



Wirral Docks Bridges Major Scheme Business Case

Options Appraisal Report

November 2014

Wirral Council

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Executive Summary

Background and Introduction

In early 2014, the Liverpool City Region Local Transport Body (LCR LTB) completed a two stage prioritisation process for candidate major transport schemes across the City Region, in alignment with the indicative devolved funding allocation for the Single Local Growth Fund for the period 2015-2019. The Wirral Cross Docks Bridges scheme was ranked 8th out of a total of 13 prioritised schemes.

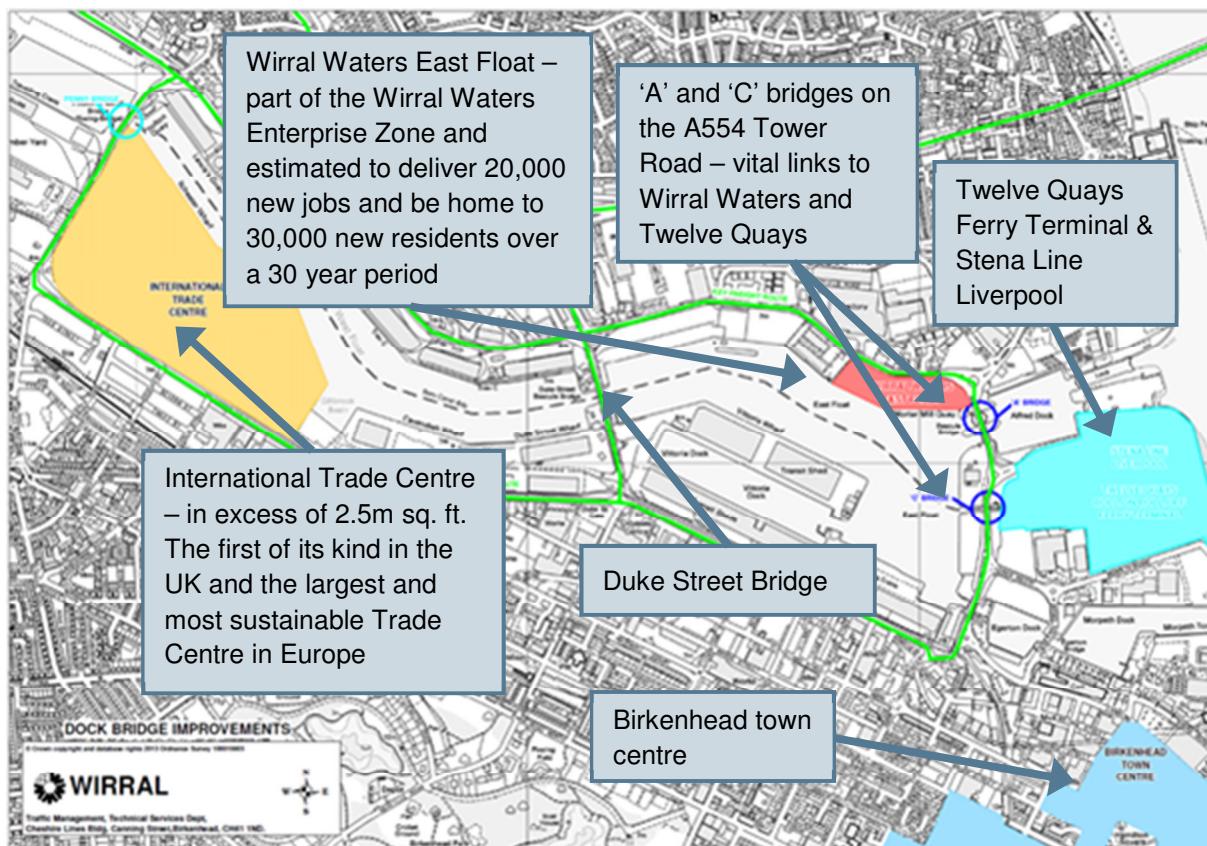
Each scheme promoter is now required to produce a robust, WebTAG compliant Major Scheme Business Case (MSBC). This document forms the Options Appraisal Report (OAR) for the Cross Docks Bridges scheme, which provides evidence of the need for intervention, documents the options development and assessment process and provides robust justification for the preferred option in line with scheme objectives. Further appraisal of the preferred option will be undertaken as part of the development of the Outline Business Case (OBC) and the full MSBC as part of a phased process.

Existing Situation

The Cross Docks Bridges form a vital link in the strategic road network in north Wirral, facilitating access to the Port of Liverpool (Birkenhead) and major regeneration sites. Bridges A and C, which form part of the A554 Tower Road, are of particular importance as they form part of the Merseyside Freight Network, providing a key link between the Twelve Quays roll on-roll off ferry terminal, the M53 and the Mersey Tunnels as shown in the strategic location plan provided overleaf.

A bridge is a lifting highway bridge owned and operated by Peel Ports, for which Wirral Council holds responsibility for maintenance as a highway structure. C bridge is a fixed highway bridge owned and operated by Wirral Council. Since 2009, Wirral Council has carried out a medium term (10-15 year) maintenance programme on the two bridges, with the expectation that they will remain serviceable until approximately 2018. These maintenance activities cause congestion and increased journey times due to road closures and traffic diversions, a situation that will worsen in the context of significant regeneration activity taking place in the local area. In addition several features of the bridges do not conform to current design standards, posing a safety risk.

Strategic Location Plan



Future Situation

Outline planning permission has been given for Wirral Waters, a £4.5bn development forecast to deliver 20,000 new jobs and accommodate 30,000 new residents over the next 30 years. Given the close proximity of the development site to A and C bridges and the fact that the A554 Tower Road will form one of its key access routes, there is a real need to ensure that the local highway network is sufficiently robust to accommodate this level of development.

At this stage, some highway improvements have been proposed by Peel Group to accommodate the ongoing development of Wirral Waters. These include modifications to the A5139 (Dock Road) connecting to the A554 (Tower Road), which in turn travels south connecting to A5030 (Cleveland Street), where further modifications are proposed, including proposals to dual the A5027 Duke Street. In addition, there is an aspiration to

develop a Light Rail Transport system. There are currently no proposals to increase the highway footprint across A and C bridges to accommodate increased demand as a result of local regeneration activity. However, there is scope to improve provision for pedestrians and cyclists across both bridges to increase the attractiveness of active modes for cross docks travel.

It is critical that local infrastructure can accommodate the forecast level of regeneration and development in the local area and also contributes to the future success of committed and proposed developments in the wider LCR.

The Need for Intervention

There is a clear need for intervention, both in terms of resolving existing and future transport issues and in terms of meeting local, LCR and national policy objectives:

- Existing bridge conditions - the assessed live loading capacity of both bridges is less than that required and the cantilever walkways on both bridges cannot currently sustain 5kN/m² footway loading. The bridges have limited headroom and there is evidence of bridge strikes as a result of this. The potential for an impact which could result in closure of the route is significant. In addition, there are several areas of section losses on both bridges that reduce structural capacity.
- Sub-standard features – there are several features that do not conform to current design standards which are considered to pose a threat to public safety, including the pedestrian parapets, open machinery and lead based paint.
- Risks to commercial port operations – a catastrophic bridge strike or machine failure with respect to A Bridge would halt local port operations, with significant commercial and economic impacts.
- Future maintenance requirements – the maintenance liability associated with the existing bridges is such that an extensive programme of road closures and traffic diversions is required over the medium to long term, with resultant negative impacts on congestion, journey times, journey time reliability and air quality.
- Weight restrictions and bridge closure – over time, without replacement or planned maintenance, weight restrictions will need to be applied to both bridges to keep them open to general traffic for as long as possible. This will limit local commercial port operations and compromise the ability of the A554 to continue to operate as a key part of the Strategic Freight Network. In this situation, both bridges would in future need to close, to the detriment of local business and non-business users.

Scheme Objectives

A two level hierarchy of objectives has been developed, which provide a framework for future appraisal and evaluation of the chosen scheme. The strategic objectives reflect wider policy ambitions such as economic development that transport contributes to either directly or indirectly. The operational objectives relate specifically to what the scheme will address with respect to the two bridges.

The strategic objectives are as follows:

- To support the regeneration and development activity taking place in the local area and wider City Region, through the provision of an efficient, well-functioning transport system that enables the effective, sustainable movement of people and goods.
- To support the implementation of Core Strategy Policies CS2, 4, 5, 12, 16 and 41.
- To contribute to each of the Priorities identified by the LEP (Low Carbon Economy, Knowledge Economy, Visitor Economy and SuperPort).
- To contribute to each of the six objectives set out in the LCR LTP3.

The operational objectives are as follows:

- To keep the A554 corridor open to traffic over the longer term, particularly for freight traffic given that the corridor is part of the Merseyside Freight Network.
- To reduce the level of lane/road closures and traffic diversions associated with the operation and maintenance of the two bridges, in order to improve journey time reliability and maintain continued access across the docks for vehicular traffic, pedestrians and cyclists.
- To improve provision for pedestrian and cyclists along the A554 corridor.
- To improve safety for vehicular traffic along the A554 corridor in terms of providing a route that complies with current design standards.

The anticipated outcomes are as follows:

- The efficient movement of people and goods;
- Vehicle journey time and journey time reliability improvements;
- Improved travel options for local people;
- Reduced severance and improved access to opportunity;
- Improvements to safety for cross-docks travel;
- Improved health and wellbeing for local residents;
- Air quality improvements as a result of reduced traffic diversions;

- Reductions in noise pollution as a result of less queuing and congestion associated with maintenance activities; and
- A new equitable Bridge Operating Agreement between Wirral Council and Peel Group.

Options Long List

Based on the identified need for intervention and the scheme objectives, a long list of nine potential scheme options was developed. High level assessment of these options was undertaken using the Early Assessment and Sifting Tool (EAST) in accordance with DfT requirements. An overview of the results is provided in the table below, with a full summary provided in Section 6 and the full results in Appendix A.

EAST Assessment Results – Scheme Long List

Scheme Option		Scheme Description	Assessment Outcome
1	Do Nothing	No planned maintenance on either bridge – statutory General and Principal inspections and emergency works only	Worse than the existing situation – with imminent bridge closure and significant commercial and transport impacts.
2	Do Minimum	Planned maintenance to enable safe provision for 40 tonne live load capacity and 45 Units HB capacity and 5kN/m ² pedestrian loading capacity.	Represents the existing situation – keeping the bridges open to general traffic and delaying the closure date for as long as possible.
3	Do Something 1	Replacement of A bridge with a new lifting bridge structure and replacement of C bridge with a new static bridge structure.	Construction is feasible, significantly reduces the existing maintenance liability and supports economic development and regeneration.
4	Do Something 2	Replacement of A bridge with a new lifting bridge structure and replacement of C bridge with a causeway.	Causeway is not feasible on construction grounds due to the need to modify the culvert used to drain the East Float.
5	Do Something 3	Replacement of A bridge with a new static bridge structure and replacement of C bridge with a causeway.	Causeway is not feasible on construction grounds due to the need to modify the culvert used to drain the East Float. The replacement of A bridge with a static bridge structure would effectively prevent vessels from accessing the docks to the west of the bridge, severely limiting commercial port operations and

Scheme Option		Scheme Description	Assessment Outcome
			placing limitations on economic growth and development.
6	Do Something 4	Planned maintenance of A bridge and replacement of C bridge with a causeway.	Causeway is not feasible on construction grounds due to the need to modify the culvert used to drain the East Float.
7	Do Something 5	Planned maintenance of A bridge and replacement of C bridge with a new static bridge structure.	Construction is feasible, partly reduces the existing maintenance liability, carries reduced capital cost compared to replacement of both bridges.
8	Do Something 6	Replacement of A bridge with a new lifting bridge structure and planned maintenance of C bridge.	Construction is feasible, partly reduces the existing maintenance liability, carries reduced capital cost compared to replacement of both bridges.
9	Do Something 7	Replacement of A bridge with a new static bridge structure and planned maintenance of C bridge.	The replacement of A bridge with a static bridge structure would effectively prevent vessels from accessing the docks to the west of the bridge, severely limiting commercial port operations and placing limitations on economic growth and development.

The Do Minimum, Do Something 1, Do Something 5 and Do Something 6 options were taken forward for further development and assessment.

Options Development and Assessment

Each of the four scheme options identified during the initial sifting process then underwent further assessment as follows:

- Transport economic assessment carried out using the TUBA (Transport Users Benefit Assessment) programme, drawing on modelling evidence and outputs from the East Wirral Traffic Model (EWTM); and
- Wider strategic, economic, financial, environmental and social assessment in line with DfT guidance.

The initial economic assessment as reported in the draft OAR issued to project partners on 24th September 2014 was carried out over 60 years, during which two different scenarios were considered:

- The existing bridges are maintained – first 40 years of assessment; and
- The existing bridges have come to the end of their design life and are no longer operational – the last 20 years of assessment.

The table below summarises the results of the initial options assessment. Evaluation of the BCR of each option in isolation cannot be used to identify the preferred option, as an option can be assessed as generating high or very high Value for Money but may not be deliverable or may carry unacceptable risks. Therefore wider assessment of each of the four options was carried out, with the results summarised using a simplified RAG assessment. Grey shading indicates a neutral impact.

Summary of Initial Options Assessment

Option	Strategic Fit	Wider Economic Impact	Environmental Impact	Social Impact	Deliverability	BCR
Do Minimum	Yellow	Yellow	Grey	Yellow	Green	N/A
Do Something 1	Green	Green	Yellow	Green	Green	10.5
Do Something 5	Yellow	Red	Yellow	Yellow	Yellow	2.95
Do Something 6	Yellow	Yellow	Yellow	Yellow	Yellow	4.93

Do Something 1 was identified as the preferred option, based on its BCR, which shows Very High Value for Money (VfM) based on DfT criteria and also wider assessment of its fit with scheme objectives, performance against economic, environmental and social criteria and in terms of its overall deliverability.

The draft OAR was discussed at a Project Board meeting held on 30th September 2014, at which Peel expressed concerns over the assumption that the bridges can only be maintained for a further 40 years, after which time they are closed to all traffic. It was agreed that refinements to the modelling approach would be made to reflect a 60 year maintenance period and additional information on costings was provided by AECOM to facilitate this.

The revised economic assessment considered the following options:

- Do Minimum - carry out the planned maintenance programme on both A and C Bridges as detailed in the Technical Feasibility Report for 60 years;
- Do Something 1 – replace both A and C Bridges;

- Do Something 5 – maintain A Bridge for a period of 60 years and replace C Bridge; and
- Do Something 6 – replace A Bridge and maintain C Bridge for a period of 60 years.

The table below summarises the performance of each option according to DfT criteria.

Summary of Revised Options Assessment

Option	Strategic Fit	Wider Economic Impact	Environmental Impact	Social Impact	Deliverability	BCR
Do Minimum						N/A
Do Something 1						5.91
Do Something 5						4.35
Do Something 6						7.78

The initial BCR calculated for each of the three Do Something options considered represents very high Value for Money according to DfT criteria. Do Something 1 was found to perform best against the wider assessment criteria in terms of strategic fit, deliverability and performance against economic, social and environmental considerations and in the context of the existing key issues identified for each bridge.

