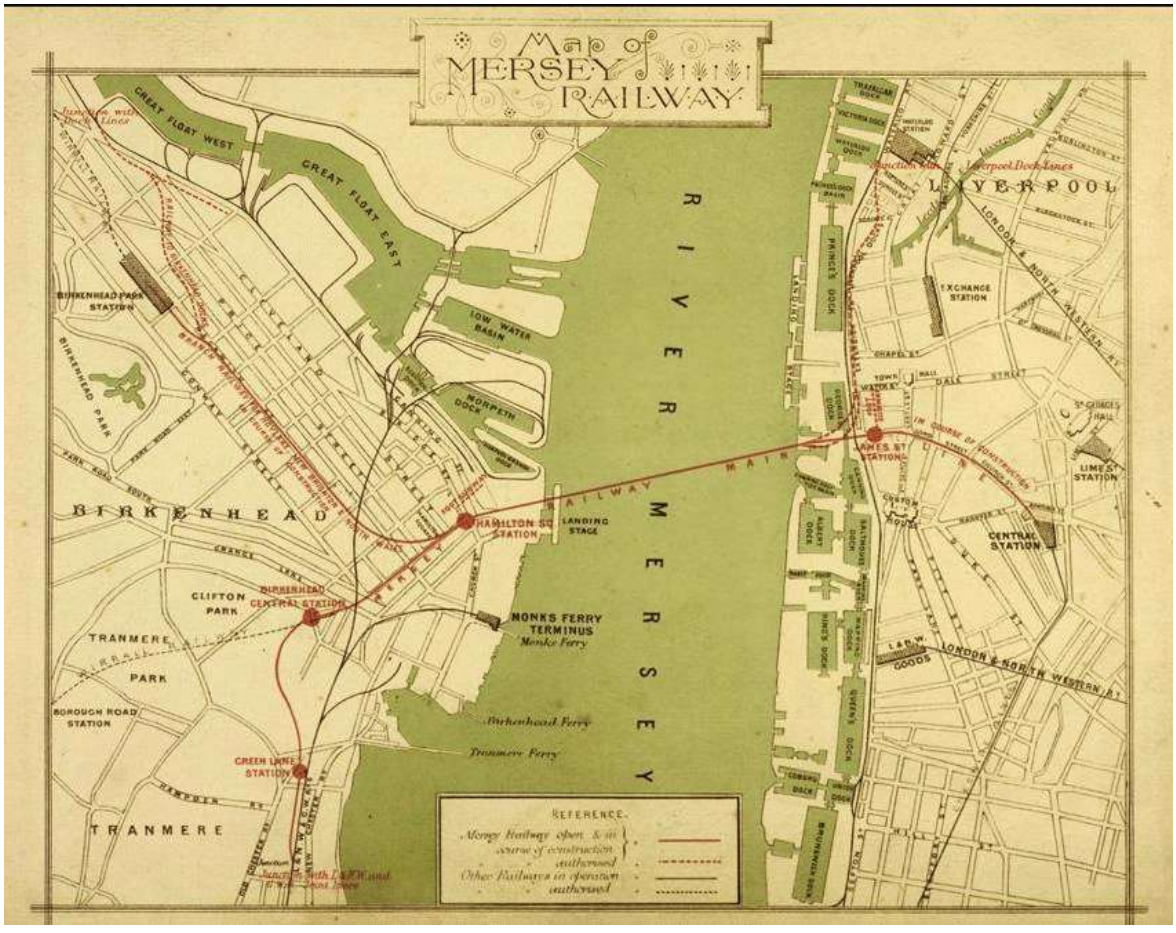
year 2010

year 2022

/ tunneling triumphs

/ man vs. ground

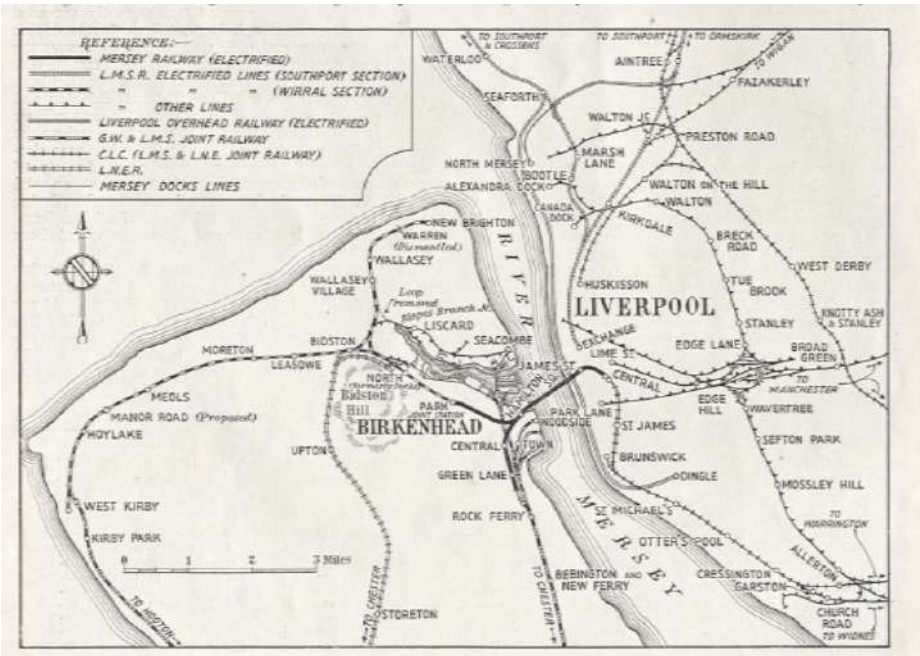
tunneling triumphs / Mersey Railway Tunnel Constructed 1881- 1886



1886 Mersey Railway Company 190 Map of the route of the Mersey Railway Tunnel

A map of the Mersey Railway Tunnel showing the stations on the Liverpool and Birkenhead sides of the River Mersey. When it first opened in January 1886 the Mersey Railway only ran between James Street station, Liverpool and Green Lane station, Birkenhead.

Railway map of Liverpool, The Wirral & Merseyside, c1938
This sketch map reveals the intricate Merseyside railway network right before World War II and subsequent nationalisation.

