



Llywodraeth Cymru
Welsh Government

A494 River Dee Bridge Replacement Scheme

Non-Technical Summary – September 2025



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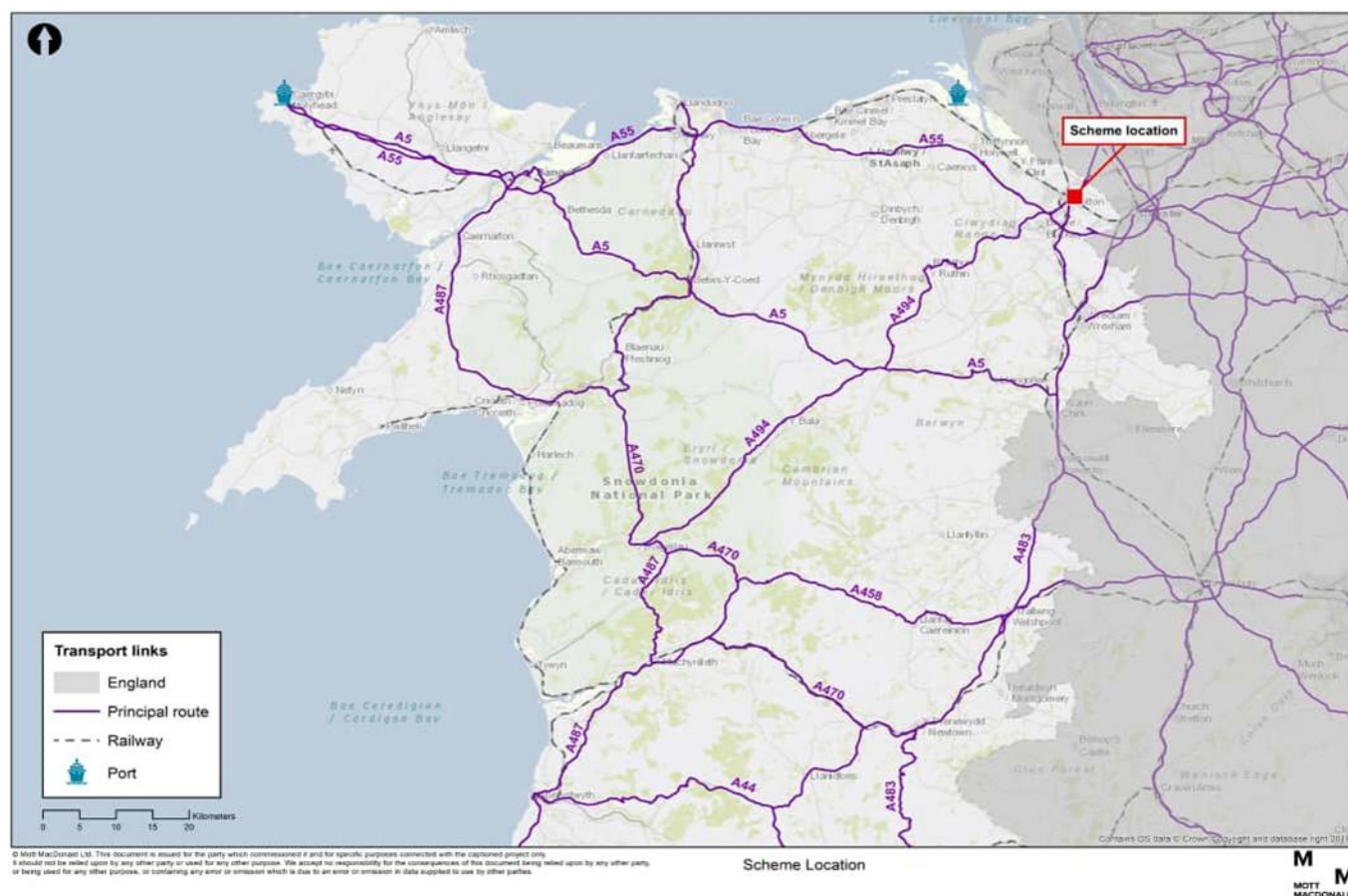
(Cover image source: Mott Macdonald)

1. INTRODUCTION

General

The A494 River Dee Bridge provides a vital connection for cross border traffic between North Wales, the north-west of England and beyond, connecting people, communities and businesses. The bridge is in poor structural condition and needs replacing. The Welsh Ministers propose to renew the existing bridge by constructing a new structure close to the existing while keeping the A494 open to all traffic. Once completed the A494 would then be reconnected to the replacement bridge and the old bridge deck and beams removed leaving the in-river support piers. The proposed scheme is entitled the A494 River Dee Bridge Replacement Scheme (referred to hereafter as the “Scheme”).

The Scheme has been subject to an Environmental Impact Assessment (EIA), in accordance with the Highways Act 1980 (as amended) and The Environmental Impact Assessment (Miscellaneous Amendments Relating to Harbours, Highways and Transport) Regulations 2017 (EIA Regulations 2017).