The assessment results are presented in more detail in Section 7 and the full Economic Assessment Report is provided in Appendix B.

Preferred Option

Based on the available evidence, Do Something 1 (the replacement of A bridge with a new lifting bridge structure and the replacement of C bridge with a static bridge structure) is identified as the preferred scheme option. The chosen scheme will be subject to further appraisal and refinement during the preparation of the OBC.

Project Delivery

A Project Board has been established that will provide the necessary ownership, governance and strategic direction to ensure that all project objectives, outputs and

outcomes are achieved within agreed budgets and timescales. The Project Board meets quarterly or more often if required.

The table below shows indicative capital costs and funding sources for the preferred option. This will be subject to refinement during the OBC preparation process.

Indicative Capital Scheme Costs (£m)

Funding Source	2016/17	2017/18	Total
LGF Contribution Sought	0.9	3.43	4.33
Local Contribution (Wirral Council)		0.67	0.67
Third Party Contribution (Peel Ports) – Sustainable Transport Contribution Tariff under the Wirral Waters East Float S106 Agreement		0.41	0.41
Third Party Contribution (Peel Ports) – under the existing Operating Agreement for A bridge held with Wirral Council		1.33	1.33
Total Capital Scheme Cost	0.9	5.8	6.74

The timescales for project delivery have been identified as follows:

- OBC submission: March 2015;
- MSBC submission: May 2015;
- Full funding approvals: 2015;
- Planning consents: 2015/2016;
- Stakeholder engagement and consultation: 2015-2018;
- Detailed design: 2016-2017; and
- Construction: 2017-2018.

1 Introduction

1.1 Liverpool City Region Major Transport Schemes Programme

In early 2014, the Liverpool City Region Local Transport Body (LCR LTB) completed a two stage prioritisation process for candidate major transport schemes across the City Region, in alignment with the indicative devolved funding allocation for the Single Local Growth Fund for the period 2015-2019. The Wirral Cross Docks Bridges scheme was ranked 8th out of a total of 13 prioritised schemes. The LCR LTB has requested that each scheme promoter produces a robust, WebTAG compliant Major Scheme Business Case (MSBC) for consideration by the LCR Combined Authority (LCRCA) and the Department for Transport (DfT).

1.2 Options Appraisal Report Development

This document forms the Options Appraisal Report (OAR) for the Wirral Cross Docks Bridges scheme, in relation to A and C bridges on Tower Road, Birkenhead. The OAR has been prepared in accordance with Transport Analysis Guidance published by the DfT in January 2014. It documents the options development and assessment process, provides evidence and justification for the need for intervention and demonstrates that the identified preferred option best meets the identified needs and opportunities and the overall scheme objectives and outcomes. The preferred option identified for each bridge will then be fully appraised during the later stages of Outline Business Case (OBC) and MSBC development as part of a phased process.

The OAR draws on information presented in a Technical Feasibility Report produced by AECOM (Rev A 03/11/2014), which is provided as a separate report. The main aim of the Technical Feasibility Report was to assess the current live loading capacity of A and C bridges and estimate their residual life span based on a deterioration prediction modelling exercise, assuming no further maintenance is carried out over the next 40 years. The Report also briefly examines potential bridge replacement options, including whole life costings, possible project risks and potential procurement strategies. The Report also gives consideration to the condition of Duke Street Bridge due to its role as the designated diversion route during future construction activity with respect to A and C bridges.

Following this introduction, the OAR is structured as follows:

- Section 2: Existing Situation – provides background information on A and C bridges, details their current ownership and condition and sets out the current opportunities and constraints.
- Section 3: Future Situation – details future land uses, policies and changes to the transport network in the context of changing travel demand in the local area that will be considered in scheme development.
- Section 4: The Need for Intervention – justifies the need for intervention, based on the existing condition of the bridges and future maintenance requirements and wider strategic objectives in relation to regeneration and development.
- Section 5: Scheme Objectives – sets out the objectives that the preferred option must meet.
- Section 6: Options Long List – details the initial long list of options considered and appraised using the DfT's Early Assessment and Sifting Tool (EAST) and presents the resulting short list of options for further assessment.

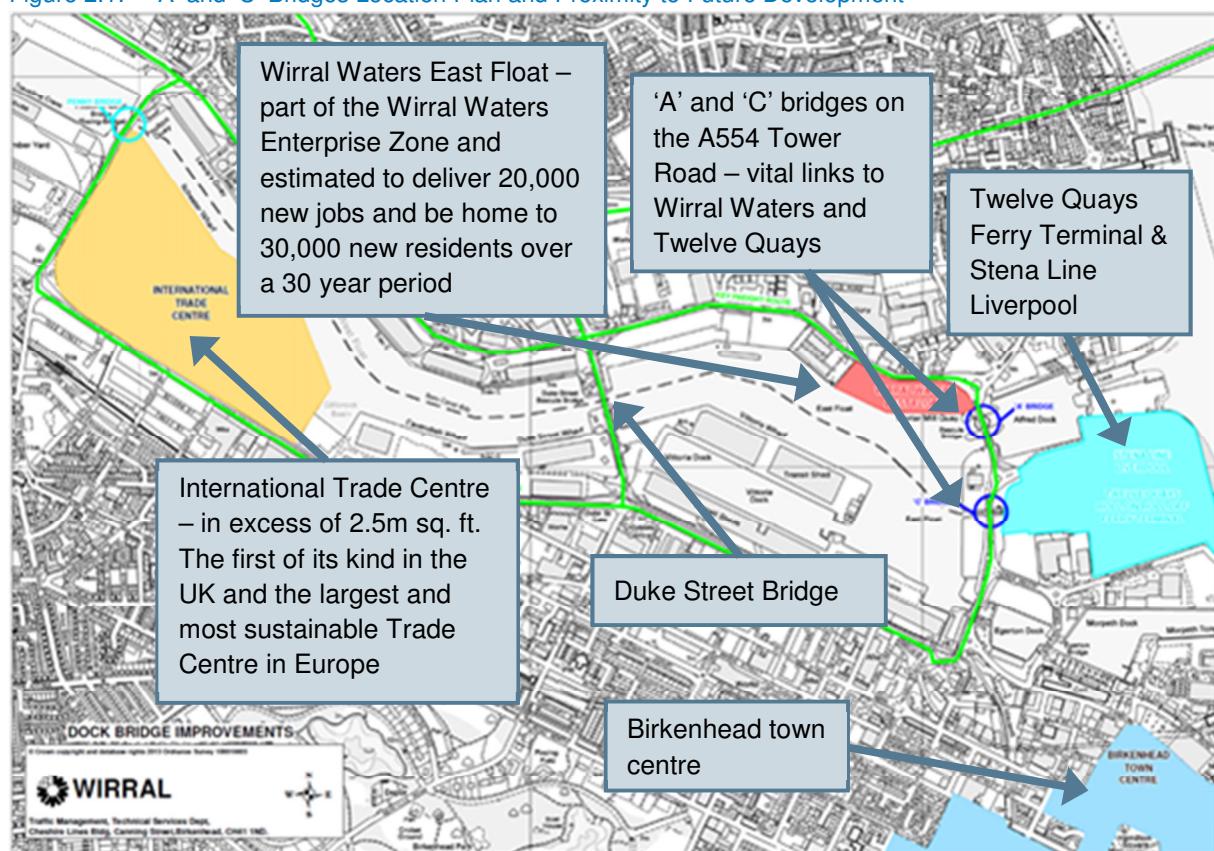
- Section 7: Options Development and Assessment – details the methodology used to appraise the options short list, presents the assessment results and identifies the preferred scheme option.
- Section 8: Project Delivery – provides outline information on project delivery, including governance, scheme costs, forward programme and risk.
- Appendix A: Full EAST Output – provides the full EAST output and documents the sifting process for the long list of potential scheme options.
- Appendix B: Economic Assessment Report – provides details of the transport economic assessment work undertaken to support identification of the preferred option.

2 Existing Situation

2.1 Background and Context

The Wirral Cross Docks Bridges form a vital link in the strategic road network in north Wirral, facilitating access to the Port of Liverpool (Birkenhead) and major regeneration sites as shown in Figure 2.1. Bridges A and C, which are situated on the A554 Tower Road in Birkenhead, are of particular importance as they form part of the Merseyside Freight Network, providing a key link between the Twelve Quays roll on-roll off ferry terminal, the M53 and the Mersey Tunnels. Bridge A is a lifting bascule steel through-truss highway bridge owned and operated by Peel Ports, for which Wirral Council holds responsibility for maintenance as a highway structure. Bridge C is a fixed steel through-truss highway bridge owned and operated by Wirral Council.

Figure 2.1: 'A' and 'C' Bridges Location Plan and Proximity to Future Development



Since 2009, Wirral Council has carried out a medium term (10-15 year) maintenance programme on the two bridges, with the expectation that they will remain serviceable until approximately 2018. This ongoing and costly maintenance, both planned and reactive, causes severe congestion due to road closures and diversion routes and associated increases in journey times. Without intervention, more frequent occurrences of full or partial closures will be required to carry out the necessary maintenance activities, worsening the associated impacts.

Significant regeneration activity is taking place in the local area, which is forecast to increase and intensify. Peel Group has been granted outline planning consent for the substantial regeneration and redevelopment proposals associated with the Wirral Waters scheme in the Wirral Docklands adjacent to A and C Bridges, which is estimated to deliver 20,000 new jobs and accommodate 30,000 new residents over the next 30 years. It is therefore critical that local infrastructure has the capacity and is of a sufficient standard to accommodate this level of development. Partial and/or permanent closures of the bridges would significantly compromise the ability of the local area to capitalise on regeneration opportunities such as Wirral Waters and SuperPort, which are critical future drivers of sustained economic growth in the LCR as identified in Merseyside Local Transport Plan 3 and the LCR Growth Plan. More detailed information on these and other relevant regeneration projects and proposals is provided in Sections 3 and 4.

2.2 A and C Bridges

Table 2.1 provides a summary of A and C bridges in terms of their structure, location, transport provision and ownership.

Table 2.1: Summary of A and C Bridges

Bridge	Location	Type	Ownership & Maintenance	Transport Provision
A	A554 Tower Road, connecting Seacombe and Woodside in Birkenhead	Rolling bascule bridge	Ownership and operation – Peel Ports Maintenance (excluding the operating mechanism) – Wirral Council	Carriageway – 7.15m, two way single lane Cantilever footpaths Headroom – 4.9m
C		Originally a rolling bascule bridge, converted in 1988/89 to a fixed truss bridge	Wirral Council	

The closure of A and C bridges for maintenance activities requires traffic to be diverted to the west via Duke Street bridge, part of the A5027 Upton Road between Seacombe and Woodside. Duke Street bridge provides for two way single lane traffic and carries cantilever footpaths. As with A bridge, the bridge is owned by Peel Ports and maintained (with the exception of the operating mechanism) by Wirral Council. Further information on the existing condition and maintenance requirements of A and C bridges is provided in Section 2.4.3, with detailed bridge inspection findings provided in the separate Technical Feasibility Report.

2.3 Policy Review and Strategic Fit

Wirral Council's vision is that "*Wirral will be a place where the vulnerable are safe and protected, where employers want to invest and local businesses thrive, and where good health and an excellent quality of life is within the reach of everyone who lives here.*" Improvement of the transport provision offered by A and C bridges supports this vision, through the contribution made to Wirral Waters and other regeneration

schemes and as a means by which local people can benefit from enhanced, sustainable access to opportunity.

2.3.1 Strategic Fit with Liverpool City Region Policy Objectives

Table 2.2 demonstrates how intervention meets Liverpool City Region policy objectives.

Table 2.2: Strategic Fit with Liverpool City Region Policy Objectives

Policy Objective	Scheme Strategic Fit
<i>Liverpool City Region Local Transport Plan Objectives</i>	
Help create the right conditions for sustainable economic growth by supporting the priorities of the Liverpool City Region, the Local Enterprise Partnership and the Local Strategic Partnerships	<ul style="list-style-type: none"> ▪ The highway network and strategic freight route must be fit for purpose and meet identified need in order to support sustainable economic growth within the dock estate and the Wirral Waters and SuperPort developments. In particular, improvements to journey time reliability and the transport 'offer' in terms of provision for sustainable modes are needed. ▪ The Wirral Waters development is a key City Region priority and is recognised as one of five major projects by the Local Enterprise Partnership. SuperPort is a key LEP priority.
Provide and promote a clean, low emission transport system which is resilient to changes to climate and oil availability	<ul style="list-style-type: none"> ▪ Intervention will help to ensure that the highway network and strategic freight route remain operational over the medium to long term. Even with regular maintenance, the bridges will in future need to close permanently, leading to route diversions, congestion and delays, with significant impacts on journey time reliability and consequential impacts on air quality. ▪ The implementation of alternative options for A and C bridges will enable improvements to be made to pedestrian and cyclist provision, which will increase the attractiveness of active, non-carbon emitting modes for cross docks travel.
Ensure the transport system promotes and enables improved health and wellbeing and road safety	<ul style="list-style-type: none"> ▪ Currently both A and C bridges have 7.3.m wide carriageways, constrained between large steel truss structures. This provides an intimidating and unsafe environment for cyclists and the riding surface is poor. The existing walkways are of sufficient width for pedestrians but are not an attractive walking route as the parapets have open rails which do not comply with current standards. ▪ Improved provision for pedestrians and cyclists will support an increase in active cross-dock travel and associated improvements in health and wellbeing and road safety.
Ensure equality of travel opportunity for all, through a transport system that allows people to connect easily with employment, education, healthcare, other essential services and leisure and recreational opportunities	<ul style="list-style-type: none"> ▪ The current bridges do not include segregated pedestrian and cyclist facilities and the standard of pedestrian provision is poor. The lack of adequate, safe facilities is a barrier for non-car owners in terms of accessing opportunities as the bridges provide connectivity to key employment areas and education facilities in Birkenhead and Wallasey and future opportunities at Wirral Waters and SuperPort. ▪ Improved provision for pedestrians and cyclists would support equality of travel opportunity for local residents.
Ensure the transport system supports the economic success of the city region through the efficient movement of people and goods	<ul style="list-style-type: none"> ▪ The regeneration of Birkenhead town centre and the Wirral Waters Enterprise zone relies heavily on an efficient transport network to support the movement of people and goods through the provision of journey time reliability. ▪ Intervention would support economic growth and development of the city region by ensuring reliable access to the Port of Liverpool Twelve Quays Ferry terminal, for people and freight movements, and Wirral Waters development area, including access to the proposed International Trade Centre. ▪ The implementation of alternative options would remove the need for temporary and/or permanent road closures, thus removing associated issues of congestion and delay.
Maintain our assets to a high standard	<ul style="list-style-type: none"> ▪ The Technical Feasibility Report undertaken by AECOM indicates that bridge replacement is the best value long-term solution. Currently, the bridges contain non-standard and potentially unsafe features as well as many elements that are a very high maintenance liability, which would contribute to significant whole-life costs if the bridges were retained past 2023. Without planned maintenance (including strengthening work to full capacity and maintenance of the capacity at that level) or replacement, weight restrictions will need to be imposed and the bridges will in future need to close permanently.
Enhancing cross Mersey linkages through the	<ul style="list-style-type: none"> ▪ Intervention that includes improved cycling and pedestrian facilities will contribute to improving overall accessibility across