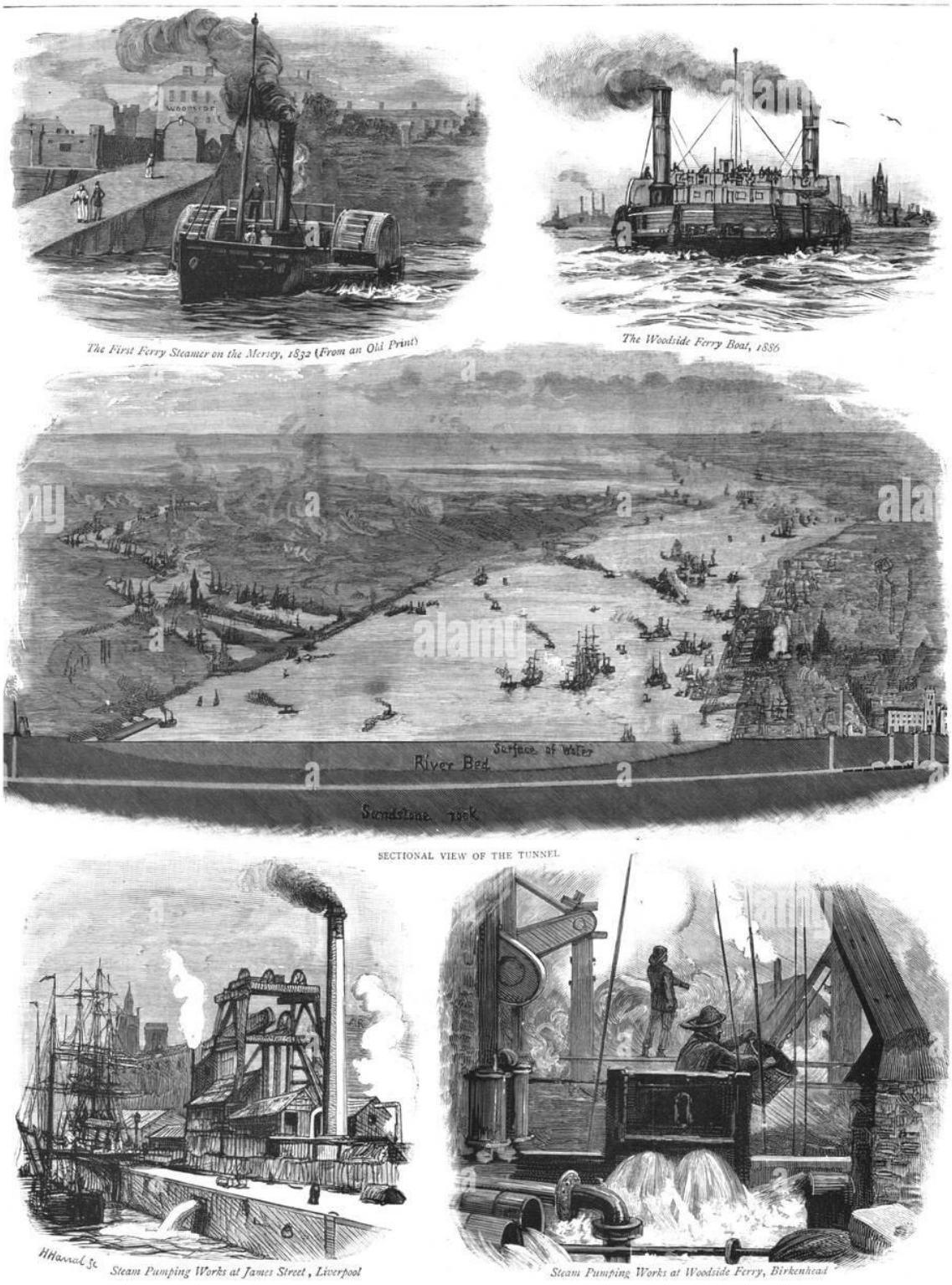


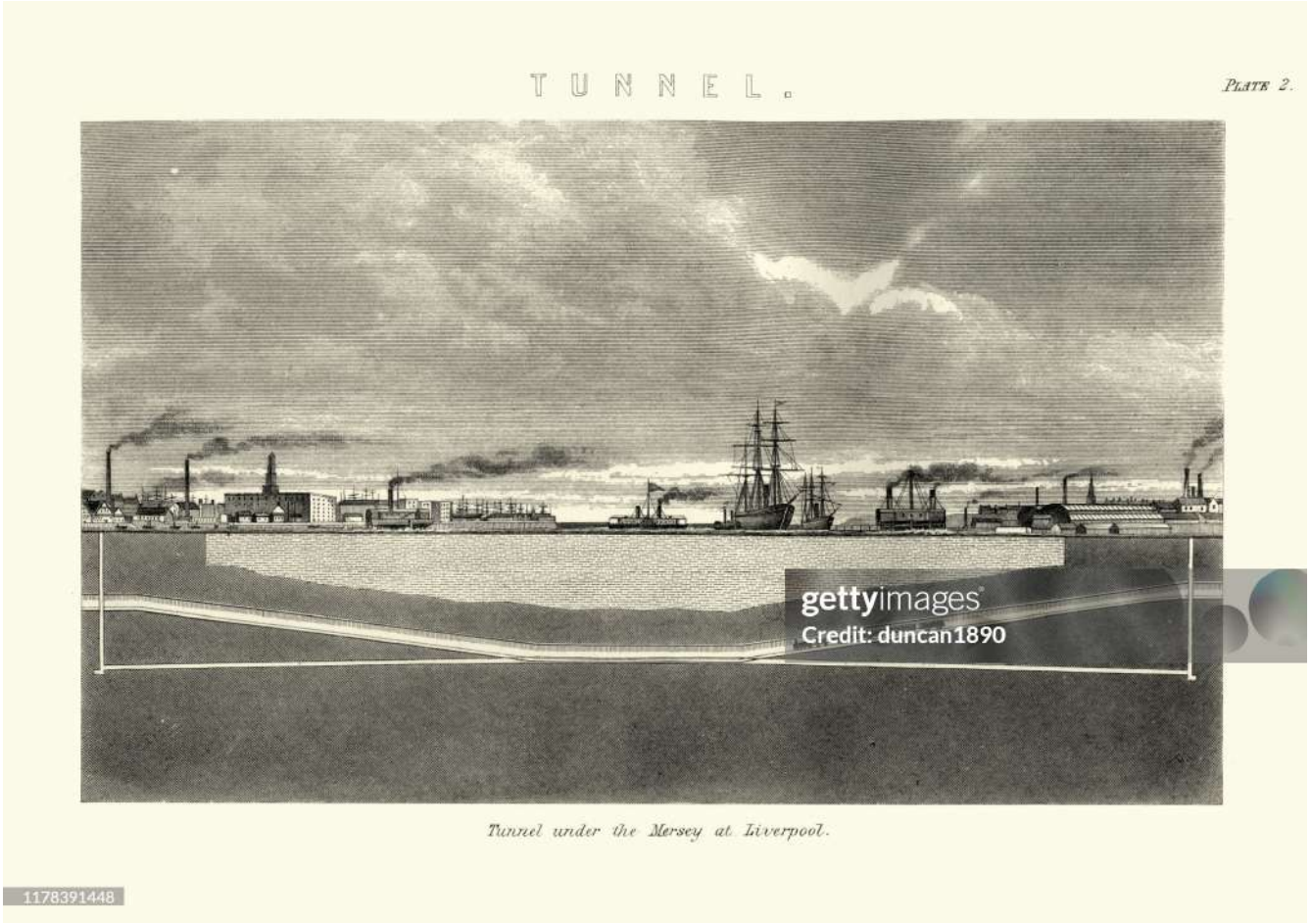
Map showing electrified lines in the vicinity of Liverpool, including the recently converted Wirral lines of the L.M.S.R.

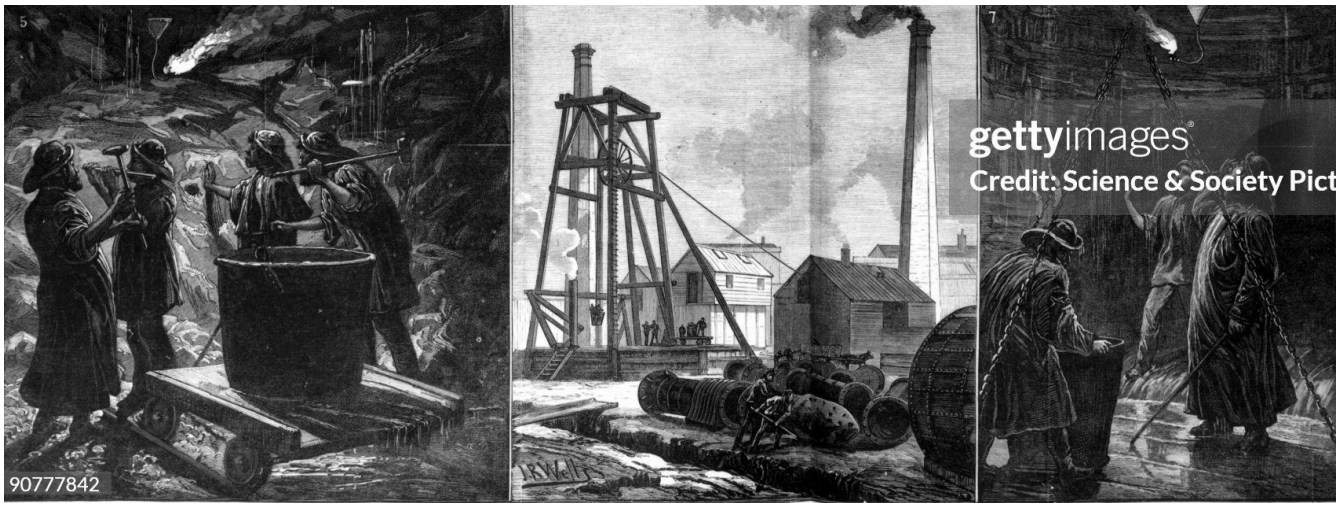
The Mersey Railway, opened in 1886, was the world's first deep-level underground railway and played a crucial role in connecting Liverpool and Birkenhead beneath the River Mersey. It was initially operated by steam locomotives, showcasing an early example of tunnel ventilation systems to manage smoke and fumes. Electrification of the railway was completed in 1903, making it one of the first in the world to transition from steam to electric power, enhancing efficiency and passenger comfort. The Mersey Railway contributed significantly to the economic development of the Merseyside region by improving accessibility and facilitating the movement of workers and goods. Today, it remains a key component of the Merseyrail network, continuing to serve as a vital transportation link across the River Mersey.

Because the steam locomotives created a polluted atmosphere in the tunnel, many passengers reverted to using the river ferries and the railway was bankrupt by 1900. Recovery came after the railway adopted electric traction in 1903.