The Environmental Statement (ES), consisting of a Technical Assessment Report, Figures and Technical Appendices that cover the completed EIA, ensures that all those with an interest in the Scheme, understand the proposals and are given an opportunity to express an opinion on them before the Welsh Ministers decide whether to confirm the Highway and Compulsory Purchase Orders for the Scheme.

This document is the Non-Technical Summary (NTS) of the ES. It describes the Scheme and provides an overview of the findings of the EIA process using non-technical language. The draft Statutory Orders for the Scheme, which set out the areas of land that would be required to build, mitigate and maintain the Scheme, are:

- The Welsh Ministers (The Dolgellau To South Of Birkenhead Trunk Road (A494) (Queensferry Interchange To Garden City Improvement))
Compulsory Purchase Order 202-
- The Dolgellau To South Of Birkenhead Trunk Road (A494)
(River Dee Bridge Replacement) Order 202-
- The Dolgellau To South Of Birkenhead Trunk Road (A494) (Queensferry Interchange To Garden City Improvement) (Side Roads) Order 202-

Background and the Need for the Scheme

Bridge inspections have recorded evidence of concrete deck deterioration which has continued despite routine maintenance and repairs. If nothing is done, the structure will continue to deteriorate, and weight restrictions and/or lane closures may need to be introduced to maintain the A494 River Dee Bridge in the short to medium term and may need to be closed in the long term.

The existing bridge carries approximately 68,400 vehicles per day (2024). Any long road closures required for replacing deteriorated parts would result in severe disruption and delays to journeys for bridge users and those using the local road network.

After considering a number of options, the Welsh Ministers propose a scheme to construct a new bridge upriver of the existing crossing. The existing bridge would be demolished, except for the in-river support piers which would remain. The new bridge would carry a dual two-lane urban highway, a shared use path for pedestrians and cyclists, and a maintenance access route. The shared use path would run along the south-eastern side of the bridge and continue the full length of the Scheme, connecting with the existing trunk road, cycle track and National

Cycle Network routes. The completed project would provide approximately 1.2 km of improved highway.

The new structure and much of the highway will be constructed offline to minimise disruption to road users. Once complete, traffic will be diverted to the new bridge, allowing removal of the existing structure.

2. THE SCHEME

Overall Aims

A wide range of legislation and policies have been considered during development of the Scheme including the Well-being and Future Generations (Wales) Act 2015, the Environment (Wales) Act 2016, Active Travel (Wales) Act 2013 and the Flintshire Local Development Plan 2015 – 2030.

The proposals support the direction and policy objectives of the Welsh Government as set out in Future Wales – The National Plan 2040 (2021), Llwybr Newydd – The Wales Transport Strategy 2021 (2021), Llwybr Newydd i Natur – the Nature Recovery Action Plan for our Strategic Road Network (2023), and the National Transport Delivery Plan 2022 to 2027 (2023).

Scheme Specific Objectives

The Scheme has been designed to meet specific objectives developed in consultation with stakeholders and adopted by Welsh Government. These are to:

- Maintain connectivity of the A494 strategic corridor by addressing the life expired River Dee Bridge.
- Maximise opportunities for modal shift through better provision for alternative modes.
- Minimise scheme whole-life carbon emissions through applying carbon reduction measures to design, construction, and operation.
- Maintain and enhance the local environment by securing long term net benefit for biodiversity.
- Improve resilience on the A494 corridor by minimising the impacts of incidents and accidents and enhancing safety for road users and maintenance personnel.
- Maintain connectivity along the A494 strategic corridor during construction to minimise impacts on residents, businesses, strategic and local traffic.



Figure 2: Aerial photograph of River Dee and Bascule Bridges looking upriver towards Broughton (Source: Mott Macdonald)

Proposed A494 River Dee Bridge Replacement

The Project consists of the following key features:

- A new bridge to replace the existing bridge that is in a poor and deteriorating condition.
- A new shared use path for pedestrians and cyclists running along the southeast side of the westbound carriageway. This would connect to the Wales Coast Path and other active travel routes in the area.
- Improvements to the existing A494 to the east of where the road passes under the North Wales Coast Railway Line. This would include introducing a new hard shoulder in each direction connecting to the existing hard shoulders to the east of the River Dee, alignment improvements and sustainable drainage systems.
- A new replacement junction (left in and left out only) south of the river connecting the Riverside area with the A494 in a similar form to present.
- Diversion of the Queensferry Drain (a Natural Resources Wales main river), in new sections of open channel provided either side of the railway with a section of existing culvert beneath the railway line being retained. The new open channels will benefit from dedicated maintenance access tracks alongside the new sections.
- A new river pumping station and drainage outfall to the River Dee.
- Environmental mitigation and biodiversity enhancement works with earthworks and areas of soft estate including wildflower verges, swales and native woodland plantations.
- Removal of the existing A494 River Dee bridge deck and beams.
- Existing river bridge piers retained in-situ to reduce carbon, remove the risk of working in the river and avoid disturbance of the marine environment.