Policy Objective	Scheme Strategic Fit
implementation of the Mersey Gateway project and the Mersey Gateway Sustainable Transport Strategy	<p>Wirral and Merseyside in order to provide enhanced and efficient access to public transport connections and interchange facilities.</p> <ul style="list-style-type: none"> ▪ The bridges offer a key link between the Wirral and the Mersey tunnels, which facilitate onward travel to the Mersey Gateway and wider regional road network.
<i>Liverpool City Region Local Enterprise Partnership Objectives</i>	
Knowledge economy	<ul style="list-style-type: none"> ▪ Improvements to the transport network will support links to areas that support advanced manufacturing, a key driver of the knowledge economy. A and C bridges are a critical element of the local highway network that directly serves the Wirral Waters Enterprise Zone (identified as a knowledge asset), which brings the benefit of Business Rates Relief and Enhanced Capital allowances. The bridges are also in close proximity to the International Trade Centre and proposals for an Advanced Manufacturing Supplier Park.
Visitor economy	<ul style="list-style-type: none"> ▪ The bridges directly support access to the Port of Liverpool Twelve Quays ferry terminal for visitors and onward access to local attractions on the Wirral and the wider Region. It is therefore crucial that they can continue to operate as part of a high quality, reliable transport network, to facilitate access to attractions and visitor amenities.
Low carbon economy	<ul style="list-style-type: none"> ▪ The bridges play a vital role in servicing the developing Cammell Laird and Alfred Dock sites in terms of road cargo with access from the motorway network, providing connectivity to the wider UK offshore facilities. Improvements in journey time reliability will therefore help to support the future growth of these sites, which have been identified within the LCR low carbon economy offshore wind hub as operational maintenance facilities.
SuperPort	<ul style="list-style-type: none"> ▪ Reliable, effective functioning of the bridges is essential to the operational effectiveness of SuperPort. A Bridge carries the Merseyside Freight Route Network across the dock passage between Alfred Dock and the East Float in Birkenhead docks. C Bridge spans the dock passage adjacent to the 12 Quays container park, which provides a balancing culvert for the dock system. The Port of Liverpool Twelve Quays RoRo terminal is used for passengers and freight between the city region and Belfast.
Major projects	<ul style="list-style-type: none"> ▪ Wirral Waters and SuperPort are both identified by the LEP as major projects. The bridges enable cross-dock access from Birkenhead and Wallasey, as well as access to the RoRo terminal; therefore they directly support these and other major projects such as the Seaforth in-river terminal.

2.3.2 Strategic Fit with Local Policy Objectives

It is also important to consider the local policy context in terms of planned development and regeneration proposals, to assess the potential impact that intervention could have (or alternatively the impact of not intervening) on the local area over the longer term.

The Third Local Transport Plan for Merseyside, which became active in 2011, identifies Wirral Waters as a City Region priority that will bring forward significant new housing and employment development over the longer term. The delivery strategy for LTP3 incorporates a degree of flexibility to ensure that appropriate transport measures can be put in place to support this and other developments at the right time. Transport measures should support the delivery of a new 'Mobility Culture' that integrates transport with wider policies that relate to health and wellbeing, the environment, education, housing and planning. In addition the transport system must support greater equality, where people benefit from more equal access to employment, education and training opportunities, health facilities and leisure, cultural and sporting resources.

Wirral Council's Core Strategy Submission Draft sets the overall framework for future land use planning decisions over the next 10 to 15 years and details the Council's view of what will be a sustainable pattern of development for Wirral. One of the strategic objectives set out in the strategy is economic revitalisation; specifically to support economic growth and a higher density of jobs and businesses within existing employment areas in east and central Wirral (including Birkenhead; the docks and industrial hinterlands; Mersey Waters Enterprise Zone; Twelve Quays Ferry Terminal; and the strategic port and marine engineering facilities at Cammell Laird) and in the borough's town, district and local centres. The primary focus for new jobs to support the economic revitalisation of the borough will be the Mersey Waters Enterprise Zone, its surrounding industrial and commercial hinterland and Birkenhead town centre.

Parts of East Wirral are already being developed and regenerated in response to this strategic objective, including the aforementioned Mersey Waters Enterprise Zone, which includes the area between Tower Road where A and C bridges are located and Wallasey Bridge Road. The Enterprise Zone includes Liverpool Waters, Wirral Waters and the Peel International Trade Centre and the economic revitalisation of the area is a strategic priority for Wirral and the wider Liverpool City Region.

The wider Commercial Core as identified in the Strategy, which includes the Dock Estate and Birkenhead town centre, provides just under 20% of the borough's jobs and is the largest contributor to its economic output; handling over 14 million tonnes of port cargo each year. The Council's vision and priorities for the area include the following:

- A mixed-use waterside neighbourhood at East Float;
- A thriving maritime, renewable energy and engineering sector centred on Cammell Laird; and
- Ongoing investment in a sustainable port economy at Twelve Quays, West Float and the International Trade Centre.

The transport priorities set out by the Council to support the delivery of these priorities include maintaining strong transport links and freight connections from the industrial areas and docklands to the M53

motorway, providing safe cycle access across the docks and improving overall cycling provision in Birkenhead.

Wirral Waters is the most significant regeneration and development proposal in the local area and wider City Region. A summary of schemes for which outline planning approval has been granted is provided below.

Wirral Waters

Wirral Waters is one of the most significant regeneration projects in the country that could lead to the delivery of up to £4.5bn private sector investment over the next 30-40 years. It is a major private sector led investment initiative being brought forward by Peel Group and its partners through a Strategic Regeneration Framework approach.

The development area is situated within a priority area for housing and economic development, both in the local and wider city-region context. Located within the Mersey Waters Enterprise Zone (which includes Liverpool Waters on the opposite side of the water), Wirral Waters is identified as a Major Project by the LEP and is supported in the Merseyside Local Transport Plan 3.

50 hectares of derelict and vacant dockland at East Float, West Float and Bidston Dock will be transformed to create more than 20,000 permanent new jobs in Wirral over the next 30 years, significantly increasing the local population. 70% of this population increase is expected to be made up of new migrants to the City Region.

Planning approvals to date include:

- Hydraulic Tower – 91 bed hotel and restaurant;
- North Bank East – mixed use development comprising up to 1,672 residential units plus offices, leisure, retail, bars and restaurants;
- East Float – mixed use development comprising up to 13,521 dwellings, plus over 620,000 square metres of commercial, tourism, educational and cultural activities; and
- International Trade Centre – more than 228,000 square metres of showroom, assembly, manufacturing and exhibition space for overseas companies to market goods to the UK and Europe.

Wirral Council is supportive of the delivery of 'large-scale, high-density, mixed-use, commercial led development' within the Birkenhead Dock Estate to support the economic growth and regeneration of the wider sub-region, as set out in Policy CS12 of its Draft Core Strategy submission document. In terms of transport schemes and improvements to support the development of the area, policy CS41 states that measures to improve traffic management and highway safety, including minor highway improvements and enhanced provision for public transport, walking and cycling will normally be permitted. In addition, land should be safeguarded to facilitate the delivery of a number of transport schemes, including 'schemes to support the delivery and integration of Wirral Waters and the Mersey Waters Enterprise Zone with the surrounding areas'.

The following sections provide information on the levels of service and capacity offered by the current and future transport networks and the current and future demands for travel by those living in Birkenhead and wider East Wirral.

2.4 Existing Transport Situation

2.4.1 The Local Transport Network

A and C bridges are located on the A554 Tower Road, a two way predominantly single lane carriageway that is subject to a 30mph speed limit. North of A and C bridges, the A554 Tower Road connects to the A5139 Dock Road at a roundabout junction for onward access to the M53. The southern end of the A554 Tower Road provides access to the A5029 Rendel Street and the A554 Canning Street at a roundabout junction for onward access to Birkenhead and other parts of east Wirral. Between A and C bridges, a roundabout junction connects the A554 Tower Road to the Stena Line Ferry Terminal.

Two bus stops situated to the south of C bridge on the A554 provide connections to destinations across the local Wirral area, including Arrowe Park Hospital, Birkenhead, Broughton, Queensferry and Upton via services 807, 817 and 874. However, there are a limited number of services per day and only the 817 (Arrowe Park Hospital – Broughton) provides a regular service (one service every two hours Monday to Friday).

The closest rail station to A and C bridges is Conway Park, which is situated just under a mile away. From here, Merseyrail operates services on the Wirral Line to New Brighton and West Kirby at a peak weekday frequency of every 15 minutes and services to Hamilton Square and onwards to Liverpool at a peak weekday frequency of every 5-10 minutes.

Both A and C bridges have cantilever footpaths for pedestrian movements; however neither provide segregated cycling facilities.

2.4.2 Levels of Service and Capacity

Figure 2.2 presents the current (2012) level of service and capacity in the vicinity of the scheme. The level of service and capacity is represented by the Volume/Capacity from assignment of the East Wirral Transport Model (EWTM) in the AM peak hour (08.00-09.00). A Volume/Capacity of greater than 85% is deemed to indicate congestion. The plot indicates that in the current year there is a good level of service and capacity on the transport network.

Figure 2.2: 2012 Level of Service and Capacity (V/C)



2.4.3 Existing Travel Demand

Table 2.3 below presents the demand to the area in the vicinity of the Wirral Docks Bridges. To provide a frame of reference, the equivalent figures for Wirral district are also presented. This information has been extracted from the EWTM for the model hours of AM Peak (08.00-09.00), IP (average hour 10.00-16.00), and PM Peak (17.00-18.00). It can be seen that there is relatively small demand to this area in 2012. Comparison with the future year demand (2030) is provided in Section 3.2.

Figure 2.3: Wirral Bridges Area

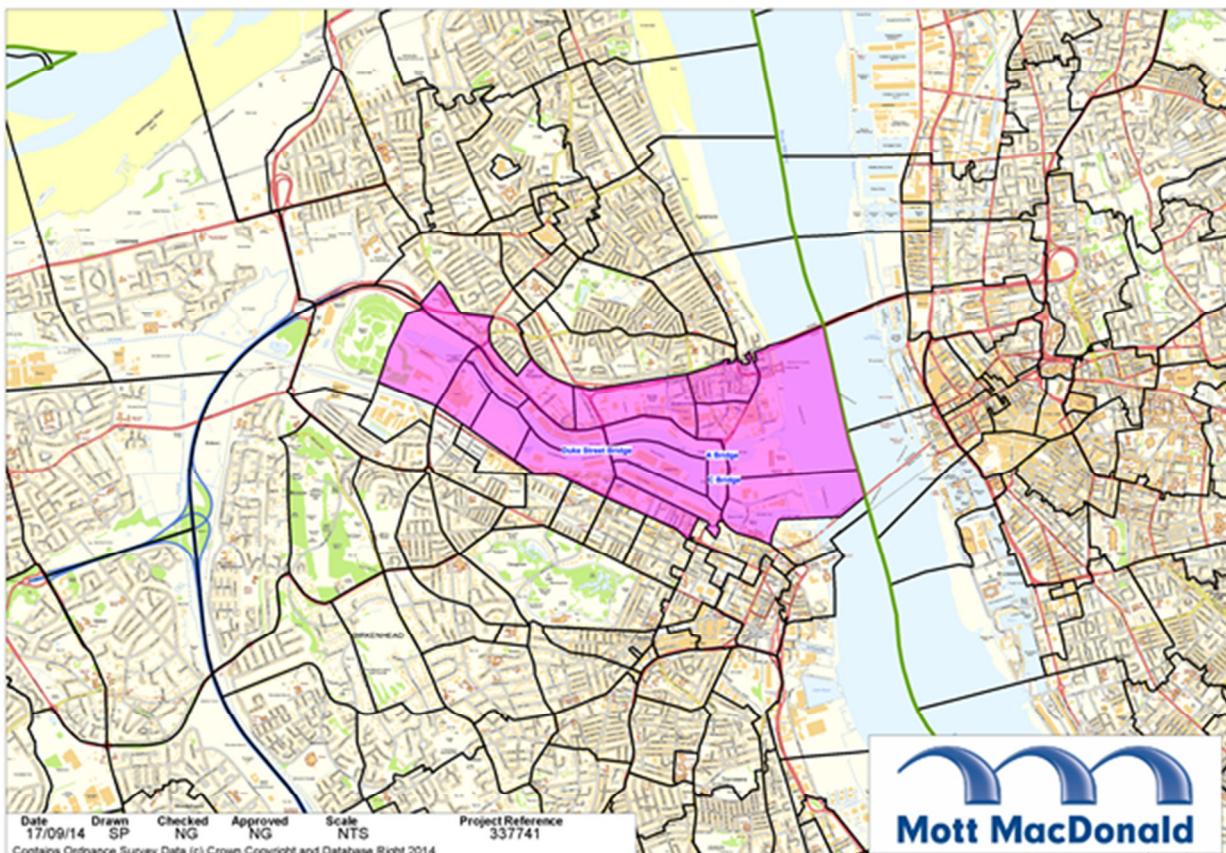


Table 2.3: Car Travel Demand (2012)

	2012		
	AM	IP	PM
Trips From Area	576	758	1,529
Trips To Area	1,606	699	598
Trips From Wirral	44,194	30,033	40,036
Trips to Wirral	41,576	30,013	42,722

2.5 Existing Constraints

As part of the Technical Feasibility Report, a desktop study was undertaken to identify possible site constraints that limit the potential options available with respect to A and C bridges. These are summarised in Table 2.4 below, with further detail provided in Section 5 of the separate Technical Feasibility Report produced by AECOM.

The most significant constraints to development are twofold:

- A and C bridges provide access to a commercial port that needs to remain open during any construction works; and
- Culverts exist in the vicinity of the existing bridge structures.

It is important these and the constraints do not limit the option generation process unnecessarily; therefore consideration has been given to the extent to which each of these constraints could potentially be overcome, as detailed in Table 2.4.