Mersey Railway Tunnel Constructed 1881- 1886




TUNNEL.
PLATE 2.
Tunnel under the Mersey at Liverpool.
gettyimages
Credit: duncan1890
1178391448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Credit: Science & Society Pict
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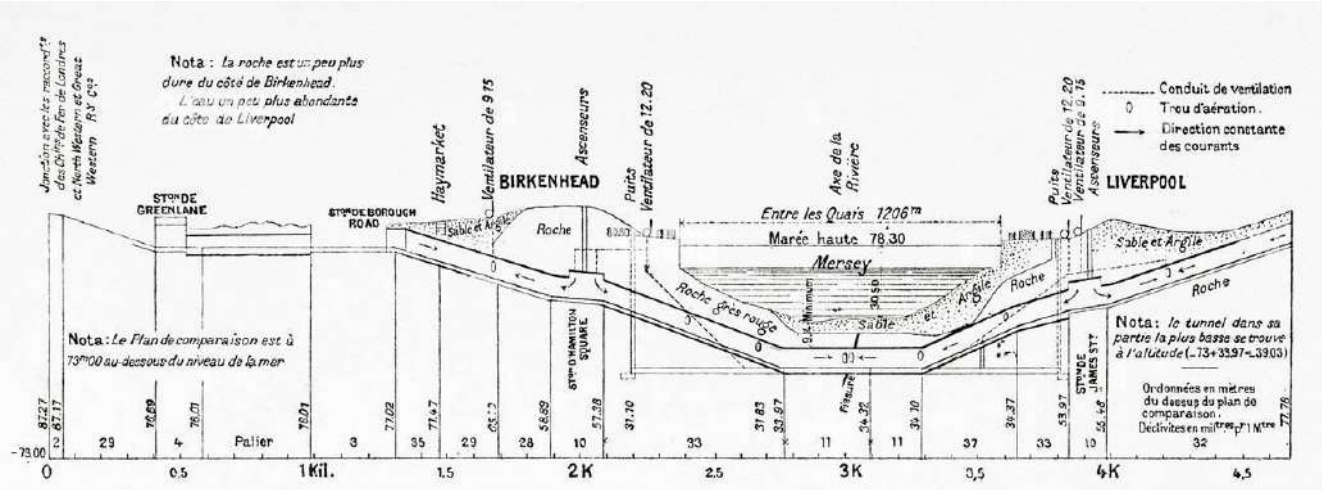
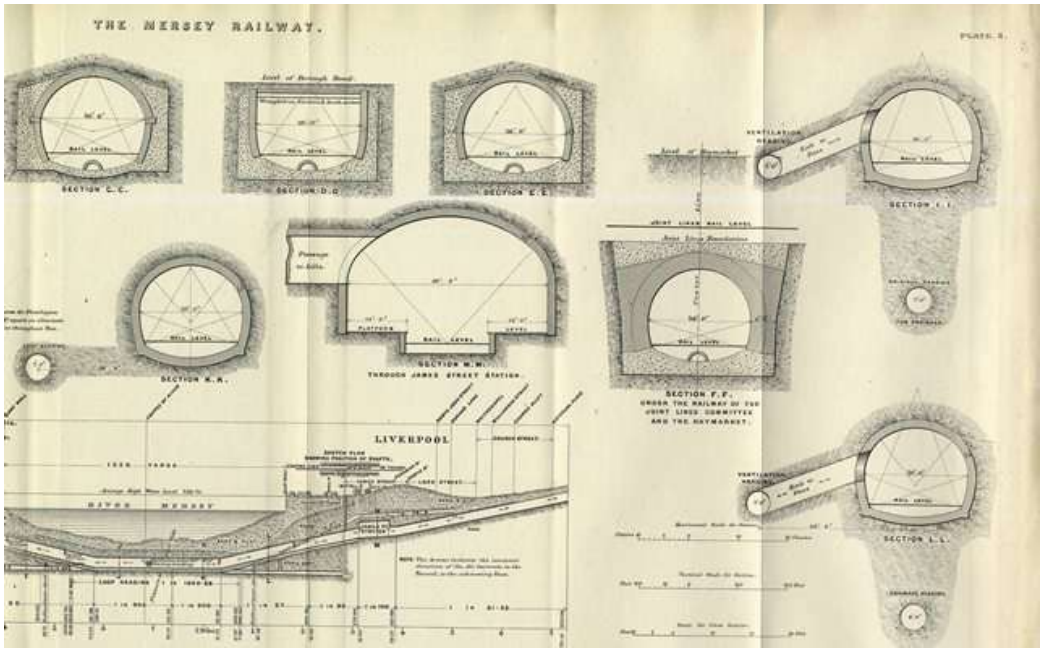
Mersey Railway Tunnel Constructed 1881- 1886

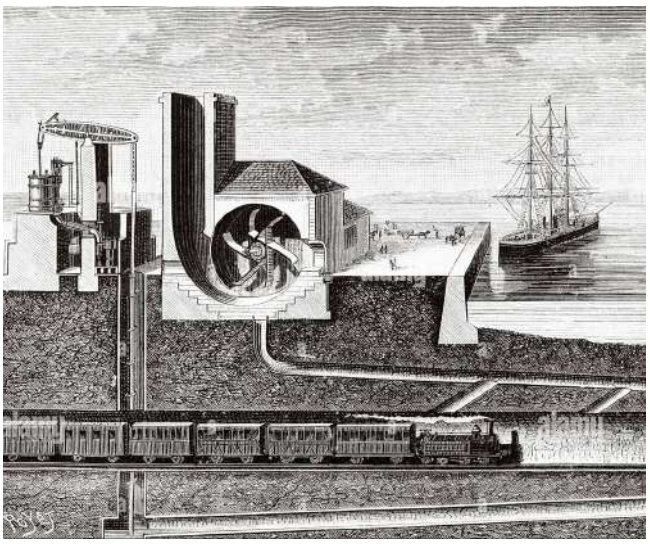


Overall section of the Mersey Tunnel, Liverpool. England. Old 19th century engraving from La Nature 1887

Construction of the river tunnel started from two 180 feet (55 m) deep shafts, one on each bank, containing water pumps. Three tunnels were to be dug, one for the two tracks, a drainage tunnel and a ventilation tunnel. A 7 feet 2 inches (2.18 m) diameter ventilation tunnel was dug as the pilot heading. Some 38 million bricks were used for the construction of the main tunnel.[5] When the tunnel was opened, fans on both banks changed the air in the tunnel every seven minutes

The geology of the riverbed meant that the plans were changed and at the deepest section the drainage and ventilation tunnels combined. The grade on the Liverpool side was increased to 1 in 27