Demolition of Existing Features

The following properties would be demolished as part of the Scheme:

- Haulage business workshop, building and yard situated immediately south-east of the existing A494 and on the west bank of the River Dee.
- NRW river pumping station and Scottish Power Energy Networks (SPEN) electricity sub-station (within the same compound), situated to the north-east of the existing Riverside Way junction.
- Old Flintshire Council Depot and storage yard on Chester Road East, next to the railway line.

- Vacant residential properties, known as 1 – 4 Bridge Houses, located on Chester Road East, about 200 m east of the Queensferry Interchange junction.
- Auto-motive garages and derelict old business units on Chester Road East (formerly Queensferry Autos).

There are several utilities in the area which would be affected by the Scheme. All utility owners and operators have been consulted to establish how their equipment would be affected by the Scheme and to allow them to plan any diversions required.

- Pressurised rising mains
- 33kV electricity cables
- Queensferry Drain
- Existing NRW pump station and secondary sub-stations

Long Term Management

The completed A494 carriageways, along with sections of shared use paths, will be owned and maintained by the Welsh Government. After construction there would be up to a five-year aftercare period in which the Contractor would maintain and ensure the establishment of the landscape and ecological elements of the Scheme. Following completion of the aftercare period, the highway's soft estate would be maintained in the long-term by the North and Mid Wales Trunk Road Agent (NMWTRA) on behalf of the Welsh Government.

The new access road to the Riverside area, as well as certain sections of shared use paths would be maintained by the local highway authority, Flintshire County Council.

3. SCHEME CONSTRUCTION

Construction Phase

The construction phase, including the removal of the existing bridge deck and beams is subject to the programme for major utilities diversions but is expected to last for approximately 2 to 3 years. The construction activities and programme could be changed during both the detailed design and the construction phases.

Sequence of Construction Activities

The Scheme construction activities would be typical of a major road scheme, using a phased approach to shorten the construction period:

- Enabling works - preparatory activities likely to be undertaken in advance of construction.
- Establishment of construction site compounds, delineation of works areas and access arrangements, including demolition of buildings and vegetation clearance.
- Construction of temporary shared use paths for diversion routes needed during the construction period
- Demolition of buildings and vegetation clearance to accommodate utility diversion.
- Diversion of Queensferry Drain watercourse.
- Earthworks to form the replacement bridge approach embankments.
- Installation of replacement bridge and carriageway tie-ins with existing road.
- Demolition and removal of existing bridge deck, beams and abutments.

Temporary Land Requirements

In order to carry out the construction it is essential that land is acquired for the duration of the works, to provide site compounds (including offices, stores, and car parking), construction working areas (including for temporary works and haul routes), and areas for material storage, plant and machinery. Temporary diversion of some shared use routes would also be required during the construction period.

Traffic Management

Traffic management and restrictions would be used to provide safe access and working areas for the construction workforce and their vehicles, plant and equipment, and to permit safe passage through the works and on adjacent routes. Management would include separating works areas from public access areas, speed restrictions and lane or full closures of certain roads for short durations.

Working Hours

The majority of construction works would normally take place between 07:00 - 19:00 Monday to Friday and 07:00 to 13:00 on Saturday. There may be exceptions to these hours for oversize deliveries and junction tie-ins etc. or for traffic management reasons. Due to traffic management restrictions, safety and operational constraints, some operations would need to be carried out at night. Any working outside the normal hours would be agreed with the relevant authorities and residents would be informed in advance.

Environmental Management

The ES sets out the potential environmental effects of the scheme and proposes measures to avoid, compensate or mitigate for any adverse effects. Each measure is described in a Register of Environmental Actions and Commitments (REAC), as means of ensuring that the measures are understood and implemented appropriately. The REAC forms part of a construction stage Environmental Management Plan (CEMP). Both the REAC and the CEMP would be developed by the Contractor to guide construction activity and to ensure that the Scheme is completed in accordance with the design, current legislation and best practice. The REAC would be reviewed and updated throughout the construction and aftercare phases to include evidence that the work is properly completed, monitored to test effectiveness, and maintained correctly.



Figure 3: Visualisation of the proposed Scheme looking west towards Shotton and Queensferry
(Source: Mott Macdonald)

4. ALTERNATIVES CONSIDERED

Alternatives to a Replacement Bridge

The Welsh Transport Appraisal Guidance (WeITAG) Stage 1 presents the strategic case for replacing the A494 River Dee Bridge under the Welsh Government's Programme, emphasizing its importance to local and regional economies in North Wales. An initial longlist of intervention options was identified and then appraised on how they meet the Scheme objectives and design, engineering, wellbeing, and environmental considerations. In addition, they were tested on how they contribute towards the objectives of the Wales Transport Strategy.