Table 2.4: Existing Constraints and Potential Mitigation Measures

Constraint	Potential Impact(s)	Potential Mitigation
Development & Construction Constraints		
There are a number of existing buildings in the vicinity of A bridge that may pose a constraint to development.	Delays to construction. Increased costs due to unexpected diversions required / poor ground conditions.	Establish the true nature of these structures, the local ground conditions and any utility services present prior to construction.
There is a listed building to the north-west of C bridge.	Unlikely to be impacted by the construction of a replacement structure.	Care is required when undertaking any bridge replacement works.
Archival information indicates that services culverts are present in the immediate vicinity of both A and C bridges, crossing underneath the channel, pier and dock walls.	Impacts on the maximum construction loads that can be supported in the area. Potential significant impact on the type of scheme chosen to replace the current structure. Cost implications associated with required service diversions – estimated at £350,000 for A bridge and £228,000 for C bridge.	Identification of the location and condition of these services at an early stage in any bridge replacement programme.
The location of C bridge is in close proximity to the culverts used to maintain the water level of East Float and also to drain it.	The replacement of C bridge with a structure other than a direct replacement bridge e.g. a causeway would require significant modification to the culvert system, causing an increase in scheme costs and potential delays in the construction programme.	Any modification to the channel would need to be co-ordinated and agreed with Peel Ports, with careful consideration of the benefits of replacing C bridge with a structure other than a direct replacement bridge versus the costs and level of risk. Any scheme should take into consideration the proposed Wirral Waters development in order to mitigate any adverse impacts on the area from multiple road closures due to construction.
Preliminary site investigations indicate that Water Mains diversion may be required for the replacement of A bridge and both Water Mains and Telecoms diversions may be required for the replacement of C bridge.	Estimated costs of services diversions are calculated to be £350,000 and £228,000 for A and C bridges respectively. The two bridges are located in an Enterprise Zone where super-fast broadband is being rolled out; therefore it is essential that any works related to the bridges do not have a negative impact on these works.	Early identification of the exact nature of services to be diverted and how diversion will take place. Inclusion of these elements in the costings for potential scheme options.
There is an indication that the ground may be unsafe on the northern bank adjacent to A bridge.	The ground could prove unable to accommodate large loading forces generated in decommissioning of the bridge as part of a bridge replacement project.	Undertake robust ground investigation prior to design and construction and carry out any necessary stabilisation works.
The pier where A bridge is located is the primary access for East Float, a commercial port that would need to remain in operation whilst a replacement bridge is constructed.	Negative impacts on local commercial operations, leading to loss of revenue.	Plan construction works to mitigate any potential negative impacts on commercial operations via planned limited closure of the access way.
C bridge provides essential access to an operational Stena Line commercial port.	Negative impacts on local commercial operations, leading to loss of revenue.	Plan construction activities to mitigate any possible negative effects on commercial operations, via specific

Constraint	Potential Impact(s)	Potential Mitigation
The initial Environmental Feasibility Study indicates that protected and UK BAP (UK Biodiversity Action Plan) species may be present in the vicinity of A and C bridges.	The presence of such species could cause delays to any construction programme, limit the options available and/or prevent construction from taking place if appropriate mitigation measures cannot be identified.	planned limited closure of the access way. Conduct an extended Phase 1 Habitat Survey as part of the Environmental Impact Assessment undertaken for any bridge replacement scheme. Liaise with Wirral Council's Planning Department to determine the potential applicability of Permitted Development Rights.
The A and C bridges are located in an area of industrial heritage; therefore the ground may be contaminated.	Delays in construction, increases in cost to accommodate decontamination costs.	Any excavations or works must take the possibility of contaminated land into account. On-site surveys and ground investigations to be carried out prior to the commencement of any works.
Structural & Mechanical Constraints		
Both A and C bridges have limited headroom. Transverse members have undergone significant vehicular impact in the past and the potential for an impact that could result in a catastrophic failure and thus closure of the route to traffic is significant.	A bridge is an opening structure for a busy commercial port; therefore there could be significant commercial and financial impacts if the structure was rendered inoperable. Bridge failure could trap maritime vessels within the dock, preventing them from departing until emergency repairs can be completed. Local traffic conditions would also worsen as a result of reduced connectivity due to the need to follow diversion routes as an alternative to Tower Road. In the worst case scenario the bridge could collapse into the dock as a result of a catastrophic strike.	A manual method of raising and lowering the structure is possible but only suitable as a very short term measure. Bridge replacement would provide an opportunity to provide the necessary height clearance in accordance with the required standards, thus reducing the risk of future catastrophic failure and potential closure of the route to traffic.
The mechanical aspects of A bridge could fail, rendering it inoperable.	Significant commercial and economic impacts as stated above. Bridge failure could trap maritime vessels within the dock, preventing them from departing until emergency repairs can be completed.	A manual method of raising and lowering the structure is possible but only suitable as a very short term measure. Bridge replacement would provide an opportunity to renew the mechanical aspects of A bridge, with reduced future risk of failure / non-operation.
Institutional & Legal Constraints		
Peel Group owns and operates the East Float and Alfred dock; therefore any modifications to the dock required as a result of works undertaken on A and C bridges will require co-ordination between Peel Group and Wirral Council.	Peel Group does not agree to proposed modifications, delaying or threatening the viability of the proposed scheme.	Peel Group is a key member of the Project Board and attends Project Board meetings on a regular basis. Early agreement from Peel to be sought for any proposed modifications that could impact on local port activities, either during construction or operation.
Peel Group owns and operates A bridge; however an Operating Agreement means that Wirral Council is responsible for the structural maintenance of the bridge.	Peel Group does not agree to proposed modifications or does not agree to make the required financial contribution, delaying or threatening the viability of the proposed scheme.	Peel Group is a key member of the Project Board and attends Project Board meetings on a regular basis. Early agreement from Peel to be sought in terms of any funding contributions required for A bridge.

Constraint	Potential Impact(s)	Potential Mitigation
Current uncertainty over whether bridge replacement falls under Permitted Development Rights or whether planning approvals would be needed.	Insufficient time/budget allocated to gain the necessary approvals for proposed modifications.	Early discussion and confirmation with Wirral Council Officers as to whether planning approvals are required.

2.6 Existing Opportunities

There are a number of opportunities to improve the local transport system with respect to A and C bridges and also to positively impact on issues of wider concern, in particular the significant regeneration activities taking place in the local area. The key opportunities are set out in Table 2.5 below.

Table 2.5: Key Opportunities

Opportunity	Commentary
Help secure the expeditious movement of traffic on the local road network as part of the Council's obligations under the Traffic Management Act 2004.	The maintenance requirements associated with A and C bridges mean that frequent road closures and traffic diversions are required. The frequency of these closures will increase as the bridges approach life expiry, thus limiting the expeditious movement of traffic, with potential knock-on impacts on access to local regeneration and development areas.
Support the significant level of regeneration activity taking place in the vicinity of A and C bridges and in the wider Liverpool City Region.	Wirral Waters is a significant, long-term regeneration project in the immediate vicinity of the two bridges. The efficient functioning of the local transport network including A and C bridges is critical to supporting access to the developments taken forward as part of Wirral Waters. The future success of other developments, including Liverpool Waters and SuperPort is inextricably linked to the successful development of Wirral Waters.
Reduce the number of bridge strikes that occur on the existing bridges, thus reducing the potential for personal injuries and the number of emergency closures and traffic diversions required.	The bridges have limited headroom and there is evidence of past vehicular strikes. Future bridge strikes could cause catastrophic failure that means that the route must be closed to all traffic. There is therefore an opportunity to improve provision for larger vehicles, in particular port traffic, to support commercial operations and reduce the need for traffic diversions.
Improve pedestrian and cycle access along the A554 Tower Road.	The pedestrian footways on C bridge are currently in a poor state and are considered to pose a risk to public safety. The pedestrian parapets on both A and C bridges do not conform to current standards and neither footpath can sustain 5kN/m ² footway loading. There is a significant opportunity to improve provision for pedestrians and cyclists to improve accessibility in the local area, support wider regeneration and reduce the risk of personal injury accidents. The Section 106 Agreement for Wirral Waters requires Peel Group to provide enhanced cycle and pedestrian facilities on the route funded from the Sustainable Transport tariff.
Improve the contribution made to all LCR LTP objectives and LEP Priority Areas and support the implementation of Core Strategy Policies CS2, 4, 5, 12, 16 and 41.	There is an opportunity to make a more significant contribution to achieving local and City Region objectives in terms of regeneration and development, local priority projects and sustainable transport, by improving transport provision in the local area.

3 Future Situation

3.1 Future Land Uses and Policies

The Wirral Waters development will have a significant impact on land use in the area surrounding A and C bridges. As described in Section 2.3, outline planning permission has been obtained for proposals comprising a £4.5bn development that will provide 465,000m² of office space and in the region of 15,000 residential units. The detailed nature of individual developments within the wider scheme will only be confirmed at full planning application; however the scheme proposals relating to A and C bridges must take account of the significant level of planned commercial and residential development proposed.

One of the priorities set out in Wirral Council's Core Strategy Proposed Submission Document is to establish a series of new city neighbourhoods both at Wirral Waters and around Birkenhead Town Centre, including significant housing development and the provision of supporting leisure, retail, community, health and community uses. The Core Strategy states that a minimum of at least 12,500 net additional dwellings will be provided for between 2003 and 2028, equivalent to an annual average requirement of 500 net new dwellings over the same period. It is therefore likely that changes will need to be made to the transport system to provide the level of capacity required to support this and other future development.

3.2 Future Levels of Service and Travel Demand

Figure 3.1 presents the future (2030) level of service and capacity, represented by the Volume/Capacity from assignment of the EWTM in the AM peak hour (08.00-09.00). A Volume/Capacity of greater than 85% is deemed to indicate congestion. The plot indicates that in the future year there is a good level of service and capacity on the transport network.

Figure 3.1: 2030 Level of Service and Capacity (V/C)



Table 3.1 presents the future year (2030) demand to the area in the vicinity of the Wirral Docks Bridges for the AM, IP and PM peak periods. The 2012 data is provided for reference. The EWTM 2030 demand was produced based on applying trip end growth predicted by the DfT's TEMPRO software to the EWTM 2012 base year demand. Based on the TEMPRO data, it can be seen that there is relatively small demand to this area in both 2012 and 2030. However, it should be noted that TEMPRO forecasts indicate a 5% decrease in employment growth over the period 2012-2030, whereas LCR LEP forecasts indicate a 9% increase in employment growth over the same period. This may be because the employment growth associated with Wirral Waters has not been factored into the TEMPRO forecasts. This is something that will be analysed in more detail during the preparation of the OBC to ensure that the growth forecasts used are those which most accurately reflect the anticipated future situation.

Table 3.1: Car Travel Demand

	2012			2030		
	AM	IP	PM	AM	IP	PM
Trips From Area	576	758	1,529	586	782	1,530
Trips To Area	1,606	699	598	1,608	722	611
Trips From Wirral	44,194	30,033	40,036	44,812	31,144	40,463
Trips to Wirral	41,576	30,013	42,722	41,867	31,195	43,432

3.3 Future Changes to the Transport System

Future changes to the transport system and the demand for transport will predominantly occur as a result of Wirral Waters being taken forward over the medium to long term. At present, outline planning permission has been granted and full planning permission will be sought prior to each individual development being taken forward as part of the wider scheme.

At this stage, some highway improvements have been proposed by Peel Group to accommodate the ongoing development of Wirral Waters. These include modifications to the A5139 (Dock Road) connecting to the A554 (Tower Road), which in turn travels south connecting to A5030 (Cleveland Street), where further modifications are proposed, including proposals to dual the A5027 Duke Street, which would require Peel Group to replace the bridge. In addition, there are potential plans to develop a Light Rail Transport system.

Drawings prepared by SBA on behalf of Peel for the outline planning application for Wirral Waters show that the highway footprint across both bridges does not need to be increased to accommodate the anticipated increased traffic flows along the A554 Tower Road. Therefore for the purposes of the Major Scheme Business Case, the existing highway layout is considered to be sufficient to meet the anticipated future demand on the local highway network.

There is scope to improve provision for pedestrians and cyclists across both A and C bridges. The Section 106 Agreement for Wirral Waters requires Peel Group to provide combined pedestrian and cycle facilities on A and C bridges funded by the Sustainable Transport tariff. Proposed improvements in provision should align with any wider proposals that exist for active travel along the A554 Tower Road.

4 The Need for Intervention

4.1 Current Transport Related Problems

This section sets out the current transport related problems that demonstrate the need for intervention, both in the context of relevant local, City Region and national policies and in relation to specific local issues.

4.1.1 Existing Bridge Conditions – Key Issues

This section provides a summary of the existing condition of both A and C bridges based on the findings of comprehensive bridge inspections and highlights key issues that impact on traffic, pedestrian and cyclist movements in the local area. Further detail is provided in the separate Technical Feasibility Report.

A and C bridges have an assessed current live loading capacity of 40T + 34Units HB and 40T + 40Units HB respectively; therefore both are less than the required live loading capacity of 40T + 45Units of HB loading. In addition, the cantilever walkways on both bridges cannot currently sustain 5kN/m² footway loading and current capacity on each structure is just less than 2.5kN/m².

Overall, A bridge is considered to be in fair to poor condition, with several localised areas of section losses that reduce structural capacity, particularly below the deck level. Furthermore, there is evidence of bridge strikes affecting the top plan bracing. C bridge has been assessed as being in similar condition, with evidence of longstanding section loss to the members.

Table 4.1 overleaf highlights the key issues associated with the existing conditions of each bridge that impact on transport movements and contribute to transport related problems in the local area.

It should be noted that, although Duke Street Bridge is identified as the main alternative traffic route when A and/or C bridge is closed, the scheme put forward in the Major Scheme Business Case will not consider Duke Street Bridge as the structural elements of the bridge required for highway provision are in better condition. Duke Street Bridge was completely replaced (with the exception of the main trusses and machine house structure) in 1993 and designed to current highway loading; therefore it is not a priority for intervention due to increased design life and better structural condition.