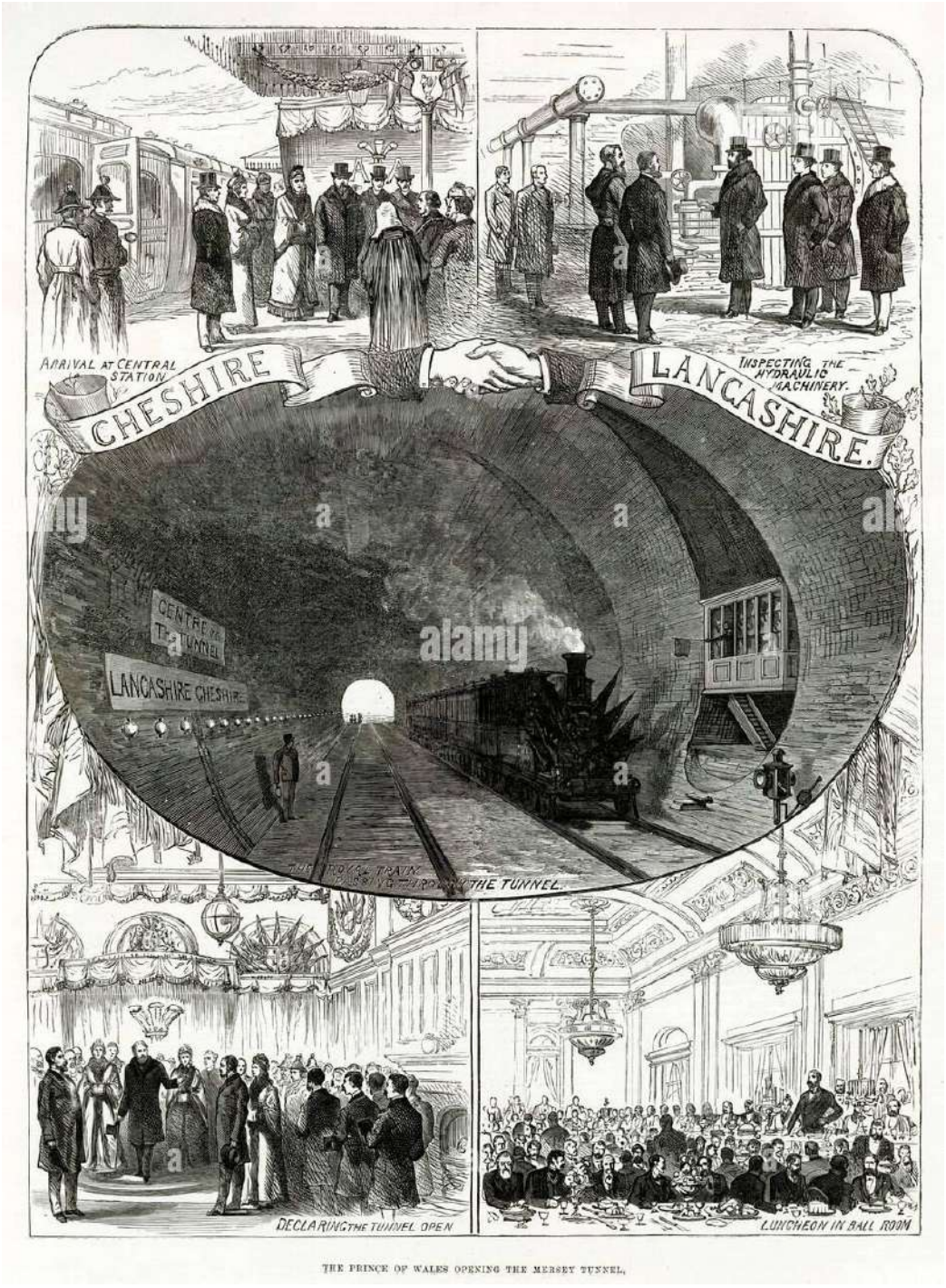
Entrance to the Mersey Tunnel with the design of the exhaust and ventilation galleries, Liverpool. England. Old 19th century engraving from La Nature 1887

Pumping Station inside

Pumping Station A Grade II Listed Building in Central, Liverpool

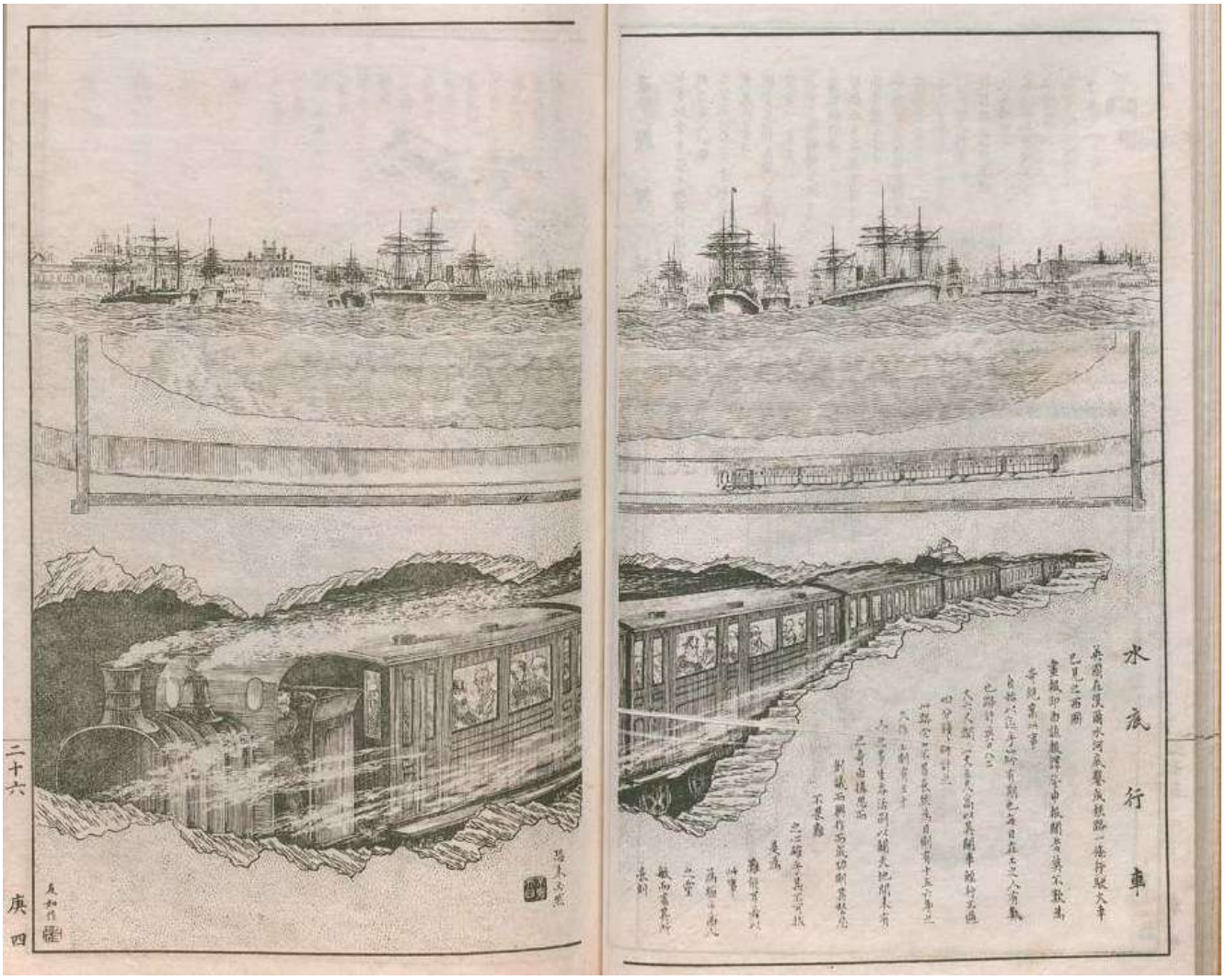
Shore Road Pumping Station, Birkenhead

Mersey Railway Tunnel Constructed 1881- 1886



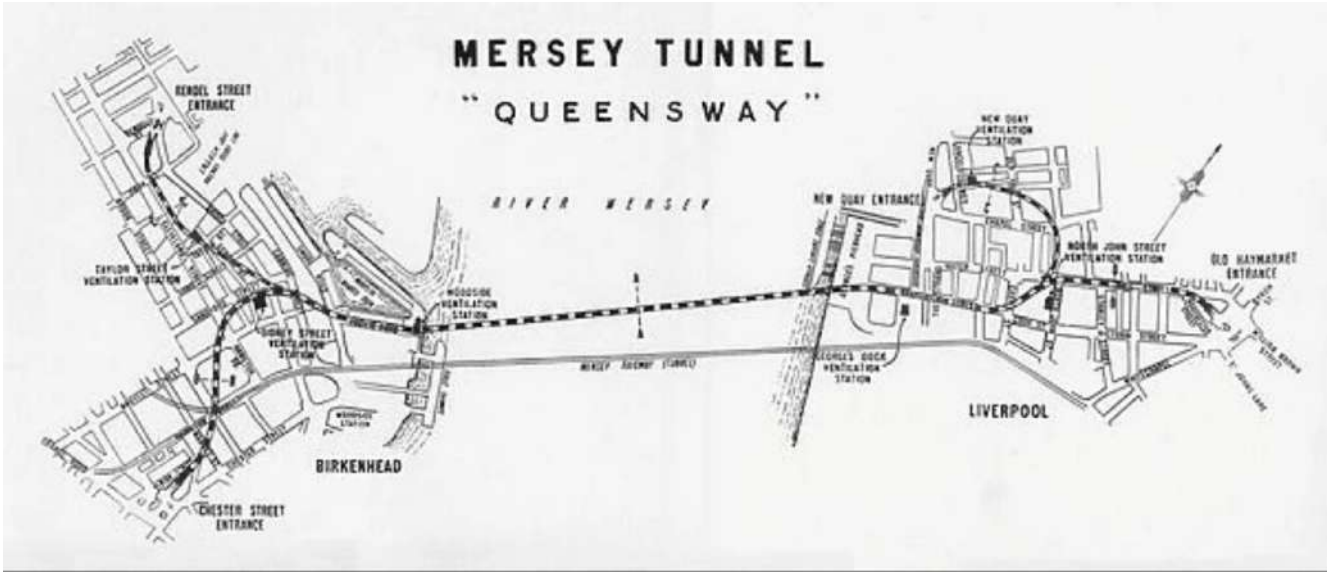
THE PRINCE OF WALES OPENING THE MERSEY TUNNEL.