The River Dee is ecologically significant and crossing it is crucial for connecting North Wales with northern England and accessing the Anglesey Freeport. From the longlist of initial option appraisals, a shortlist of the best performing options were reviewed in greater detail with the 5 best performing options selected and taken forward to public consultation.

Scheme Design Alternatives

The five best performing potential options that passed through the key road building tests formed the basis for further appraisal against the Scheme objectives. The short-listed options were selected as the following option packages:

- **Option B** - New twin structure River Dee Bridge plus active travel link within existing rail underbridge.
- **Option C** - New twin structure River Dee Bridge plus separate rail underbridge for active travel.
- **Option D** - New off-line single structure River Dee Bridge plus new westbound rail underbridge.
- **Option E** - New off-line single structure River Dee Bridge plus active travel link within existing rail underbridge.
- **Option F** - New off-line single structure River Dee Bridge plus separate rail underbridge for active travel.

The five options showed a similar alignment and land take due to their connection to the A494 and bridge span. Each option featured two traffic lanes in both directions, with little expected effect on traffic flow or carbon emissions. However, the construction phase is likely to result in some negative carbon impacts, particularly for the twin-span designs. Twin span options would

require more extensive work within the river, leading to greater environmental risks, while single span options could improve saltmarsh recovery by removing the existing bridge.

Analysis of the options in WelTAG Stage 2 recommended constructing a new bridge offline with an active travel link beside the westbound carriageway and through the existing railway portal. Option E stood out in transport and wellbeing criteria from Welsh Government policies, including the Wales Transport Strategy and the Well-being of Future Generations (Wales) Act 2015, as it is more affordable, environmentally friendly, and practical for delivery.



Figure 4: Visualisation of the proposed Scheme looking east towards Garden City
(Source: Mott Macdonald)

5. APPROACH TO ENVIRONMENTAL ASSESSMENT

Screening and Scoping

Screening and Scoping Reports were prepared to determine whether a statutory EIA was required, and what environmental topics the assessment should include. The Scoping Report was issued in December 2024 to statutory consultees and representatives of organisations that attend the Environmental Liaison Group (ELG) meetings, which include:

- Welsh Government.
- North and Mid Wales Trunk Road Agent (NMWTRA).
- Natural Resources Wales (NRW).
- Flintshire County Council.
- Heneb (The Trust for Welsh Archaeology) on behalf of Cadw.

ELG meetings were held with key environmental consultees and stakeholders during the evolution of the Scheme design and the assessment process.

Comments received helped decide the scope for the ES, including the amount of survey work required for the assessments. The scope of the ES has considered legislative requirements, the nature, size and location of the Scheme and the consultation responses provided.

Consultation

Consultations were conducted with various organisations, including statutory and non-statutory consultees, interest groups, and local community members, particularly from Queensferry and nearby areas. Key stakeholders with significant interests in transport-related economic, environmental, and social issues in north-east Wales participated in Stakeholder Workshops and additional direct consultations.

Public consultation took place over 12 weeks from the 9 December 2024. Stakeholders demonstrated strong support for replacing the A494 River Dee Bridge as soon as possible. There was support for Option E as a solution which would minimise impacts during construction, provide noise screening for residents, new green spaces for amenity and biodiversity and active travel connections across the River Dee. Option E was confirmed as the Preferred Option by the Cabinet Secretary for Transport and North Wales on 6 June 2025.

Approach to EIA

The EIA assesses the anticipated environmental effects that could arise as result of the Scheme during both construction and operational stages. The effects can be either adverse or beneficial and have been considered in accordance with the relevant EIA legislation and guidance.

The existing and likely future environmental conditions without the Scheme have been identified. These are known as ‘baseline conditions.’ The likely effects of the Scheme can then be identified by comparison with the baseline conditions. The designers use EIA to consider potential environmental effects and where practicable, to change the design to avoid, reduce or prevent adverse effects from arising. In some cases, mitigation measures or enhancements are provided.

The effects are described based on an agreed scale ranging from ‘Very Large’ to ‘Moderate’ which means they should be taken into consideration as part of the decision-making process; through to ‘Slight’ which means the effects is not considered material, while ‘Neutral’ indicates that there is no effect. In Environmental Impact Assessment legislation and guidance any effect ‘Moderate’ or greater is considered to be ‘Significant’ and reported in the ES.

6. ENVIRONMENTAL SPECIALIST ASSESSMENTS

Introduction

The assessment of likely effects of the proposed Scheme has taken account the design, construction processes and controls and further mitigation which could be applied to avoid or mitigate the possible impact of the work. The Register of Environmental Commitments (REAC) within the Environmental Statement records these items.

Geology and Soils

The surface geology is characterized by fine-grained, organic-rich sediments from tidal and River Dee deposits overlying glacial deposits, with sedimentary bedrock beneath, including coal measures. Although the area is within an opencast coal resource region, there are no coal seams present in the surrounding area.