Table 4.1: Existing Bridge Conditions - Key Issues

Key Issue	Contribution to Transport Related Problems
A Bridge	
<p>Several defects are causing a loss of load bearing capacity, particularly below deck and also the beam flanges, which have been subject to impact damage. Currently, the bridge has sufficient capacity to support 40 tonnes HA loading and up to 34 units of HB loading, which suggests that immediate works are required to provide for abnormal loads.</p>	<p>Without immediate works, weight restrictions for Abnormal Indivisible Loads (AILs) will need to be implemented. This would have an impact on local commercial operations, in particular access to East Float and the Stena Line Ferry Terminal. AILs will likely be diverted via Duke Street Bridge, lengthening journey times, increasing the likelihood of congestion and increasing associated impacts such as noise and emissions.</p>
<p>The existing cantilever footway fails in 2014 for the normal highway design loading for footways on bridges. In addition, the west deck edge beam has suffered full section loss at localised locations to the top flange and to the web. Moreover, one of the elements of the diagonal bracing has also suffered severe section loss.</p>	<p>Currently, the bridge does not offer a safe, reliable route for pedestrians and cyclists, contributing to severance issues between Birkenhead, the Docks and onwards through Seacombe and North Wirral.</p> <p>Immediate works are required to strengthen and improve the footway, in order to reduce severance and improve pedestrian accessibility between Birkenhead and the Docks and also to developments at Wirral Waters.</p> <p>Future events at the docks where a high number of spectators are expected would require the footpaths to be closed or strengthened to accommodate this loading.</p>
<p>The mechanical aspects of A bridge may fail, which would render the bridge inoperable. A manual method of raising and lowering the structure is available; however it is time consuming and only acceptable as a very short term solution.</p>	<p>Any such failure of A bridge could trap maritime vessels in the dock, preventing them from departing until emergency repairs are completed. This situation would also hinder the commercial activities associated with the port and impact on local traffic conditions by reducing connectivity across the dock.</p>
C Bridge	
<p>Several defects are causing a loss of load bearing capacity. Currently, the bridge has sufficient capacity to support 40 tonnes HA loading and up to 34 units of HB loading, which suggests that immediate works are required to provide for abnormal loads.</p>	<p>As for A bridge.</p>
<p>The pedestrian footways are in poor condition, with severe degradation of the wearing course exposing timber deck members and failure of support along the external edges, thus leading to concern over public safety. In addition, the existing footway fails in 2014 for the normal highway design loading for footways on bridges.</p>	<p>As for A bridge.</p>
Both Bridges	
<p>There are several features of both bridges that do not conform to current design standards and/or are considered to be unsafe, including:</p> <ul style="list-style-type: none"> ■ Pedestrian parapets; ■ The paint system (which is lead based) requires replacement in the short to medium term to help prevent progressive deterioration of structural members and connections; ■ The detailing of the structures is not compliant with modern methods for preventing the collection of debris, which contributes to the initiation of corrosion; ■ The properties of the steel used are unlikely to meet the requirements of modern standards; ■ Impact protection (either from road vehicles or shipping) is not to current standards; 	<p>These features not only pose risks to public safety, they also increase the risk of potentially catastrophic failure of the bridges that could mean that the route is closed to traffic. This would place additional demand on alternative routes such as Duke Street, which may worsen over time in the context of significant regeneration activity taking place in the local area.</p> <p>Any catastrophic failure of A bridge will also prevent vessels from entering the dock, severely limiting commercial port operations and hindering economic growth.</p>

Key Issue	Contribution to Transport Related Problems
<ul style="list-style-type: none"> ■ The structures are statically determinate; therefore if a member was taken out by impact or deterioration, the structure could undergo a global collapse; and ■ There is open machinery present on A bridge and the moving structures do not meet current requirements in terms of health and safety legislation. <p>The current headroom clearance does not conform to the required standards; the headroom height is 4.9m whereas standards require the headroom clearance to be 5.7m. There is evidence that transverse members have undergone significant vehicular impact in the past.</p>	<p>Bridge strikes mean that unplanned closures and traffic diversions are required, adding traffic to other parts of the network and increasing the possibility of congestion. Larger HGVs must re-route via longer routes, with impacts on commercial operations.</p> <p>A bridge is an opening structure for a busy commercial port, where the ingress and egress of maritime vessels is critical. A vehicle or maritime bridge strike that rendered the bridge inoperable would have significant commercial and financial consequences: in the best case scenario, emergency repairs would be required to regain functionality; in the worst case scenario the structure could collapse into the dock and close the bridge to all traffic.</p> <p>A maritime vessel strike on C Bridge is less likely as the structure is now a static bridge. However, there is still a risk of vehicle strikes that could cause the bridge to fail. This would hinder access to the Stena Line Ferry Quays Terminal and could also increase the likelihood of a bridge strike on A bridge as traffic seeking access to the terminal ferry could then only route via A bridge.</p>

4.2 Future Transport Related Problems

This section sets out future transport related problems in the context of future travel demand. Consideration is given to the future maintenance requirements for the residual life of A and C bridges, including forecast costs, frequency and duration and the resulting impacts on transport. Information is then provided on the transport related impacts of not undertaking planned maintenance, including an assessment of when weight restrictions are forecast to be required, followed by indicative dates for when full closure of the bridges is anticipated in the context of no intervention.

4.2.1 Future Maintenance Requirements

The AECOM Technical Feasibility Report sets out the future maintenance requirements for A and C bridges in order to maintain their live load carrying capacity of full HA plus 45 Units HB highways loading, allowing for an effective 40 years residual life. The likely future maintenance requirements have been identified based on previous works undertaken by Wirral Council and the existing condition of the bridges.

It is estimated that over the predicted residual life of 40 years, to strengthen and maintain A bridge for full HA and 45 units of HB live loading including the replacement of the walkways for shared pedestrian cycleway usage will cost approximately £4.0M with expected traffic disruptions (including lane closures and full bridge closures with traffic diverted via Duke Street bridge) equivalent to 166 weeks. This includes a sum of £10,800 per year or £432,000 over the 40 year period for Mechanical and Electrical (M&E) works undertaken by Peel Ports. Detailed information on M&E maintenance costs was not available; therefore these M&E costings are assumed to be performed in-house by the Peel Group and are based on typical current commercial rates.

For C bridge, it is not considered necessary to close the full carriageway for all inspections and maintenance works, only one side at each time. In order to maintain full HA and 45 units of HB loading over its 40 year residual life, it is anticipated that the required maintenance works will cost in the region of £1.6m, with approximately 115 weeks of road/lane closures.

It can be seen that a significant level of maintenance will be required in order to maintain the loading capacity of A and C bridges, which is essential to maintaining access through the area for both port and non-port traffic. It is anticipated that the level of inspections and works required will impact negatively on transport in the local area as follows:

- Lane closures will result in localised congestion, leading to increased journey times and journey time variability and associated impacts such as an increase in noise levels and in carbon emissions.
- Full bridge and road closures will lead to lengthy route diversions over Duke Street bridge, causing congestion, increased journey times, a worsening in journey time reliability and associated negative impacts on noise and emissions. Duke Street bridge will require an enhanced maintenance regime as a result of increased traffic flows.
- Inspection and maintenance works will also limit the extent to which pedestrians and cyclists can use the bridges, severing them from opportunities on the other side of the docks.

4.2.2 Future Weight Restrictions and Bridge Closure

Deterioration modelling has been carried out to determine when the main structural elements are predicted to fall below the defined assessment live load, assuming no further maintenance is carried out on the structures over the next 40 years, which is the predicted residual life of the two bridges. Deterioration is difficult to model with certainty; therefore Optimistic and Pessimistic assessment approaches were adopted. It should be noted that 'no further maintenance' is defined as no regular planned maintenance of the structure; however statutory inspection and assessment as well as emergency works due to impacts will still be required.

It is important to note that a progressive collapse assessment has not been taken into account. Once a member fails due to deterioration, the load is likely to distribute amongst other members, increasing their load effects. These other members would then fail at an earlier time than predicted. Analysis of this collapse mechanism was beyond the scope of the Technical Feasibility Study; however it should be noted that there is potential for progressive and even sudden collapse if critical members are not replaced.

4.2.2.1 A Bridge

A bridge was assessed both for its static (bridge is open to traffic with full live load) and dynamic (bridge is in its two lifting positions) states. Currently, the bridge has sufficient capacity to support 40 tonnes HA loading and up to 34 units of HB loading. The pessimistic predictions reveal that, without replacement or structural maintenance:

- In 2014 the bridge will need to be restricted to certain abnormal loads and pedestrian crowds;
- By 2030 a HGV restriction will be required;
- By 2046 the structure will need to be restricted to cars only; and
- By 2051 it will need to be closed to all traffic.

4.2.2.2 C Bridge

Currently, the bridge has sufficient capacity to support 40 tonnes HA loading and up to 40 units of HB loading. The pessimistic predictions reveal that, without replacement or structural maintenance:

- The bridge will need to be restricted to certain abnormal loads and pedestrian crowds by 2014;
- By 2040 a HGV restriction will be required;
- By 2050 the bridge will need to be restricted to cars only; and
- By 2056 it will need to be closed to all traffic.

4.3 Underlying Drivers or Causes

It is important that the underlying drivers or causes of the issues are fully understood in order that the potential solutions identified address the real underlying causes of the transport related problems, rather than simply responding to the symptoms. In the case of the A and C bridges, the key cause of the problems identified is that the bridges present a significant maintenance liability both now and in future. In

addition, the provision for both motorised and non-motorised users across both bridges does not meet current design standards, several of which are considered to pose significant safety concerns.

Without a planned maintenance programme being put in place (that includes strengthening work to full capacity and maintenance of the bridges to maintain capacity at that level) or bridge replacement, weight restrictions will need to be applied to both A and C bridges over the medium term, followed by full closure over the longer term. It is considered that the road closures and associated traffic diversions required for the necessary maintenance activities present a significant issue for local road users, a situation that will be compounded in the context of a future increase in the demand for travel as a result of Wirral Waters and anticipated local housing development.

5 Scheme Objectives

5.1 Rationale for Investment

Based on the issues identified in Section 4 and the opportunities outlined in Section 2.6, our rationale for investment is threefold:

1. **High quality and efficient infrastructure is required to enable the ongoing regeneration and growth of Wirral** – Wirral Waters (which together with Liverpool Waters forms the largest regeneration project in the country), SuperPort and the wider Wirral Enterprise Zone offer significant opportunities to local people and will in future be key drivers of the local and regional economy. The implementation of weight restrictions and eventual bridge closure will compromise the economic success of these schemes and prevent local people from accessing the estimated 20,000 employment opportunities that will be created. In addition, inefficient road networks and the resulting congestion and unreliable journey times will deter investors and could compromise the attractiveness of the area, limiting its potential growth.
2. **Continuing a programme of ongoing, costly maintenance may not be an efficient use of limited resources** – it is recognised that maintenance activities have a negative impact on the local highway network and freight network due to the increasing number of lane and road closures required, causing congestion, delays, increased journey times and increases in traffic-related carbon emissions.
3. **We must improve accessibility across the docks for pedestrians and cyclists** - The bridges do not currently offer safe provision for pedestrians and cyclists and enhanced facilities are needed to enable an increase in the level of sustainable travel in the context of regeneration and to accommodate increased demand for active travel.

5.2 Scheme Objectives

Based on the rationale for investment, a two level hierarchy of objectives has been developed, which provide a framework for future appraisal and evaluation of the scheme. The strategic objectives reflect wider policy ambitions such as economic development that transport contributes to either directly or indirectly. The operational objectives relate specifically to what the scheme will address with respect to the two bridges.

The strategic objectives are as follows:

- To support the regeneration and development activity taking place in the local area and wider City Region, through the provision of an efficient, well-functioning transport system that enables the effective, sustainable movement of people and goods.
- To support the implementation of Wirral Council's Core Strategy Policies CS2, 4, 5, 12, 16 and 41.
- To contribute to each of the Priorities identified by the LEP (Low Carbon Economy, Knowledge Economy, Visitor Economy and SuperPort).
- To contribute to each of the six objectives set out in the LCR LTP3.

Under the Traffic Management Act 2004 (TMA) Wirral Council has a duty (as far as is reasonably practicable) to secure the expeditious movement of traffic on the Authority's road network. The operational objectives of the scheme are therefore:

- To keep the A554 corridor open to traffic over the longer term, particularly for freight traffic given that the corridor is part of the Merseyside Freight Network.
- To reduce the level of lane/road closures and traffic diversions associated with the operation and maintenance of the two bridges, in order to improve journey time reliability and maintain continued access across the docks for vehicular traffic, pedestrians and cyclists.
- To improve provision for pedestrian and cyclists along the A554 corridor.
- To improve safety for vehicular traffic along the A554 corridor in terms of providing a route that complies with current design standards.

5.3 Scheme Outcomes

By achieving each of the objectives set out above, we will achieve a number of outcomes, which will benefit not only the local area but also the wider City Region:

- The efficient movement of people and goods - to support major projects such as Wirral Waters and SuperPort and to help lever in additional inward investment into the local area and wider City Region.
- Vehicle journey time and journey time reliability improvements – reductions in the lane/road closures and associated traffic diversions associated with maintenance activities will help to reduce journey times and associated issues of congestion and improve overall journey time reliability.
- Improved travel options for local people – the use of active modes of travel for cross docks journeys will become much more attractive. Journeys made on foot or by bike will be safer and the use of active modes will become a more realistic travel option for cross dock journeys, not only benefitting existing pedestrians and cyclists but also encouraging others to travel more sustainably.
- Reduced severance and improved access to opportunity – fewer bridge and lane closures associated with planned and emergency maintenance activities will help to improve connectivity and accessibility across the docks for vehicle users, pedestrians and cyclists and also improve journey time reliability, opening up new opportunities that were previously inaccessible.
- Improvements to safety for cross-docks travel - for vehicle users as a result of a reduced likelihood of bridge strikes and also for pedestrians and cyclists through enhanced provision for active travel.
- Improved health and wellbeing for local residents – improved opportunities for active travel and improved air quality will enhance health, wellbeing and overall quality of life.
- Air quality improvements – reductions in the frequency and duration of lane/road closures and associated traffic diversions associated with maintenance activities will help to improve local air quality through reductions in journey distances and reductions in queuing traffic.
- Reductions in noise pollution – as a result of reductions in queuing traffic.
- A new equitable Bridge Operating Agreement - between Wirral Council and Peel Group.

6 Options Long List

6.1 Options Considered

Based on the existing condition of the bridges and the forecast future maintenance requirements and in the context of the significant regeneration proposals associated with Wirral Waters, a long list of nine scheme options has been developed following consultation with Peel Group.

These are as follows:

1. Do Nothing: No planned maintenance works on either bridge with statutory General and Principal Inspections and emergency works only.
2. Do Minimum: Undertake a planned maintenance programme for both bridges to enable the structures to safely provide for 40 tonne live load capacity and 45 Units HB capacity and 5kN/m² pedestrian loading capacity as set out in the Technical Feasibility Report – acknowledging that weight restrictions and eventual closure will in future be required.
3. Do Something 1: Replacement of A bridge with a new lifting bridge structure and replacement of C bridge with a new static bridge structure.
4. Do Something 2: Replacement of A bridge with a new lifting bridge structure and replacement of C bridge with a causeway.
5. Do Something 3: Replacement of A bridge with a new static bridge structure and replacement of C bridge with a causeway.
6. Do Something 4: Planned maintenance works for A bridge as set out in the Technical Feasibility Report and replacement of C bridge with a causeway.
7. Do Something 5: Planned maintenance works for A bridge as set out in the Technical Feasibility Report and replacement of C bridge with a new static bridge structure.
8. Do Something 6: Replacement of A bridge with a new lifting bridge structure and planned maintenance works for C bridge as set out in the Technical Feasibility Report.
9. Do Something 7: Replacement of A bridge with a new static bridge structure and planned maintenance works for C bridge as set out in the Technical Feasibility Report.

This long list of options then underwent an initial sifting process as set out in Section 6.2 below.

6.2 Initial Sifting

The DfT requires scheme sponsors to provide clear justification for the preferred modal or multi-modal solution, with evidence that demonstrates that the process is consistent with tools such as EAST (DfT's Early Assessment and Sifting Tool) or equivalent which provides relevant, high level information to help inform an early view of how options perform and how they compare.

The benefit of using tools such as EAST to appraise the different scheme options is that it enables an assessment to be undertaken covering all modes and can also be used to assess individual options, packages, strategies and plans. The issues contained within the assessment process are also consistent with transport business case principles that then link seamlessly with the following stages of the MSBC process.