The Prince of Wales opening the Mersey Tunnel, connecting Birkenhead with Liverpool. After the opening ceremony the royal train passed through the Mersey tunnel. Spectators were gathered either side of the tunnel waving at the train as it went by.



England has built a railway beneath the Mersey River for trains to pass through. This has already appeared in Western newspapers, and it has been reported in translation in Shenbao by this very press. All who learn of it gasp at the marvel. From beginning to end, this project took much time; and workers were many. The path is twenty six English feet wide, and twenty three feet tall. Though a train can pass through it in under four minute's time as the road is not particularly long, to this date it has taken fifteen or sixteen years of work to complete, and the labor of over three thousand workers. Such a precipitous moving of heaven and earth is unprecedented. From conception to planning then groundbreaking and completion took undeniable innovation and determination; it was no easy task. Yet, if we take this to be the pinnacle of Westerner's talents, there superiority may not be so certain.

tunneling triumphs / Queensway Tunnel 1925–1934



The Queensway Tunnel, opened in 1934, is a pioneering underwater roadway linking Liverpool and Birkenhead beneath the River Mersey. Engineered by Sir Basil Mott, it was celebrated as the longest road tunnel in the world at the time, spanning 3.24 kilometers. Its construction marked a significant advancement in tunnel engineering, employing cutting-edge techniques and materials. The tunnel facilitated unprecedented connectivity, boosting the local economy and mobility across the Mersey. Today, Queensway stands as an enduring symbol of architectural and engineering innovation, integral to the region's infrastructure.

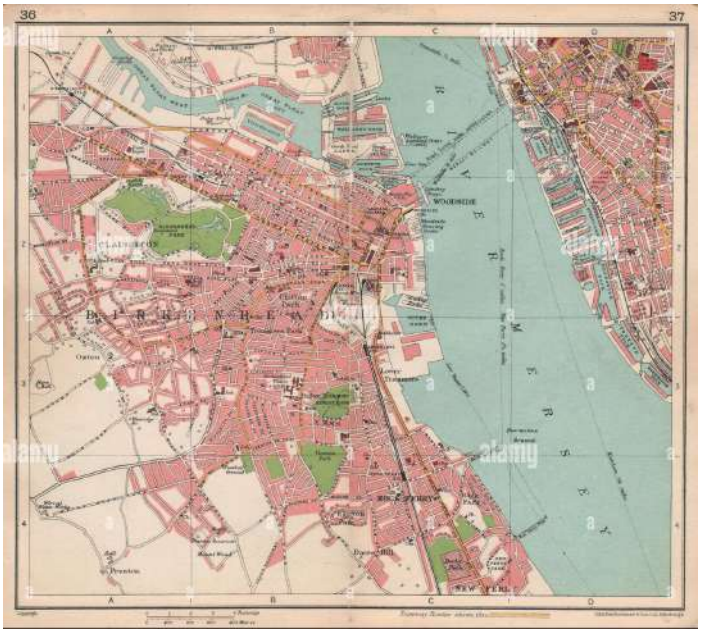
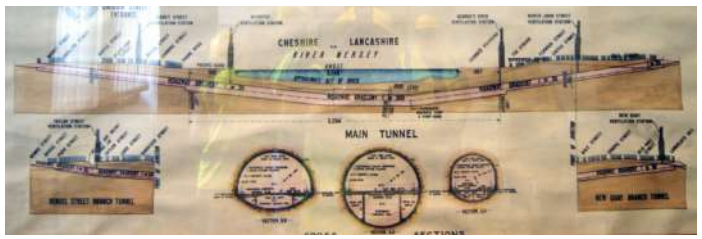
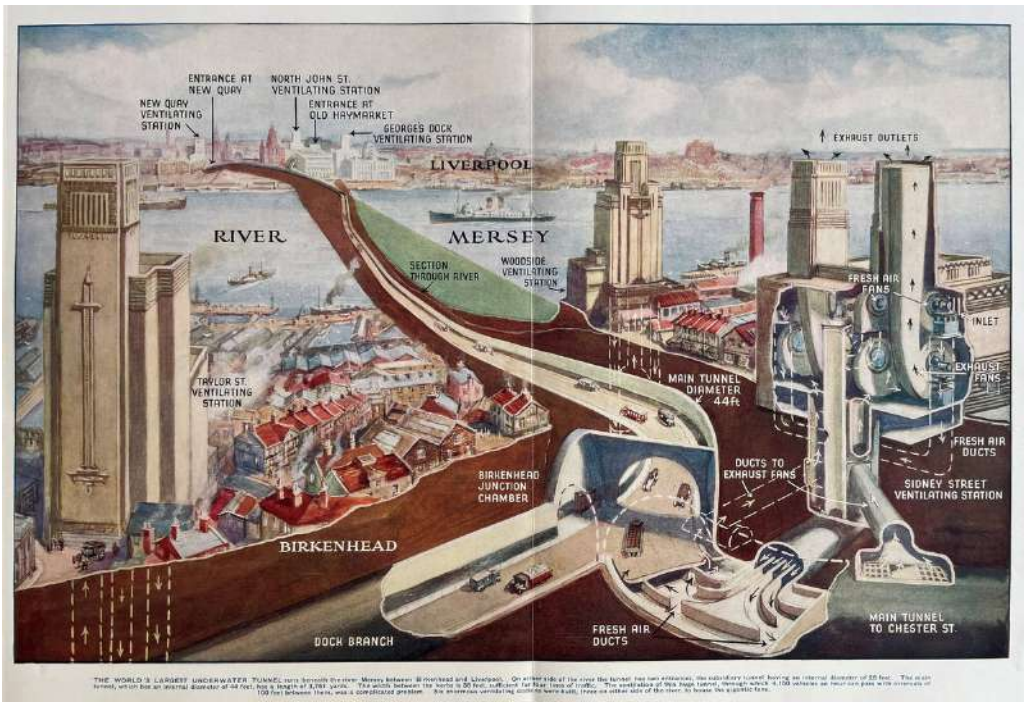


Diagram showing where the tunnel connecting Liverpool to Birkenhead would be, under the River Mersey. Spanning 44ft wide with two desks for vehicles only. Eventually opened by King George V, called 'Queensway', on 18 July 1934, at the time the longest underwater tunnel in the world a title it held for 24 years, with a cost total of £8 million. Date: 1926





Bedrock structural Complexity

LIVERPOOL CITY REGION COMBINED AUTHORITY

METRO MAYOR LIVERPOOL CITY REGION

The tunnel currently has six ventilation shafts, three on each side of the river.