There is potential for ground contamination due to historical activities on land to the south-west of the River Dee and south-east of the A494. Construction of the Scheme could have the beneficial effect of removing or remediating contamination. Adverse effects during construction could include soil deterioration, disturbance of contaminated ground, contamination of

watercourses, loss of agricultural land, pollution of ground and surface water by accidental spills.

Mitigation of these would include using good industry practice measures to prevent spreading contamination and protecting damage to vulnerable soils and controlled waters. With the proposed mitigation measures in place, the Scheme would have no significant adverse effects.



Figure 5: View downriver from River Dee embankment towards River Dee Bridge and A494
(Source: Richards, Moorehead & Laing)

Road Drainage and Water Environment

The local area, comprising industrial, commercial, residential, and rural land uses, features low-lying coastal terrain with Main Rivers, including the tidal River Dee and Queensferry Drain. Due to the significant fluctuations in tidal levels, particularly during Spring and Neap tides, the Queensferry Drain, which serves the drainage needs of the A494, depends on a pumping station to prevent tidal backflow and maintain efficient water management. The existing highway drainage discharges untreated water into the Queensferry Drain, while Sealand's drainage flows to a swale connected to the Garden City Drain and River Dee.

NRW's Flood Map for Planning shows a risk of surface water flooding at low points along the A494, particularly at the highway's low point where it passes beneath the Chester and Holyhead Railway in Queensferry and the Foxes Lane culvert in Sealand. A detailed Flood Consequences Assessment was undertaken to identify the acceptability of flooding consequences. The proposed operations are expected to have neutral or minor impacts on flood risks from the River Dee and Queensferry Drain for commercial receptors, while residential, transport, and agricultural areas may experience slight benefits. Overall, these effects on flood risk are not seen as significant.

During construction there is potential risk to surface water quality by accidental release of construction materials to groundwater by dewatering activities and disturbance from piling, and to riverbanks and channels by erosion or scouring. Construction activities would incorporate industry best practices pollution prevention and control measures. The bridge design would align with the existing bridge piers to reduce disturbance to the flow of water in the River Dee, a jack-up barge would be used to eliminate the need for dredging and piles would be bored to construct the foundations for the bridge. With these mitigation measures in place, there would be no significant adverse effect during construction.

Surface water would be collected and directed into drainage swales to provide sediment control and with penstocks to provide water attenuation, before discharging into Queensferry Drain or Garden City Drain and then into the River Dee. A section of culverted Queensferry Drain to the west of the railway line would be realigned within an open channel and provide attenuation for the existing highway surface water drainage system.

Terrestrial Biodiversity

Surveys and desk study between 2018 and 2025 have identified the presence of bats and badgers, as well as habitats likely to support species of amphibians, birds, and other mammals. Within 1 km there are sites critical for wintering, breeding and migratory bird populations.

The main terrestrial habitats, include broadleaved and mixed plantations, dense and scattered scrub, grassland, improved grassland, disturbed ground, water with marginal vegetation, species-poor hedgerows, arable land and built-up areas.

The design of the Scheme includes measures to mitigate adverse effects on wildlife. Reasonable Avoidance Measures and the requirements of derogation licenses would be implemented with oversight from an ecologist. Measures would include vegetation clearance outside the bird nesting season and careful cutting of ground vegetation to displace mobile

species. Green corridors and retained habitats would be protected and an ecologist would supervise the de-watering of the Queensferry Drain. Demolition of bat-occupied buildings would be scheduled to avoid winter hibernation periods.

Planting linear habitats like hedgerows and tree belts would encourage movement of species and the design of lighting would minimize light spill to meet the needs of safety while reducing light trespass. To compensate for the loss of pipistrelle bat roosts, new roosts would be established near to existing habitats. Shaded corridors would be provided by hedges and trees to help species like bats move through the area.

Saltmarsh and intertidal habitat beneath the replacement bridge would be lost due to potential disturbance during construction and its permanent placement in shade. The habitat loss would be fully compensated by works to enhance the saltmarsh at a site near Greenfield. The residual effect on this feature of the Site of Special Scientific Interest would then be large beneficial.

Adverse residual effect on all other terrestrial ecological receptors considered in the assessment would be mitigated to neutralise the effect.



Figure 6: Aerial photograph of Greenfield Marsh site of proposed salt marsh enhancement (Source: Mott Macdonald)

Landscape and Visual

The landscape character of the study area overlaps designated areas which reflect the importance of the River Dee, the Dee Estuary and the coastal slopes for their ecological and cultural value.

The study area features lowland foothills and slopes falling to the River Dee, which flows into a broad estuary with tidal sand and mud flats. Beside the river the low-lying floodplain comprises of a mix of pasture, arable land, and farm woodlands. The central part of the area is densely populated with urban settlements, characterised by current and former industry, which have merged into settlements like Connah's Quay. The wider landscape includes significant structures such as the Broughton Aircraft Factory, Shotton Steelworks, and Connah's Quay Power Station.