Each of the nine options set out above underwent initial assessment using EAST. The full results are provided in Appendix A and a summary is provided in Table 6.1. A simplified Red/Amber/Green rating has been used for many of the parameters in order to best visually represent the results of the full assessment. Further detail on the structural considerations associated with each of these options is provided in the Technical Feasibility Report. It should be noted that some of the options considered are very similar; therefore for some options only the differences between that option and other options have been recorded in full to avoid unnecessary repetition.

It was found that the 'Do Nothing' option effectively represents a scenario that is worse than the existing situation. Without the necessary maintenance activities, in the short to medium term the bridges would need to close on safety grounds, removing the A554 Tower Road as a route for cross-docks travel for both freight and non-freight travel. The impacts from this would be significant; including increases in vehicle distances travelled and associated congestion and impacts on noise and air quality, detrimental impacts on commercial shipping operations and increasing the maintenance liability on alternative routes. In addition, the closure of this route would compromise the future success of Wirral Waters and other developments and limit the ability of the local area to attract inward investment. Therefore it was decided that this option would not be taken forward for further assessment.

The Do Minimum option effectively represents the existing situation, where a planned programme of maintenance is carried out to retain the full use of both A and C bridges for as long as possible to keep the route open to traffic and also maintain the lifting capacity of A bridge in order for vessels to continue to access the East Float. Although the existing bridges are considered to be life expired by 2018, a comprehensive maintenance programme as set out in detail in the Technical Feasibility Report may help to remove the requirement for weight restrictions to be applied in the short to medium term and also delay the date at which bridge closure is required. Although there are some uncertainties regarding potential future progressive collapse that has not been fully accounted for in the deterioration modelling, this option will be taken forward for further assessment in order to appraise its costs and benefits in more detail and to provide comparison with the short list of 'Do Something' options.

High level assessment of the 7 'Do Something' options revealed that all carry differing combinations of costs, benefits, uncertainties and technical considerations. Following review of the Technical Feasibility Report, it was found that the options that include the replacement of C bridge with a causeway are not feasible in construction terms due to the need to modify the culvert that is used to maintain the water level in the East Float. There are no significant additional benefits offered by replacing the existing bridge with a causeway rather than a static bridge and, although a partial causeway is expected to represent the lowest cost option for replacement, a new bridge deck would offer clear distinction of ownership, reducing possible conflict in future. Those options which include a static bridge replacement option for A bridge were also discounted due to the immediate significant detrimental impact on commercial port operations and the severe limitations placed on economic growth and development in the local area. Therefore the three options of 'Do Something 1', 'Do Something 5' and 'Do Something 6' were taken forward for more detailed assessment.

Table 6.1: Summary of Initial Options Assessment

Option	Description	Policy Fit	Stakeholder/ Public Acceptability	Economic Impact	Environmental Impact	Social Impact	Timescale	Key Risks/ Uncertainties	Approx. Outturn Cost to Implement*	Further Assessment (Y/N)
Do Nothing	No planned maintenance on A or C bridge - statutory inspections & emergency works only.	Red	Red	Red	Red	Red	1-6 months	Early closure	N/A	N
Do Minimum	Planned maintenance on A & C bridges over a 60 year period.	Yellow	Yellow	Yellow	Yellow	Yellow	1-6 months	Early closure	N/A	Y
Do Something 1	Replace A bridge with a lifting structure & replace C bridge with a static structure.	Green	Yellow	Green	Green	Green	2-5 years	Planning consents, environmental uncertainties & stakeholder acceptance	£6m	Y
Do Something 2	Replace A bridge with a lifting bridge and replace C bridge with a causeway.	Green	Yellow	Green	Yellow	Green	2-5 years	Planning consents, environmental uncertainties, stakeholder acceptance & culvert modifications	£6m	N
Do Something 3	Replace A bridge with a static bridge and replace C bridge with a causeway.	Red	Red	Red	Yellow	Green	2-5 years	Planning consents, environmental uncertainties, stakeholder acceptance & culvert modifications	£6m	N
Do Something 4	Planned maintenance of A bridge & replace C bridge with a causeway.	Yellow	Yellow	Yellow	Yellow	Yellow	2-5 years	Planning consents, environmental uncertainties, stakeholder acceptance & culvert modifications	£2.5m	N
Do Something 5	Planned maintenance of A bridge and replace C bridge with a static	Yellow	Yellow	Yellow	Yellow	Yellow	2-5 years	Planning consents, environmental uncertainties &	£2.5m	Y

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Options Appraisal Report



Option	Description	Policy Fit	Stakeholder/ Public Acceptability	Economic Impact	Environmental Impact	Social Impact	Timescale	Key Risks/ Uncertainties	Approx. Outturn Cost to Implement*	Further Assessment (Y/N)
	structure.							stakeholder acceptance		
Do Something 6	Replace A bridge with a lifting structure & planned maintenance of C bridge.						2-5 years	Planning consents, environmental uncertainties & stakeholder acceptance	£3.8m	Y
Do Something 7	Replace A bridge with a static bridge and planned maintenance of C bridge.						2-5 years	Planning consents, environmental uncertainties & stakeholder acceptance	£3.8m	N

*Costings are indicative only at this stage to enable high level comparison of options

7 Options Development and Assessment

7.1 Assessment Options

Initial assessment of the long list of potential scheme options using EAST identified four potential scheme options that required more detailed assessment in order to identify and provide robust justification for the preferred option as follows:

1. Do Minimum – carry out a planned maintenance programme on both A and C bridges.
2. Do Something 1 – replace both A and C bridges with a lifting bridge structure and static bridge structure respectively.
3. Do Something 5 – maintain A bridge and replace C bridge with a static bridge structure.
4. Do Something 6 – replace A bridge with a lifting bridge structure and maintain C bridge.

The following sections set out the methodology and results of both the economic assessment and wider assessment undertaken for each of the Do Something options compared to the Do Minimum option. The full Economic Assessment Report is provided in Appendix B.

7.2 Economic Assessment

This economic assessment has been carried out with reference to the Department for Transport's Transport Appraisal Guidance (WebTAG). This assessment also accounts for a number of relevant simplifying assumptions based on local evidence adopted specifically to produce a robust assessment for the three options that are consistent with local evidence for consideration. This assessment is based on model outputs from the East Wirral Traffic Model (EWTM).

The transport economic assessment was undertaken using the TUBA (Transport Users Benefit Assessment) programme which carries out economic assessment in accordance with published DfT guidance (WebTAG Unit A1.3). This is based on trip and cost matrices from the EWTM and travel cost changes implied by the proposed schemes.

Full details of the methodology and assumptions used in both the initial and revised assessments are provided in Appendix B.

7.2.1 Initial Economic Assessment – Methodology and Results

The initial economic assessment as reported in the draft OAR issued to project partners on 24th September 2014 was carried out over 60 years, during which two different scenarios were considered:

- The existing bridges are maintained - first 40 years of assessment; and
- The existing bridges have come to the end of their design life and are no longer operational – the last 20 years of assessment.

The options assessed were:

- Do Minimum - carry out the planned maintenance programme on both A and C Bridges as detailed in the Technical Feasibility Report for 40 years and A and C Bridges are closed for the last 20 years;

- Do Something 1 – replace both A and C Bridges;
- Do Something 5 – maintain A Bridge and replace C Bridge for 40 years and A Bridge is closed for the last 20 years; and
- Do Something 6 – replace A Bridge and maintain C Bridge for 40 years and C Bridge is closed for the last 20 years.

Table 7.1 summarises the outcome of the assessment for each of the three Do Something options compared to the Do Minimum option for the initial economic assessment. It should be noted that the Benefit Cost Ratio (BCR) of each of the three Do Something options was calculated in comparison to the Do Minimum option; therefore the Do Minimum option does not itself have a BCR.

Table 7.1: Appraisal summary (over 60 years) – Initial Economic Assessment

	DS1: Replace A & C	DS5: Maintain A & Replace C	DS6: Replace A & Maintain C
Do-Minimum Costs (£000s) in 2014 prices	£5,662	£5,662	£5,662
Scheme Costs (£000s) in 2014 prices*	£8,668	£7,202	£7,128
Net Costs (£000s) discounted to 2010	£3,038	£1,720	£1,581
Net Benefits (£000s) discounted to 2010	£31,884	£5,072	£7,802
Benefit to Cost Ratio (BCR)	10.50	2.95	4.93

* All costs include optimism bias of 30% as presented in the Technical Feasibility Report. Under WebTAG guidance a 23% optimism bias is required; thus this represents a more robust assessment in this respect

Note – all figures in Table 7.1 are subject to change as refinements to the modelling approach are undertaken

All three Do Something schemes showed high or very Value for Money based on DfT criteria. Do Something 1, which comprises the replacement of both A and C bridges was identified as providing the highest benefits, with a calculated BCR of 10.5. Do Something 6, which comprises the replacement of A bridge and planned maintenance of C bridge, had the next highest BCR of 4.93 and Do Something 5, which comprises the planned maintenance of A bridge and the replacement of C bridge had the lowest BCR of the options considered, at 2.95.

7.2.2 Revised Economic Assessment – Methodology and Results

The economic assessment results presented in the draft OAR were discussed at a Project Board meeting held on 30th September 2014, at which Peel expressed concerns over the assumption that the bridges can only be maintained for a further 40 years, after which time they are closed to all traffic for the remaining 20 years of the 60 year assessment period. It was agreed that refinements to the modelling approach would be made to reflect a 60 year maintenance period and that the results would be reported in an updated version of the OAR. Additional information on costings was provided by AECOM to facilitate this revised assessment.

The revised economic assessment considered the following options:

- Do Minimum - carry out the planned maintenance programme on both A and C Bridges as detailed in the Technical Feasibility Report for 60 years;

- Do Something 1 – replace both A and C Bridges;
- Do Something 5 – maintain A Bridge and replace C Bridge; and
- Do Something 6 – replace A Bridge and maintain C Bridge.

Table 7.2 summarises the outcome of the revised assessment for the three scheme options.

Table 7.2: Appraisal summary (over 60 years) – Revised Economic Assessment

	DS1: Replace A & C	DS5: Maintain A & Replace C	DS6: Replace A & Maintain C
Do-Minimum Costs (£000s) in 2014 prices	£7,845	£7,845	£7,845
Scheme Costs (£000s) in 2014 prices*	£8,020	£8,570	£7,295
Net Costs (£000s) discounted to 2010	£2,836	£1,521	£1,303
Net Benefits (£000s) discounted to 2010	£16,770	£6,611	£10,141
Benefit to Cost Ratio (BCR)	5.91	4.35	7.78

* All costs include optimism bias of 30% as presented in the Technical Feasibility Report. Under WebTAG guidance a 23% optimism bias is required; thus this represents a more robust assessment in this respect

* The costs in the do-minimum scenario do not include M&E maintenance as robust information was not available

Note – all figures in Table 7.2 are subject to change as refinements to the modelling approach are undertaken

7.2.2.1 Economic Benefits for Do Something 1: Replace A and C Bridges

Table 7.2 shows that DS1 is forecast to deliver a present value of transport economic benefits (PVB) of **£16.8m** where the scheme is assumed to produce benefits over the standard assessment period of 60 years for infrastructure schemes of this size. When the PVB is taken together with the present value of scheme costs (PVC) of **£2.8m** the BCR is calculated as **5.91**. According to Department for Transport Guidance, the BCR of 5.91 represents **very high Value for Money**.

7.2.2.2 Economic Benefits for Do Something 5: Maintain A Bridge and Replace C Bridge

Table 7.2 shows that DS5 is forecast to deliver a present value of transport economic benefits (PVB) of **£6.6m** where the scheme is assumed to produce benefits over the standard assessment period of 60 years for infrastructure schemes of this size. When the PVB is taken together with the present value of scheme costs (PVC) of **£1.5m** the BCR is calculated as **4.35**. According to Department for Transport Guidance, the BCR of 4.35 represents **very high Value for Money**.

7.2.2.3 Economic Benefits for Do Something 6: Replace A Bridge and Maintain C Bridge

Table 7.2 shows DS6 is forecast to deliver a present value of transport economic benefits (PVB) of **£10.1m** where the scheme is assumed to produce benefits over the standard assessment period of 60 years for infrastructure schemes of this size. When the PVB is taken together with the present value of scheme costs (PVC) of **£1.3m** the BCR is calculated as **7.78**. According to Department for Transport Guidance, the BCR of 7.78 represents **very high Value for Money**.

7.2.3 Summary

The economic benefits of three Do Something options for Wirral Docks Bridges have been calculated based on currently available information and in line with WebTAG guidance and compared against a Do Minimum option. The economic assessment work and associated transport modelling have been undertaken to inform the options assessment process and are subject to further refinement during subsequent stages of the assessment.

It is noted that all three scheme options show very high Value for Money based on DfT criteria.

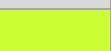
The current analysis provides an indication of likely economic benefits and BCRs, and shows that Do Something 6 (replace A bridge and maintain C bridge) would provide the highest benefits, with a calculated BCR of 7.78; followed by Do Something 1 (replace both A and C bridges), with a BCR of 5.91; followed by Do Something 5 (maintain A bridge and replace C bridge), with the lowest BCR of the options assessed at 4.35. It is noted that the replacement of A bridge forms part of the two options with the highest BCRs.

7.3 Wider Assessment

The economic assessment set out above provides an initial BCR for each of the three Do Something options compared to the Do Minimum option. Evaluation of the BCR of each option in isolation cannot be used to identify the preferred option, as an option can be assessed as generating very high Value for Money but may not be deliverable or may carry unacceptable risks. Therefore wider assessment of the Do Minimum option and the three Do Something options has been undertaken using the Option Assessment Framework set out in 'Transport Analysis Guidance: The Transport Appraisal Process' published by the DfT in January 2014. This assessment considers the following as part of a holistic approach to scheme appraisal:

- Strategic fit with local and regional policy and the degree of fit with identified scheme objectives;
- Economic, environmental, social and distributional impacts;
- Scheme costs;
- Deliverability; and
- Commercial assessment.

Table 7.3 to Table 7.11 detail the results of this assessment, which unless stated otherwise uses a seven point scale as follows:

Large adverse	
Moderate adverse	
Slight adverse	
Neutral	
Slight beneficial	
Moderate beneficial	

Large beneficial



In order to calculate the Net Present Value and Broad Transport Costs, the 60 year costs and benefits have been used (from TUBA), discounted to 2010 prices.

Further information on how each option performs with respect to the Transport Business Case criteria is provided in the EAST assessment contained in Appendix A.