Georges Dock main ventilator, Liverpool

North John Street ventilator, Liverpool

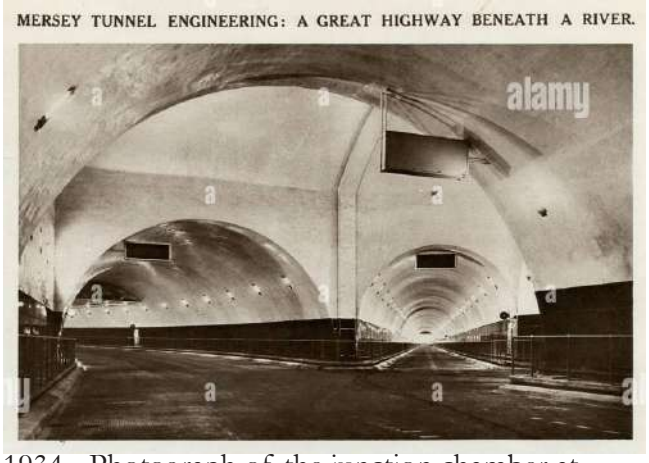
Fazakerley Street ventilator, Liverpool

Sidney Street ventilator, Wirral

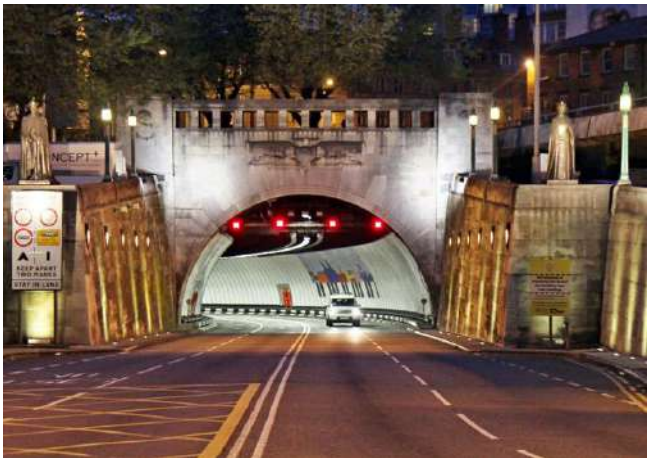
Woodside main ventilator, Wirra

Taylor Street ventilator, WirraL

Mersey Tunnel Opening, Liverpool, 18 July 1934 by King George IV and Queen Mary



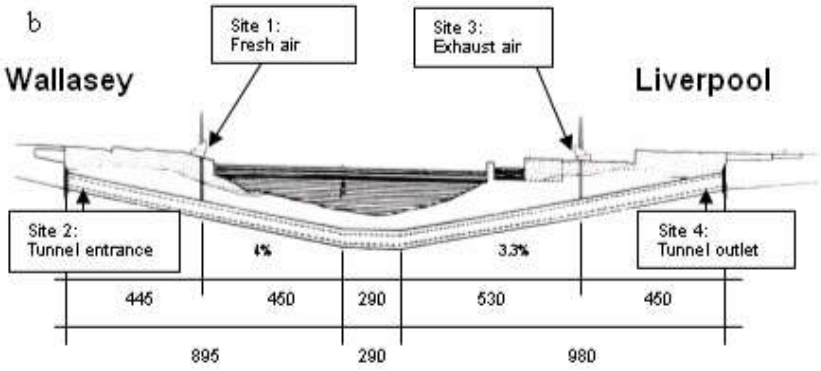
1934 - Photograph of the junction chamber at the Birkenhead end of the newly constructed Queensway or Birkenhead Tunnel (Mersey Tunnel), Liverpool

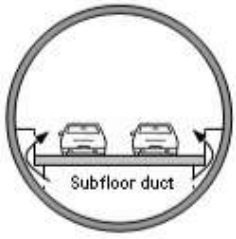


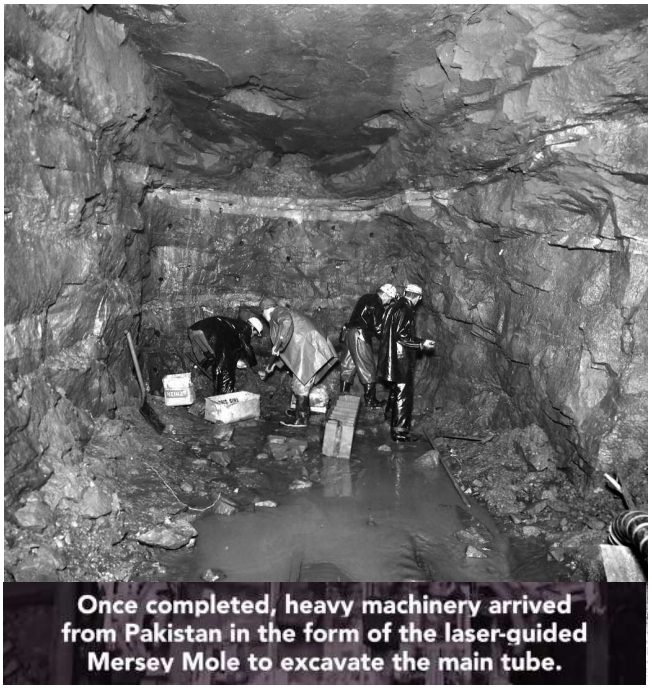
year 2021

tunneling triumphs / Kingsway Tunnel 1968–1973

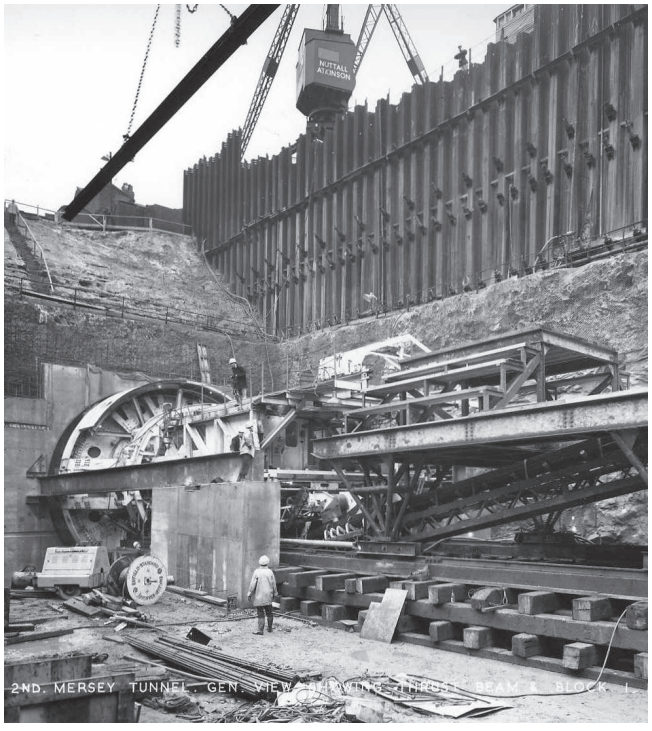
By 1958, the volume of traffic crossing the Mersey was too much for the Birkenhead tunnel to handle alone. A decision was made to build another, to be named the Kingsway, one mile downstream, that would run between Liverpool and Wallasey. It would be another seven years before the Mersey Tunnel Act finally gave authority for the new tunnel in 1965.