The canalised River Dee landscape is predicted to experience a significant adverse and short-term effect caused by disruption during the construction period. During operation, in the medium-term, the significant adverse effect is predicted to gradually reduce as new mitigation planting grows and integrates the approaches to the bridge into the localised landscape.

Residential properties next to the Scheme boundary or close to the Dee Bridge are predicted to experience a significant adverse effect during construction. Users of the Wales Coast Path are predicted to experience a significant adverse effect during operation but gradually improving as mitigation planting matures. Some dwellings assessed on Foxes Lane, Claremont Avenue and Riverside Way are predicted to experience a significant adverse effect when the Scheme is opened to traffic, but it is predicted that significant adverse effects would be reduced as planting matures to integrate or screen the view of structures and traffic, with long-term effects assessed as being slight adverse and not significant.

Archaeology and Cultural Heritage

The Scheme lies within the parish of Hawarden and the assessment includes all known historic assets in the local area within 500 m on either side of the Scheme, and designated sites, such as listed buildings and scheduled monuments, in a 5 km wide zone. Most assets date from the last two hundred years in the local area but a range of much older sites in the wider area date back to the Roman period.

Many of the heritage assets are associated with former industries located along the banks of the River Dee. Built heritage assets associated with the shipyard remains of Aston Quay (SJ 3234 6851) such as a railway, a weighbridge, a quay building and a chapel have been previously

demolished or are located under the existing A494 embankment on the Queensferry side of the River Dee. Other surviving non-designated assets around the Aston Quay inlet including the remains of 3 timber landing stages and the quay itself would be significantly adversely impacted during construction. The most appropriate mitigation for these assets is to record any findings as works progress.

Predicted effects on designated assets near to the Scheme are not considered to be significant. The Bascule Bridge (SJ 3218 6864) and Ferrybank Farm (SJ 3284 6875) would experience a limited effect on the visual setting but would not be affected by noise and vibration caused by the construction of the Scheme.

Air Quality

There are no Air Quality Management Areas (AQMAs) currently declared by Flintshire County Council and there are none elsewhere that are likely to be significantly affected by the Scheme. The nearest AQMA in Chester City Centre, is located about 7.5 km from the Scheme. The Scheme is not likely to cause a significant effect on air quality in the Chester City Centre AQMA.

There are 13 sites within 1 km of the Scheme where Flintshire County Council monitor the concentrations of the pollutant Nitrogen dioxide (NO₂) in the air. From 2019 to 2023 the concentrations were well within the air quality objective levels. Additional monitoring was carried along the Scheme alignment and surrounding area in 2024. No exceedances of the air quality objective concentration levels were recorded.

Pollutant concentrations of nitrogen dioxide and particulate matters (tiny solid or liquid particles suspended in the air, which can be harmful to health when inhaled), are predicted to decrease in the future, due to the uptake of cleaner vehicles and technologies. It is considered that air quality conditions in the vicinity of the Scheme are likely to improve and continue to meet the air quality objectives in future years.

Construction works would be carried out in accordance with the best practicable means to reduce fumes or emissions which may impact upon air quality. To prevent significant adverse effects during the construction phase, material stockpiles would be covered or located in sheltered areas. Construction vehicles would travel slowly with their loads covered or enclosed. During dry conditions, surfaces would be damped down with water.

No significant effects on air quality are predicted, as there are no adverse impacts in areas where air quality objectives are already being exceeded or where the Scheme would cause an exceedance.

Noise and Vibration

The A494 is the main source of noise for nearby receptors in suburban, rural, commercial, and industrial areas, including sensitive receptors such as the Riverside gypsy and traveller site, Sealand Primary School, and the Queensferry Campus, and nearby residential receptors at Queen Street and Dundas Street in Queensferry, and Claremont Avenue in Garden City. For receptors further from the A494, traffic noise from B5441 Welsh Road and B5129 Chester Road East predominates.

Noise and vibration from construction will be managed according to British Standards, focusing on reducing noise at the source. Temporary barriers may be installed to lower noise levels. The CEMP would outline how these effects would be addressed and efforts would be made to shorten the duration of high-noise activities.

In river working needed for the installation of the bridge piles and casings would be restricted to avoid night-time working and limited to the use of quieter piling techniques such as rotary bored and pressed-in piling methods. Percussive piling that is a particularly loud activity would not be permitted. This is to mitigate the risk of disturbance to migratory fish and minimise potential noise and vibration effects on local residents.

There are existing roadside noise barriers on the eastbound side of the A494 and these will be retained. Noise modelling indicates that additional barriers are needed on the westbound side. For the Riverside gypsy and traveller site the reduced distance to the A494 would require the installation of a noise barrier to mitigate against increase in noise levels. A low noise surface would be applied to a section of the proposed carriageway between the railway and Queensferry Interchange to mitigate the traffic noise during the operation phase. It is expected that this would reduce noise levels caused by traffic but this has not been quantified within the noise model.