Table 7.3: Option Assessment Framework (Strategic Fit)

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
Regional Transport and Spatial Strategy and local objectives fit					
Regional Policy Alignment	Liverpool City Region (LCR) Growth Deal (2014) LCR Strategic Economic Plan (SEP) (2014) LCR Economic Review (2012) LCR Employment and Skills Strategy and Commissioning Framework (2010) Merseyside Local Transport Plan 3 (2011)	Slight adverse	Moderate beneficial	Slight adverse	Slight beneficial
Local Policy Alignment	Wirral Council Local Plan Core Strategy (Submission Draft 2012) Wirral Network Management Plan	Moderate adverse	Moderate beneficial	Moderate adverse	Slight beneficial
Meeting intervention objectives – addressing problems and challenges					
Scheme Objectives Fit	<u>Strategic Objectives:</u> <ul style="list-style-type: none"> ■ Support regeneration and development in the local area and wider LCR. ■ Support the implementation of Core Strategy Policies CS2, 4, 5, 12, 16 and 41. ■ Contribute to each of the LEP priorities. ■ Contribute to LCR LTP3 objectives. <u>Operational Objectives:</u> <ul style="list-style-type: none"> ■ Keep the A554 corridor open to traffic. ■ Reduce the level of lane/road closures and traffic diversions associated with maintenance. ■ Improve provision for pedestrians and cyclists. ■ Improve safety for vehicular traffic. 	Slight adverse	Large beneficial	Moderate adverse	Slight beneficial

Table 7.4: Option Assessment Framework (Value for Money) – a) Impact on the Economy

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
Business users and transport providers	Outline design Modelling outputs provide an indication of the Present Value of Benefits	Slight adverse	Slight beneficial	Slight adverse	Slight adverse
Reliability	Outline design Qualitative assessment of the existing and future maintenance liability associated with each option	Moderate adverse	Large beneficial	Moderate adverse	Moderate adverse
Regeneration	Qualitative assessment of the change in accessibility to	Moderate adverse	Large beneficial	Moderate adverse	Moderate adverse

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
	jobs				
Wider impacts	Qualitative assessment of impacts on employment and job creation and GVA	Slight adverse	Moderate beneficial	Slight adverse	Slight adverse

Table 7.5: Option Assessment Framework (Value for Money) – b) Impact on the Environment

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
Noise	Traffic flow data used in the traffic modelling	Neutral	Neutral	Neutral	Neutral
Air quality	Outline environmental appraisal in the AECOM Technical Feasibility Report	Slight adverse	Slight beneficial	Neutral / slight adverse	Neutral / slight adverse
Greenhouse gases	Outline environmental appraisal in the AECOM Technical Feasibility Report	Slight adverse	Slight beneficial	Neutral / slight adverse	Neutral / slight adverse
Landscape	Outline environmental appraisal in the AECOM Technical Feasibility Report	Neutral	Neutral	Neutral	Neutral
Townscape	Outline environmental appraisal in the AECOM Technical Feasibility Report	Neutral	Neutral	Neutral	Neutral
Historic environment	Outline environmental appraisal in the AECOM Technical Feasibility Report	Neutral	Neutral	Neutral	Neutral
Biodiversity	Outline environmental appraisal in the AECOM Technical Feasibility Report	Neutral	Slight adverse (but could be mitigated through responsible construction techniques)	Slight adverse (but could be mitigated through responsible construction techniques)	Slight adverse (but could be mitigated through responsible construction techniques)
Water environment	Outline environmental appraisal in the AECOM Technical Feasibility Report	Neutral	Slight adverse (but could be mitigated through responsible construction techniques)	Slight adverse (but could be mitigated through responsible construction techniques)	Slight adverse (but could be mitigated through responsible construction techniques)

Table 7.6: Option Assessment Framework (Value for Money) – c) Impact on the Society

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
Non-business users	Outline design Modelling outputs provide an indication of the Present Value of Benefits	Slight adverse	Slight beneficial	Slight adverse	Slight adverse
Physical activity	Outline design Qualitative assessment of walking and cycling catchments	Neutral	Slight beneficial	Neutral	Neutral

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
Journey quality	Outline design Qualitative assessment	Moderate adverse	Slight beneficial	Neutral	Neutral
Accidents	Outline design Qualitative assessment	Slight adverse / moderate adverse	Slight beneficial	Slight adverse	Slight adverse
Security	Outline design Qualitative assessment	Neutral	Neutral	Neutral	Neutral
Access to services	Outline design Qualitative assessment	Slight adverse	Moderate beneficial	Slight beneficial	Slight beneficial
Affordability	Outline design Qualitative assessment	Neutral	Neutral	Neutral	Neutral
Severance	Outline design Qualitative assessment	Slight adverse	Moderate beneficial	Slight beneficial	Slight beneficial
Option values	N/A – none of the options will result in service additions/withdrawals	Neutral	Neutral	Neutral	Neutral

Table 7.7: Option Assessment Framework (Value for Money) – d) Public Accounts

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
Cost to broad transport budget	Indicative scheme costings TUBA assessment	N/A	£2.836m	£1.521m	£1.303m
Indirect tax revenues	Indicative scheme costings TUBA assessment	N/A	£0.800m	£0.278m	£0.522m

Table 7.8: Option Assessment Framework (Value for Money) – e) Distributional Impacts

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
User benefits	High level assessment of potential social and distributional impacts	Slight adverse	Moderate beneficial	Slight beneficial	Slight beneficial
Noise	High level assessment of potential social and distributional impacts	Slight adverse	Slight beneficial	Neutral	Neutral
Air quality	High level assessment of potential social and distributional impacts	Slight adverse	Slight beneficial	Slight adverse	Slight adverse
Accidents	High level assessment of potential social and distributional impacts	Slight adverse	Slight beneficial	Slight beneficial	Slight beneficial
Security	High level assessment of potential social and	Neutral	Neutral	Neutral	Neutral

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
	distributional impacts				
Severance	High level assessment of potential social and distributional impacts	Moderate adverse	Slight beneficial	Slight adverse	Slight adverse
Accessibility	High level assessment of potential social and distributional impacts	Moderate adverse	Moderate beneficial	Slight adverse	Slight adverse
Affordability	High level assessment of potential social and distributional impacts	Neutral	Neutral	Neutral	Neutral

Table 7.9: Option Assessment Framework (Value for Money) – f) Indicative Benefit Cost Ratio

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
Cost to private sector	Indicative scheme costings TUBA assessment	N/A		Unknown at this stage	
Indicative Net Present Value	Indicative scheme costings TUBA assessment	N/A	£13.934m	£5.090m	£8.838m
Indicative economic BCR	Indicative scheme costings TUBA assessment	N/A	5.91	4.35	7.78

Table 7.10: Option Assessment Framework (Financial Case)

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
Capital and Revenue Costs					
Outturn cost to implement	Indicative scheme costings	N/A	£6.320m	£2.570m	£3.750m
Operating and maintenance costs	Indicative scheme costings	£7.845m	£1.500m	£5.900m	£3.445m
Funding Assumptions					
Funding allocation	Assessment of available funding sources	Funding may be available for this option depending on its performance against the other assessment criteria	Identified in the Merseyside Major Schemes Programme as a prioritised scheme for Local Growth Funding	Funding may be available for this option depending on its performance against the other assessment criteria	Funding may be available for this option depending on its performance against the other assessment criteria

Table 7.11: Option Assessment Framework (Delivery Case)

Assessment Areas	Assessment Method / Key Input Data	Do Minimum	Do Something 1	Do Something 5	Do Something 6
Likely delivery agents	Outline scheme information Professional expertise	Wirral Council Peel Group	Wirral Council Peel Group	Wirral Council Peel Group	Wirral Council Peel Group
Stakeholder acceptability (Low, Medium, High)	Initial discussions with key stakeholders	Medium	High	Low	Low
Public acceptability / interest	Qualitative assessment of intervention option impacts and their distribution	Medium	High	Low	Low

7.4 Preferred Option

The results of the BCR assessment and the wider assessment have been considered in the context of the deliverability and acceptability of each scheme in practical terms based on the existing issues associated with the bridges as set out in Section 4.1.1.

The preferred option has been identified as Do Something 1 – replace both A and C bridges, for the following key reasons:

- The initial BCR that has been calculated for this option is 5.91, which represents very high Value for Money according to DfT criteria.
- Of the three Do Something options considered, Do Something 1 aligns most closely with the scheme objectives, in particular:
 - Keeping the A554 corridor open to traffic over the longer term, which forms part of the Merseyside Freight Network;
 - Reducing the level of lane / road closures and traffic diversions associated with bridge maintenance, which will help to improve journey time reliability and maintain continued access across the docks for vehicular traffic, pedestrians and cyclists;
 - Improving provision for pedestrian and cyclists along the A554 corridor; and
 - Improving safety by providing a route that complies with current design standards.
- In practical terms, given the proximity of the bridges to each other and the fact that they form part of the same through route, a scheme which includes the replacement of only one bridge will mean that there will still be significant lane / road closures and traffic diversions associated with ongoing maintenance of the other bridge.
- Of the three Do Something options considered, Do Something 1 performs best against wider economic, environmental and social criteria, in particular supporting regeneration in the local area and in terms of meeting local and City Region objectives around accessibility, safety and journey quality.
- The replacement of both bridges provides the opportunity to address sub-standard features that currently pose a safety threat and restrict accessibility in the local area, including:
 - Headroom constraints, which restrict the movement of high loads in the port area and which also carry the risk that a major vehicular collision could render either bridge at risk of catastrophic collapse as they are statically determinate;
 - Paint system – the replacement of the existing lead based paint system is considered to be desirable if not essential in the short to medium term. Failure to address this will result in progressive deterioration of structural members and connections;
 - The detailing of the structures is not compliant with modern methods for preventing the collection of debris which can initiate corrosion;
 - The properties of the steel used are unlikely to meet the requirements of modern standards;
 - Impact protection (either from road vehicles or ships) is not to current standards;

- The fatigue loading history of the structures is largely unknown and future increased traffic volumes will increase the fatigue spectrum;
 - The moving structures themselves do not meet current requirements in terms of health and safety legislation; for example, access to crush zones and moving parts are not sufficiently guarded and would be difficult to guard; and
 - The pedestrian footways are in poor condition and fail in 2014 for the normal highway design loading for footways on bridges.
- A new flat deck bridge at the C bridge site would offer flexibility in terms of improved access or increased surface available for adjacent development on the dock estate.

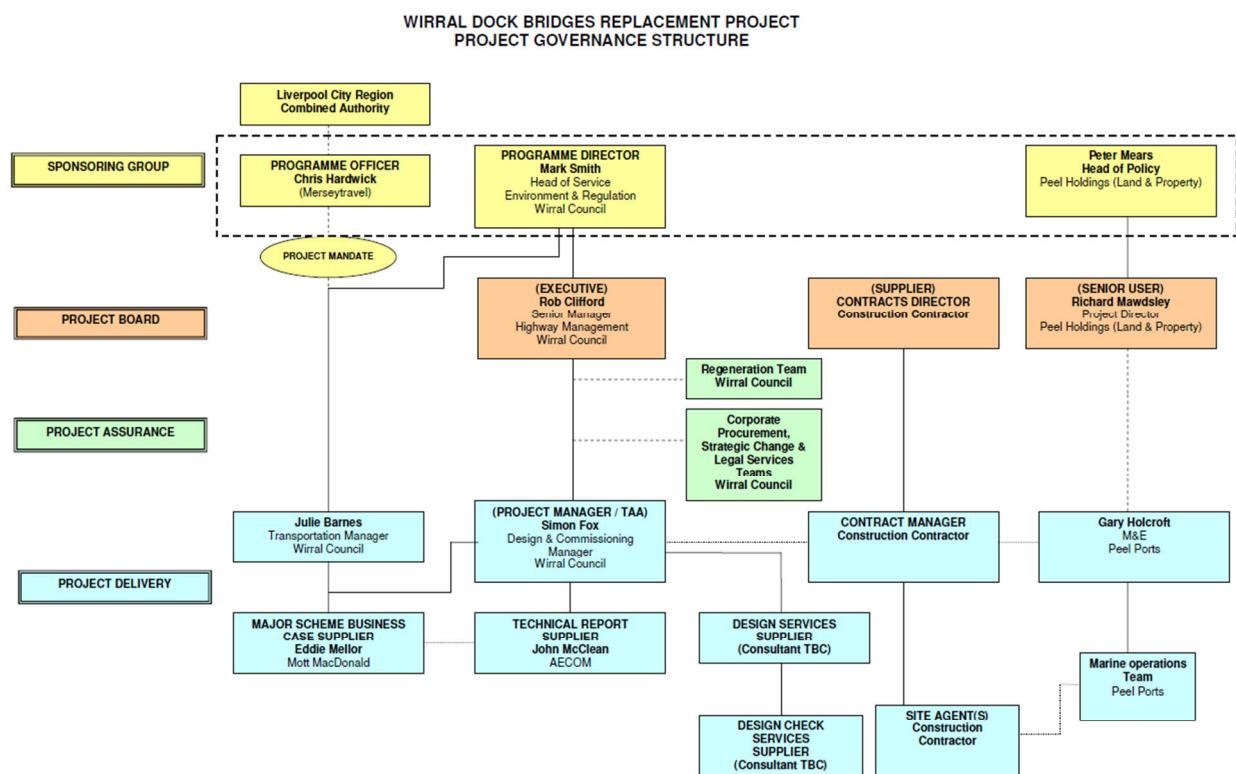
Further economic assessment of the preferred option will be undertaken as part of the Outline Business Case, alongside additional social, distributional, environmental and financial assessment.

8 Project Delivery

8.1 Project Governance

The Project Board will provide the necessary ownership, governance and strategic direction and ensure that all project objectives, outputs and outcomes are achieved within agreed budgets and timescales. It follows a four tier structure as shown in Figure 8.1, comprising representatives from Wirral Council, Merseytravel, Peel, Mott MacDonald and design/construction consultants (once appointed). The Project Board meets on a regular basis, currently quarterly but more often as required, to ensure that all aspects of the project are being delivered to the agreed standard and that any issues or potential delays are identified, communicated and mitigated as early as possible.

Figure 8.1: Project Governance Structure



Source: Wirral Council

The Project Manager is responsible for the day-to-day running of the project in accordance with the Council's project management handbook, based on PRINCE2 project management principles, using the Concerto web-based project management tool. The project will be monitored by the project assurance teams from the Council's Transformation & Resources Strategic Directorate via Concerto. Issues will be resolved on a sub-project level and reported by exception to the Project Board.

8.2 Project Funding

Wirral Council is committed to the regeneration of the Wirral docklands area through the Wirral Waters Enterprise Zone and to the revitalisation and development of Birkenhead town centre, as clearly set out in the Draft Local Development Framework. The bridges are strategically important pieces of infrastructure and the Council is currently exploring every possible option to fund the local contribution required, including future capital settlements through the Local Transport Plan process for Highway Capital Maintenance and Integrated Transport; Enterprise Zone funding using the business rate uplift; and the Council's capital programme.

Table 8.1 below shows indicative capital costings for the preferred scheme option. As the owner and operator of A bridge, Peel Ports is expected to make a significant capital contribution towards the agreed replacement structure under the current operating agreement held between Peel Ports and Wirral Council. In addition, the Sustainable Transport Fund, which will be established as a result of the Wirral Waters Section 106 Agreement between Wirral Council and Peel and funded through the agreed transport tariff, is expected to contribute to improvements to pedestrian and cycle linkages across Four Bridges / Tower Road. These two elements are shown individually in Table 8.1 below.