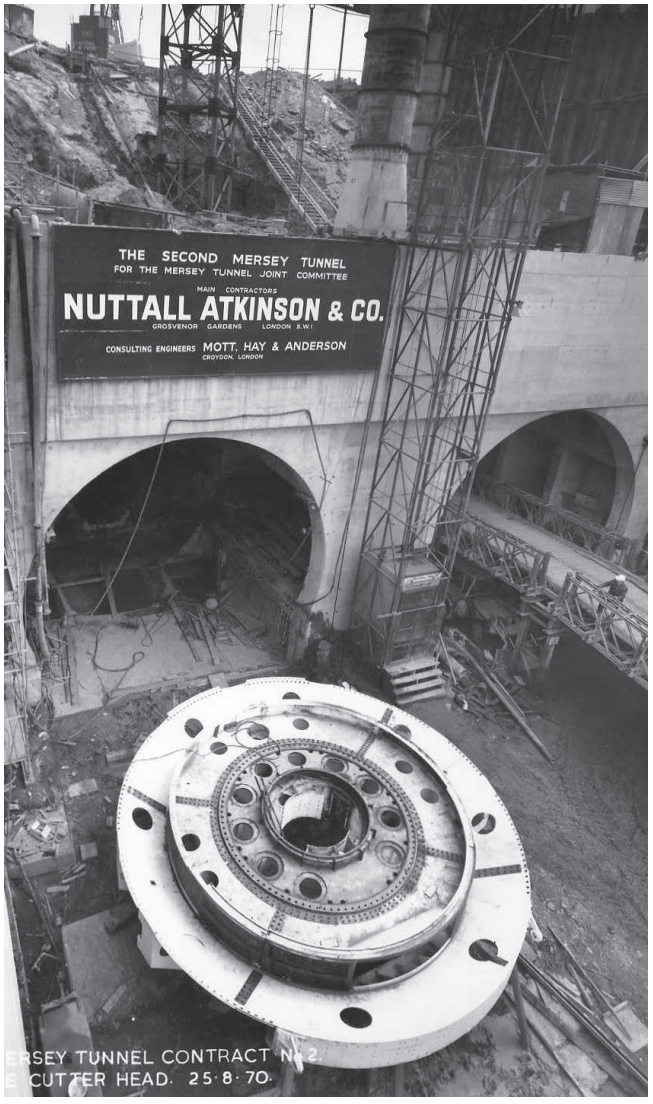


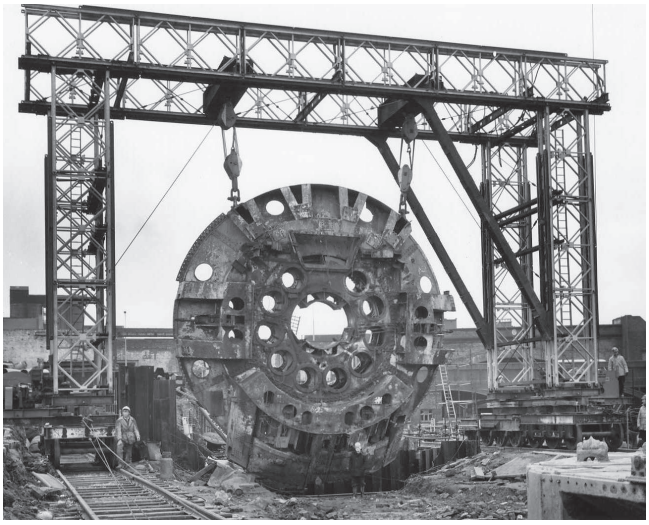


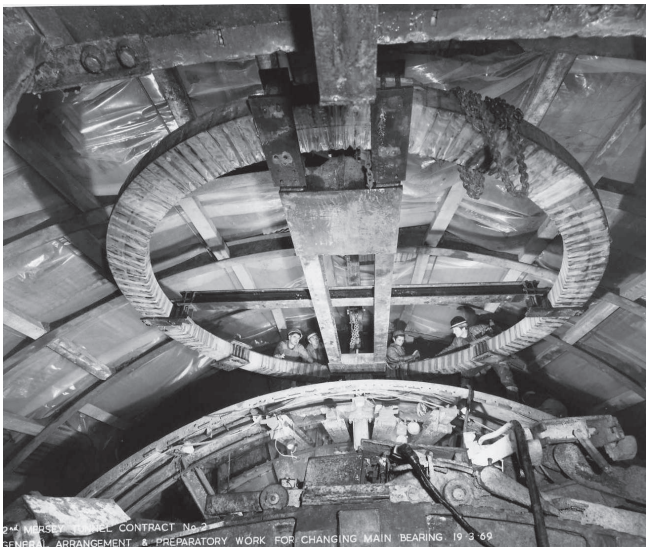
Once completed, heavy machinery arrived from Pakistan in the form of the laser-guided Mersey Mole to excavate the main tube.



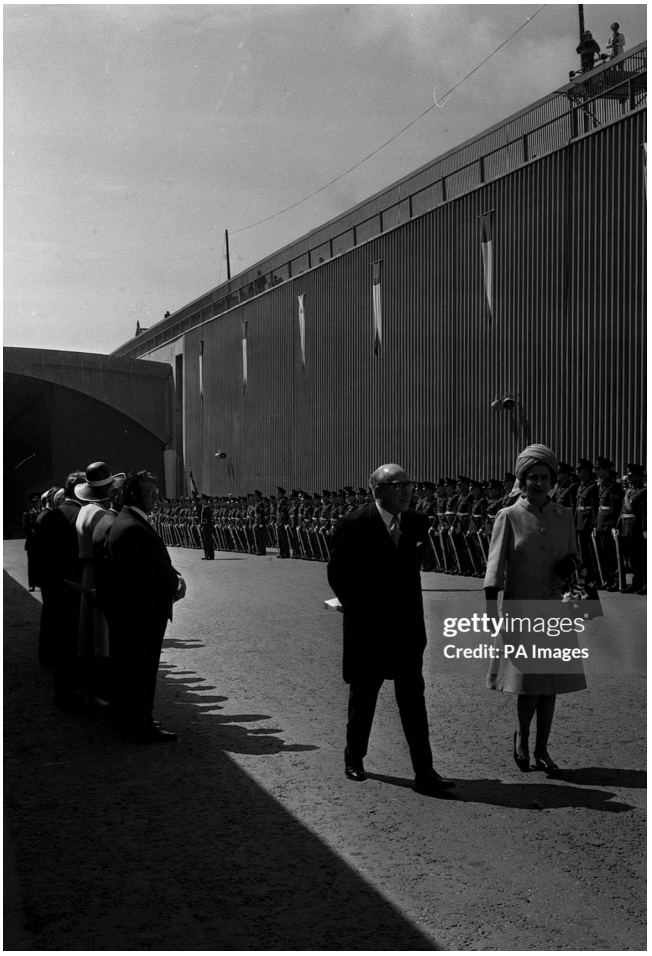
Kingsway Tunnel 1968–1973



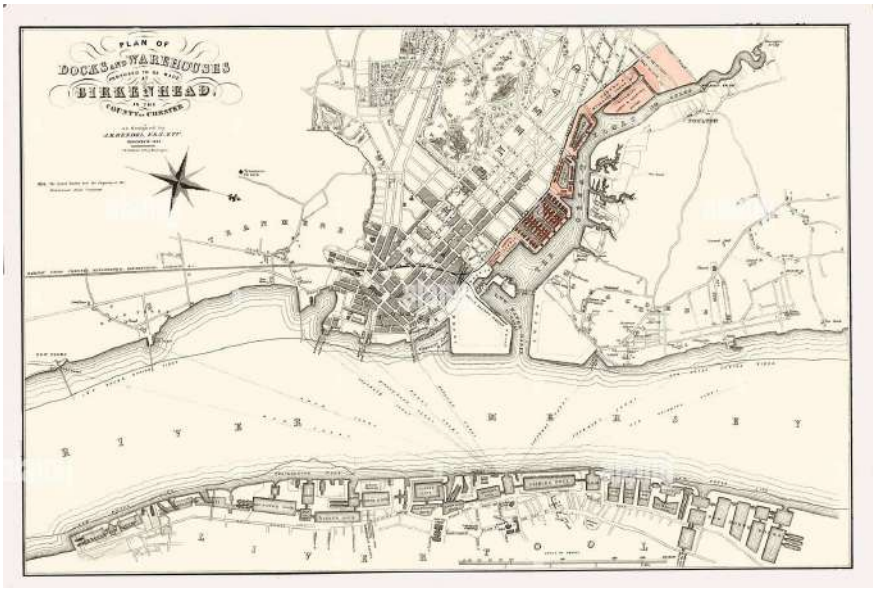




The Queen walking along the approach road to open the second Mersey tunnel, linking Liverpool with Wallasey, She honoured her father, King George VI, by naming the 29 million tunnel 'Kingsway'



The Great Float / 1851 - 1860



Wallasey Pool was a natural tidal inlet of water that separated the towns of Wallasey and Birkenhead on the Wirral Peninsula, England. Originally flowing directly into the River Mersey, it was converted into the sophisticated Birkenhead Dock system from the 1820s onwards by land reclamation, with the main portion of the pool becoming known as the Great Float. In 1933, with the exception of a small lake, the head of Wallasey Pool at Poulton was converted into Bidston Dock.


POULTON
SEACOMBE
BIDSTON
WALLASEY
WEST FLOAT
EAST FLOAT
BIRKENHEAD
WOOD SIDE
TRANMERE
RIVER MERSEY
BIRKENHEAD DOCKS
SCALE
1 ML
RAILWAYS
TUNNELS

1867
New Brighton Pier

1881
Pier extended

1892
Pier pavilion added

1900
Pier extended

1910
Pier refurbished
+ heating

1923
Pier closed

1930
Pier opens
replace buildings + clubhouse

1936
Pier wider
+ booking house

1965
Pier refreshed

1972
Pier closed

1847
Birkenhead Park open

1881 - 1886
Mersey Railway Tunnel open
land reclamation,Birkenhead Park

1903
Mersey Railway adopted electric traction

1926
Closure of Storeton Querries,
Land from Mersey tunnel excavation

1934
Queensway Tunnel

More than 1.2 million tons of rock, gravel, and clay were excavated in digging the tunnel with much of it being used to build Otterspool Promenade in south Liverpool.

1971
Kingsway Tunnel

1974
Kingsway northernmost tunnel

/ geology for better future

/ Conclude for a better future

Life circles: Bidston Moss Park

Bidston Moss has been transformed into a thriving community woodland, located near the area of Bidston in Wirral, Merseyside. Previously, it was a low-lying wetland marsh and later served as a landfill site from 1936 to 1995. Following its closure as a landfill, efforts by the Merseyside Waste Disposal Authority and the charitable trust Groundwork Wirral, among others, have rehabilitated the area into a valuable green space for the community and wildlife.

This transformation is part of broader initiatives to restore and repurpose previously degraded or industrial lands for public use and environmental conservation. Bidston Moss now offers surfaced paths for walking and cycling, providing a green oasis in an urban setting. The area supports a variety of wildlife and serves as an important recreational and ecological site for residents and visitors alike.

The restoration of the Bidston Moss landfill site began with the importation of soil-forming materials, primarily paper pulp mixed with soil from the Bridgewater paper recycling plant in Ellesmere Port. This mixture was spread across the site to support the planting of hundreds of trees and the creation of wildflower meadows and boardwalks, all connected by pathways.