Material Assets and Waste

Material assets include both recycled and newly manufactured construction materials, such as concrete, steel, and aggregates. The assessment evaluates the areas for use, reuse, or recycling of these materials and the likely sourcing locations – aggregates and in-situ concrete from north-east Wales and steel and pre-cast concrete from across the UK. Aggregate-based products would form the majority of the materials required for the construction of the Scheme. Flintshire produces large quantities of primary and secondary aggregate, more than 50% could be sourced locally.

Waste is any substance or object intended for disposal, including demolition and construction waste, excavated materials unsuitable for recycling, and potentially contaminated materials. The Scheme aims to minimise waste through efficient use of imported materials and re-use, or recycling of materials won on site from demolition and excavation.

The likely effects of the proposed Scheme on material assets and waste management are considered to not be significant.

Population and Human Health

The Scheme would involve demolishing commercial and vacant residential properties and permanently acquiring agricultural land. While no road closures are expected, modifications to the road layout could affect journey times, access and some community severance. Temporary footpath diversions may also alter accessibility. Increased heavy goods vehicle and construction traffic, along with workers on-site, could disrupt community amenities, causing noise, vibration, changes to air quality and visual disturbances for nearby residents. Traffic increases on the local highway network may hinder access to healthcare, community, recreational, educational facilities, and open spaces.

During construction of the Scheme there is likely to be disruption to local residents and their general amenity caused by construction activities such as movement of plant and machinery. Mitigation of these would include using good industry practice measures to prevent adverse impact caused by additional traffic, noise, air pollution, severance and changes to views.

The completed Scheme would improve accessibility and connections to the National Cycle Network and public footpath network and enhance access to green spaces and recreation while promoting physical activity. By reducing severance along active travel routes, it would decrease isolation, encourage non-traffic route use, and positively affect residents' physical and mental health. Improved infrastructure for active travel will lower pollution and enhance access to employment sites and community facilities benefiting public health. No significant harmful effects on human health of residents of the nearby properties is predicted during the operation of the Scheme.

Climate Change and Greenhouse Gases

The Scheme is well-aligned with Wales and UK Government policies for transport and carbon reduction with strategies applied to reduce carbon and minimise emissions during its full lifecycle while maintaining current road capacity. While construction, changes to land use and

emissions from vehicles are expected to cause some increase in emissions, the total lifetime carbon emissions are not substantial enough to hinder the achievement of net zero goals set by Welsh Government.

The commitment to low-carbon practices during the design development phase include selecting a single bridge design, designing out carbon-heavy cofferdam structures, and the implementation of minimally disruptive construction methods. The key control measures include retaining the 50mph speed limit during the operational phase which reduces long-term emissions.

Improvements to active travel infrastructure that promote a shift in transportation modes, aim to support national decarbonisation goals. A carbon assessment, which includes greenhouse gases, is planned after construction to evaluate progress in reducing emissions.

The Scheme is not expected to have a significant vulnerability to climate change. Although there is a possibility that climate change could negatively impact the Scheme during its operational lifespan, the built-in mitigation strategies such as providing resilience in the proposed structures to extreme weather events like high winds, heavy rain and flooding or extreme heat, reduce the significance of any potential climate-related effects.

The Scheme demonstrates a strong alignment with Welsh and UK transport policy and has incorporated a range of embedded carbon reduction measures to minimise emissions throughout its lifecycle. While an increase in emissions is anticipated due to construction, land use change, and operational emissions, overall whole life carbon emissions are not significant enough to affect net zero objectives.

Marine Environment

The River Dee and Dee Estuary have statutory protection for nature conservation. with designations such as a Special Area of Conservation (SAC) that aims to protect freshwater, marine and estuary habitats and the species that use them. As the River Dee is tidal at Queensferry, works to the replacement bridge could influence habitats upstream and downstream, as well as mobile species such as otters, wildfowl and migratory fish.

The Scheme incorporates key mitigation measures in the construction methodology to reduce environmental impacts and includes standard pollution control methods and additional ecological measures. Before commencement of works, site walkovers, surveys, and Reasonable Avoidance Measures (RAMs) will be implemented, taking seasonal environmental constraints into account. As the Scheme progresses, further surveys would be conducted as

needed to validate baseline data and assess site areas before work begins. Mitigation has been integral to the design process, following a stepwise approach that emphasises avoiding, minimising, and mitigating impacts, particularly regarding marine ecological effects.

The replacement bridge would result in a permanent loss of some saltmarsh habitat along the narrow riverbank, but the removal of the existing bridge would alleviate its shading effects, eventually creating replacement habitat. To mitigate for the loss, an area of riverside at Greenfield would be managed by removing rock rubble from the foreshore. This would facilitate natural colonization by the surrounding saltmarsh.