We are ‘urban mining’ and recovering materials for reuse as sites are reclaimed.A key focus is materials with emboddied carbon (materials and historic production and transport to site) and aggregates for reuse in site works.

raised tread construction

grade reversals

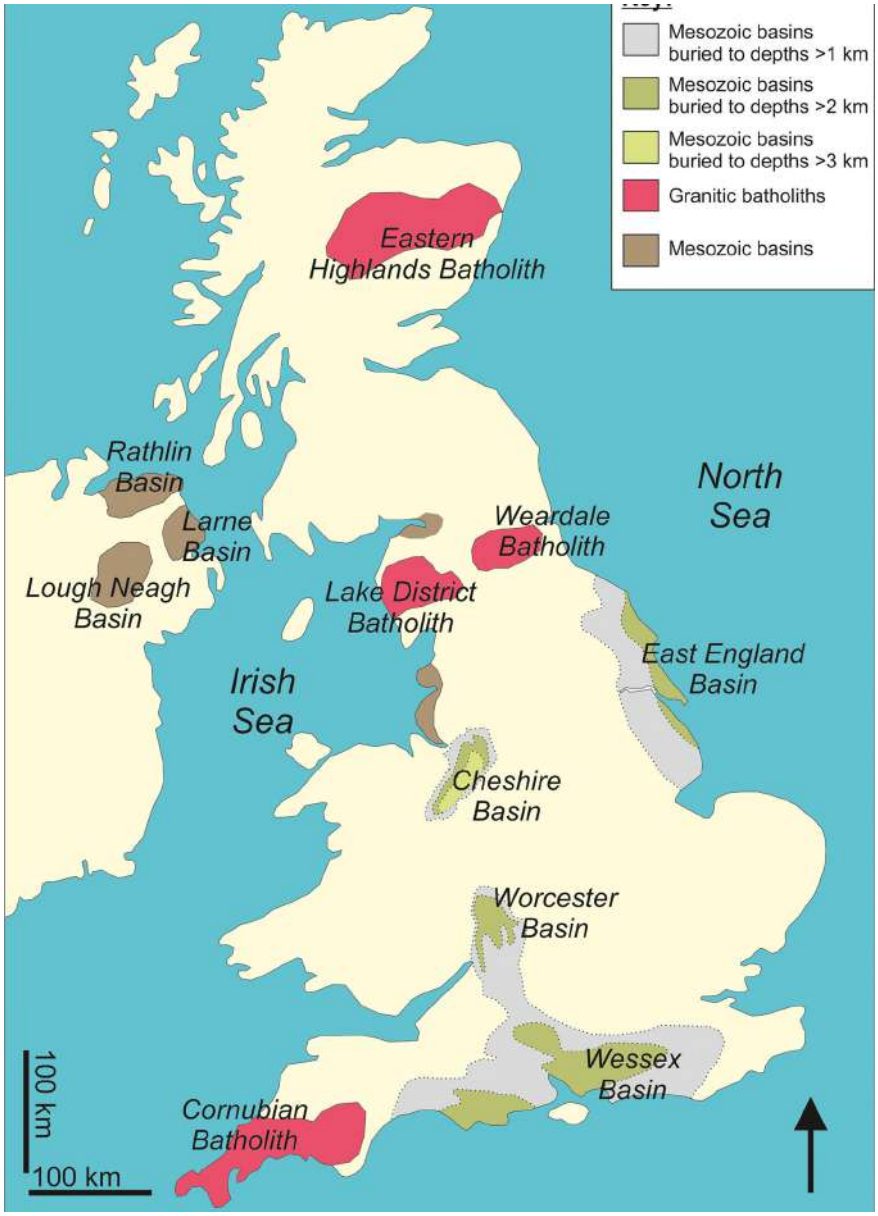
constant ups and downs

twists and turns

rock choke

rock drop

Future is warm



the paper discusses the potential for using the natural heat found deep underground in the Cheshire Basin region of the UK. This geothermal energy could be a significant and sustainable source of heat, helping the UK reduce its greenhouse gas emissions and meet its energy demands. The paper highlights the need for further exploration and investment to unlock this potential.

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UK Low Enthalpy Geothermal Resources: the Cheshire Basin
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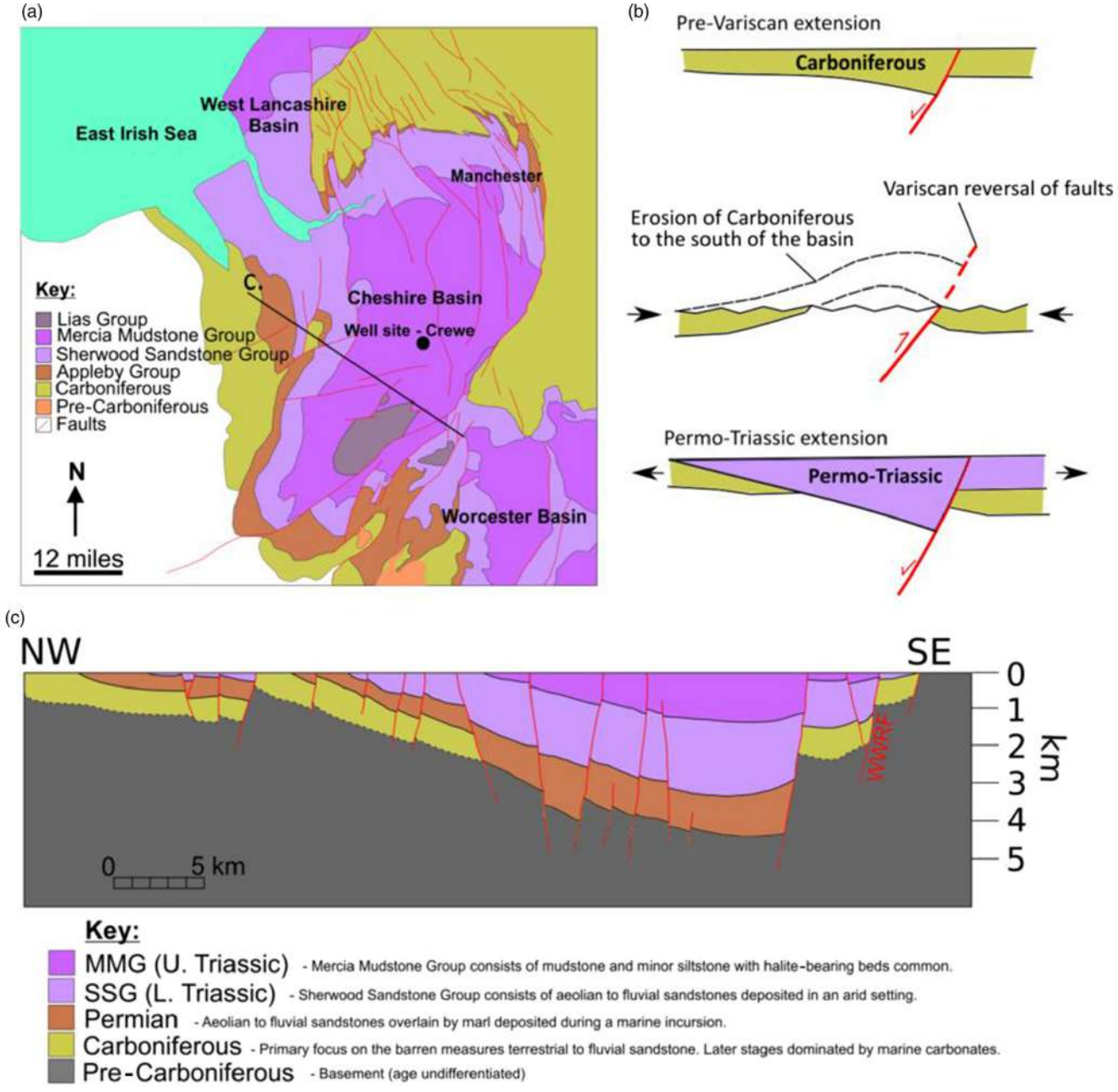

Table 1: Depth and Temperature data for Boreholes in the Cheshire Basin (after Plant et al., 1999)

Prees SJ53SE3		Burford SJ65SW13		Elworth SJ65SW53		Knutsford SJ77NW4	
Temperature °C	Depth mbgl	Temperature °C	Depth mbgl	Temperature °C	Depth mbgl	Temperature °C	Depth mbgl
53	1731	26	668	36	1089	27	715
56	1932	28	751	39	1318	31	909
59	2164	30	837			39	1500
62	2396					43	1803
66	2750					45	2000
70	2889					51	2230

Thank you