There would be no significant adverse land use effects on the marine qualifying features of the SAC and other designations associated with the River Dee and its estuary. An adverse effect during construction of the new bridge piers on fish, overwintering birds and breeding birds would not be significant.



Figure 7: Lapwings and Little Egret flying over the River Dee
(Source: Richards, Moorehead & Laing)

Cumulative Effects and Interrelationships

A cumulative effect is the interaction or addition of effects generated by the Scheme in combination with other projects. An example is construction noise generated by the Scheme added to construction effects of other projects which could combine to produce a significant impact on a group of residents.

An interrelationship effect is the interaction between effects from the Scheme alone. An example is the loss of a small proportion of a habitat, coupled with increased noise disturbance in the remaining habitats.

Key environmental receptors of this Scheme include the local population and their health, and the sensitive marine environment of the River Dee and its estuary. There could be inter-relationship effects with other developments arising from construction noise and vibration and disturbance of river sediment, on species that use the river.

Other developments are sufficiently distant and represent a scale of change that would affect different receptors within the adjoining areas and so would not result in overlapping effects. Furthermore, the effects would not occur at the same time or would not represent a significant impact.

7. SUMMARY

The River Dee Replacement Scheme is a critical component of Welsh Government's Major Asset Renewal (MAR) programme, and the construction of a replacement bridge is the only feasible solution to maintaining the strategic road network in North Wales.

The Scheme proposals have been developed to avoid and minimise potential effects on the River Dee and wider environment. The EIA has determined that there may be some localised impacts caused by building the scheme during the construction period that could take 2-3 years. Mitigation measures have been identified in the design process and embedded into the Scheme proposals and proposed methods of construction to avoid and minimise potential adverse effects.

The Scheme incorporates appropriate measures to improve the existing environment by securing the long-term future of the bridge and strategic road network that cross the River Dee, connecting the active travel network and improving the local environment. Additional land would be secured through the implementation of the Scheme to increase opportunities for biodiversity.

The ES has found that with mitigation measures in place, there would be no adverse effects caused by the operation of the Scheme consistent with the existing A494 road corridor. It is anticipated that once completed, the Scheme would provide opportunities for enhancements to contribute net benefits to biodiversity by the provision of open watercourses, species rich grassland and hedgerows within the soft estate that could be maintained and managed in the long term.

The ES has considered the cumulative effects of the Scheme in combination with other proposed developments in Flintshire and has predicted that there would be no significant cumulative effects.

8. NEXT STEPS

Further Information

This Non-Technical Summary accompanies the draft Orders published for the Scheme, as listed above. They set out the land that would be required to build and maintain the Scheme and the environmental mitigation work that would be involved. The draft Orders include a draft Line Order to provide for the new section of trunk road and a draft Side Roads Order to deal with local highway matters (including roads, shared use paths, bridleways and byways) and private access matters, and a draft Compulsory Purchase Order, which provides for the acquisition of the land and rights required.

If you want to view any of the available documents and information, you will find them on the project website (<https://www.gov.wales/a494-river-dee-bridge>). Copies of the draft Statutory Orders, Environmental Statement and supporting information can also be inspected free of charge during normal working hours, or library opening hours, at the following deposit points:

- Welsh Government Offices, Sarn Mynach, Llandudno Junction, Conwy, LL31 9RZ.
- Deeside Library, Leisure Centre, Chester Road West, Queensferry, Deeside, CH5 1SA.

Paper copies of the Environmental Statement may be obtained from Welsh Government address given below at a cost of (plus postage and packaging):

- The Non-Technical Summary: £11.50
- Volume 1 (Technical Assessment Report): £150.00
- Volume 2 (Figures): £397.00
- Volume 3 (Appendices): £312.50

Orders Branch, Transport, Welsh Government Offices, Cathays Park, Cardiff, CF10 3NQ.

Your Views

Should you wish to support or object to the draft Orders, put forward an alternative proposal, or comment on the Environmental Statement, you should write to the Welsh Government by email to transportordersbranch@gov.wales or at the address below:

**Orders Branch, Transport, Department for Economy and Infrastructure,
Welsh Government, Cathays Park, Cardiff, CF10 3NQ.**

All such correspondence will be handled in accordance with the guidance on data protection and should be sent to arrive at the above address no later than the end of the objection and comment periods, as advised in the statutory public notices.

Depending on the nature and number of any objections and comments received to the published draft Orders, a Public Local Inquiry may be held before an independent Inspector.

If a Public Local Inquiry is to be held, all those who have responded would normally be notified within 4 weeks of the end of the objection period and the Inquiry held within 22 weeks of that notification. Full details of the Public Local Inquiry would be confirmed and notices would appear in the local press.

All correspondence would be copied to the Inspector and kept in the Inquiry Library which would be available to the public. Publicity would be given to any feasible alternative proposal received within a time limit to be specified within the Public Inquiry Notice.