Table 8.1: Indicative Preferred Scheme Costings

Funding Source	2016/17	2017/18	Total
LGF Contribution Sought	0.9	3.43	4.33
Local Contribution (Wirral Council)		0.67	0.67
Third Party Contribution (Peel Ports) – Sustainable Transport Contribution Tariff under the Wirral Waters East Float S106 Agreement		0.41	0.41
Third Party Contribution (Peel Ports) – under the existing Operating Agreement for A bridge held with Wirral Council		1.33	1.33
Total Capital Scheme Cost	0.9	5.8	6.74

Note: 2.6% per annum has been used as the current industry standard for construction inflation and 2012 base year construction costs have been extrapolated accordingly to derive a total allowance for inflation assuming construction in 2017/2018

8.3 Proposed Project Programme and Risk Management

Figure 12.1 in the attached Technical Feasibility Report provides an outline programme to design, tender for and construct the two replacement bridges. The majority of the detailed design work will be undertaken in 2016, preceded by a period of stakeholder engagement and obtaining the necessary consents during 2015. It is estimated that a period of 4-7 months is required to replace each bridge; and given that the A554 Tower Road provides essential access to the Stena Line Ferry Terminal, both bridges cannot be replaced at the same time. Therefore a period of approximately 14-18 months is required for construction, starting in April 2017 and completing in late summer/early autumn 2018. During construction, temporary traffic management measures will be adopted and water freight movements will be restricted to facilitate

the replacement of A bridge. Outline temporary traffic management information is provided in the Technical Feasibility Report.

Wirral Council will seek to manage the following key risks during the course of the project to prevent delays to the project programme:

- Environmental constraints: should bridge replacement not fall under Permitted Development, an Environmental Assessment will be required as part of the planning application. The identification of contaminated land, flood risk issues and other issues related to habitats could potentially cause significant delays to the project programme.
- Heritage considerations: heritage 'expectations' associated with the removal of the existing bridges and replacement with new bridge structures will need to be carefully managed.
- Commercial impacts – the Stena Line Ferry Terminal is situated between A and C bridges and is accessed directly from the A554 Tower Road. Vehicle access to the port will need to be maintained; therefore a phased construction approach will be adopted with the necessary traffic management measures put in place.

8.4 Preferred Procurement Strategy

The Technical Feasibility Report identifies three potential procurement strategies:

- Design, Tender & Build;
- Design & Build; and
- Public Private Partnership.

Based on the advantages and disadvantages associated with each strategy, a Design, Tender and Build strategy is considered to be the most appropriate at this stage, which will enable phased detailed design and construction and which may help to reduce the commercial impacts on port operations during the construction period.

Appendices

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Appendix A. Full EAST Output

Unique Ref. No.	Overall		Identified problems and objectives of the option	Scale of impact	Fit with wider transport and government objectives	Fit with other objectives	Key uncertainties	Degree of consensus over outcomes?	Economic				Expected VFM Category	Implementation timetable	Public acceptability	Practical feasibility	What is the quality of the supporting evidence?	Key risks	Financial				Flexibility of option	Where is funding coming from?	Any income generated? (Y/N)		
	Name/No.	Date	Description						Economic Growth	Carbon emissions	Socio-distributional impacts and the regions	Local environment							Affordability	Capital Cost (£m)?	Revenue Costs (£m)?	Cost Profile	Overall cost risk	Other costs			
1 Do Nothing	27/08/2014	No planned maintenance activities are carried out on either A or C bridge - statutory General and Principal Inspections and reactive emergency works only.	A and C bridges will be life expired in 2018 and, even with a programme of planned maintenance activities, weight restrictions will in future be required, followed by eventual closure. Therefore the objective of the Do Nothing option is to reduce the maintenance liability held by Wirral Council for the two bridges in light of the fact that, even with maintenance, the bridges will eventually need to close, removing the A554 Tower Road as a route for cross-docks travel.	1. Small impact	1. Low	1. Low	The key uncertainty is when weight restrictions and eventual closure will be required, as although deterioration modelling has been undertaken, bridge strikes and cumulative impacts of individual failure of certain elements may mean that weight restrictions are required earlier than predicted. The pace at which Wirral Waters will develop is also uncertain - and it is unlikely that the bridges will remain in sufficient condition to support its successful development.	5. Majority	1. Red	2. Red/amber	2. Red/amber	2. Red/amber	2. Red/amber	5. Poor <1	2. 1-6 months	2	4	3	The key risk is how decisions are made once weight restrictions and traffic diversions are required - and the impact of those decisions on commercial port operations and on the future economic development of the area. Also the future availability of funding to implement traffic diversions and to carry out the enhanced maintenance required on alternative routes.	4	01. None	02. 0	Costs to local and regional businesses will be significant due to traffic diversions, longer journeys, congestion and the inability to access key commercial entities such as the Stena Line Ferry Terminal.	3	Other costs are unknown at this stage but present a key risk in terms of budgeting for future costs.	Existing funding arrangements between Wirral Council and Peel Group would remain in place.	No
2 Do Minimum-Planned Maintenance	27/08/2014	Undertake a programme of planned maintenance for A and C bridges including the replacement of the walkway for shared pedestrian/cycle usage as detailed in the Technical Feasibility Report prepared by AECOM - with future weight restrictions and traffic diversions as appropriate.	A and C bridges will be life expired in 2018 and a programme of planned maintenance activities will enable the bridges to remain open to all traffic for as long as possible to facilitate cross-docks travel, access for commercial port traffic to local facilities and support the development of Wirral Waters. It should be noted that, even with a programme of planned maintenance, weight restrictions will in future be required, followed by eventual closure of the two bridges which will remove the A554 Tower Road as a route for cross-docks travel.	3	3	3	A key uncertainty is how long this option can be pursued before weight restrictions and/or closure is required. Deterioration modelling has been carried out; however this does not account for cumulative impacts of failure or closures and restrictions due to bridge strikes. Maintaining public safety will be the key concern.	3	3. Amber	6. No Impact	6. No Impact	6. No Impact	6. No Impact	5. Poor <1	2. 1-6 months	3	4	3	The key risk is in accurately predicting when weight restrictions will be required and also in future uncertainties - for example a catastrophic bridge strike could lead to lengthy closure or even permanent closure that would negate the maintenance activities undertaken to date.	2	03. 10	04. 5	Capital cost estimates are based on technical evidence and are considered to be robust. However, the full extent of costs related to eventual application of weight restrictions and bridge closure is not yet known.	2	Maintenance costs have been predicted with as much accuracy as possible; however a catastrophic bridge strike or similar may change these substantially in the future.	The existing arrangement between Wirral Council and Peel Group may continue in terms of funding the necessary maintenance activities; however it is likely that the amount of funding required will exceed that available from Council budgets.	No
3 Do Something 1	27/08/2014	This option comprises the replacement of A bridge with a new lifting bridge structure and the replacement of C bridge with a new static bridge structure. The type of structures to be constructed would be as recommended in the Technical Feasibility Report produced by AECOM with associated costings.	A and C bridges will be effectively life expired by 2018 and replacement with new structures would mean that the A554 Tower Road could remain open to general traffic for cross-docks movement, access to the Stena Line Ferry Terminal and to facilitate the ongoing development of Wirral Waters. The replacement structures would necessitate a much less onerous and lower cost maintenance regime to be put in place, requiring fewer lane/road closures and for much shorter periods, reducing associated impacts on congestion, journey time reliability, noise and air pollution.	4	4	4	It is not yet clear whether replacement of the bridges comprises Permitted Development or whether planning approval is required. There are uncertainties regarding the heritage value of the bridges and potential environmental constraints to construction that will only become apparent through a full environmental appraisal.	3	5. Green	4. Amber/green	4. Amber/green	4. Amber/green	5. Green	3. Medium 1.5-2	5. 2-5 years	3	3	3	These are predominantly planning related; for example planning permission may not be granted so the findings of the full environmental assessment could delay the project programme or compromise the project altogether. There is also a risk that Peel Group does not agree with the proposals for replacement and does not provide the financial contribution required.	2	03. 10	04. 5	Capital cost estimates are based on technical evidence and are considered to be robust.	4	Other costs relating to detailed design, the tender process and the planning process will be borne by Wirral Council.	This option forms part of the list of prioritised schemes as part of the Liverpool City Region Major Schemes Programme. As part-owner of A bridge and the developer of Wirral Waters, Peel Group is expected to make a significant financial contribution.	No
4 Do Something 2	27/08/2014	This option comprises the replacement of A bridge with a new lifting bridge structure and the replacement of C bridge with a causeway.	This option is broadly similar to 'Do Something 1' in terms of the identified problems and objectives. However, C bridge would be replaced with a causeway rather than a replacement bridge structure. A causeway would provide additional space to improve pedestrian and cyclist provision and could also accommodate future widening of the highway.	4	4	4	As per 'Do Something 1'	3	5. Green	4. Amber/green	4. Amber/green	4. Amber/green	5. Green	3. Medium 1.5-2	5. 2-5 years	3	2	3	As per 'Do Something 1' with some additional considerations including the modifications needed to the culvert system.	2	03. 10	04. 5	As per 'Do Something 1'	4	As per 'Do Something 1'	Funding may be available for this option depending on its performance in terms of other assessment criteria.	No
5 Do Something 3	27/08/2014	This option comprises the replacement of A bridge with a new static bridge structure and the replacement of C bridge with a new causeway.	This option is broadly similar to 'Do Something 1' in terms of the identified problems and objectives. However, A bridge would be replaced with a static bridge structure that would keep the route open to general traffic and permit only small vessels to enter the dock. This would be a dis-benefit to local commercial operations but would reduce the maintenance requirements associated with a lifting structure and also eliminate the amount of time that traffic needs to wait for the bridge to lift to enable vessels to enter the dock.	4	4	3	As per 'Do Something 1'	3	3. Amber	4. Amber/green	4. Amber/green	4. Amber/green	5. Green	4. Low 1.5	1. 5-2 years	3	1.	Low	As part-owner and operator of A bridge, Peel Group is highly unlikely to agree to this option being taken forward or to make the required financial contribution due to the severe restrictions placed on commercial port operations and on the future development of Wirral Waters.	2	03. 10	04. 5	As per 'Do Something 1'	4	As per 'Do Something 1'	Funding may be available depending on the options performance against other assessment criteria.	No
6 Do Something 4	28/08/2014	This option comprises planned maintenance of A bridge over its 40 year residual life and the replacement of C bridge with a causeway.	A programme of planned maintenance for A bridge will enable it to remain open to all traffic for as long as possible to facilitate cross-docks travel, access for commercial port traffic to local facilities and support the development of Wirral Waters. The replacement of C bridge with a causeway would enable future improvements in pedestrian and cyclist provision and potential widening of the carriageway. It should be noted that, even with a programme of planned maintenance, weight restrictions will in future be required for A bridge, followed by eventual closure. This would restrict larger vessels from entering the dock and also mean that traffic would need to approach the A554 Tower Road from the south to access the Stena Line Ferry Terminal through the use of C bridge - the route would not remain open as a through route to cross-docks traffic.	2	2	2	Although deterioration modelling has been carried out for A bridge, there are uncertainties regarding when exactly when weight restrictions will be required. In terms of the replacement of C bridge with a causeway, it is not yet clear whether this comprises Permitted Development or whether planning approval is required. There are uncertainties regarding the heritage value of the existing bridge and potential environmental constraints to construction that will only become apparent through a full environmental appraisal.	3	2. Red/amber	2. Red/amber	2. Red/amber	3. Amber	2. Red/amber	5. Poor <1	5. 2-5 years	2	2	2	These include planning risks in terms of gaining the necessary approvals for C bridge, the risk that a catastrophic bridge strike will occur on A bridge that requires it to close earlier than forecast and the risk that Peel Group does not accept this option and does not make the financial contribution required.	2	03. 10	04. 5	As per 'Do Something 1'	2	As per 'Do Something 1'	Funding may be available depending on the performance of the option against other assessment criteria.	No
7 Do Something 5	28/08/2014	This option comprises planned maintenance of A bridge over its 40 year residual life and the replacement of C bridge with a static bridge structure.	As per 'Do Something 4'	2	2	2	As per 'Do Something 4'	3	2. Red/amber	2. Red/amber	2. Red/amber	3. Amber	2. Red/amber	5. Poor <1	5. 2-5 years	2	3	2	As per 'Do Something 4'	2	03. 10	04. 5	As per 'Do Something 1'	2	As per 'Do Something 1'	Funding may be available depending on the option's performance against other assessment criteria.	No
8 Do Something 6	28/08/2014	This option comprises replacement of A bridge with a lifting bridge structure and planned maintenance of C bridge over its 40 year residual life.	A and C bridges will be life expired in 2018 and the main objective is to keep both bridges in operation to support cross-docks movements for freight and non-freight vehicle traffic and to continue to enable larger vessels to access the dock in support of commercial port operations. Replacement of A bridge with a lifting bridge structure will support port operations and the wider development of Wirral Waters. Maintenance of C bridge will prolong the length of time that it can remain open without weight restrictions. However, over the medium to long term, it is likely that C bridge would need to close permanently. In addition, the replacement of A bridge with a static structure would mean that larger vessels associated with commercial port operations are unable to access the dock.	3	3	3	Although deterioration modelling has been carried out for C bridge, there are uncertainties regarding when exactly when weight restrictions will be required. In terms of the replacement of A bridge, it is not yet clear whether this comprises Permitted Development or whether planning approval is required. There are uncertainties regarding the heritage value of the existing bridge and potential environmental constraints to construction that will only become apparent through a full environmental appraisal.	3	4. Amber/green	3. Amber	3. Amber	3. Amber	3. Amber	4. Low 1.5	1. 5-2 years	2	3	3	These are planning related e.g. whether planning approval can be gained (if required) for the replacement of A bridge and also stakeholder related in terms of Peel Group agreeing with this as the most appropriate option and making the financial contribution required. Also a catastrophic event in relation to C bridge could mean that replacement is required during its residual life.	2	03. 10	04. 5	As per 'Do Something 1'	2	As per 'Do Something 1'	Funding may be available depending on the option's performance against other assessment criteria.	No
9 Do Something 7	28/08/2014	This option comprises replacement of A bridge with a static bridge structure and maintenance of C bridge over its 40 year residual life.	A and C bridges will be life expired in 2018 and the main objective is to keep both bridges in operation to support cross-docks movements for freight and non-freight vehicle traffic and to continue to enable larger vessels to access the dock in support of commercial port operations. Replacement of A bridge will reduce the maintenance liability and associated road closures and traffic diversions and maintenance of C bridge will prolong the length of time that it can remain open without weight restrictions. However, over the medium to long term, it is likely that C bridge would need to close permanently. In addition, the replacement of A bridge with a static structure would mean that larger vessels associated with commercial port operations are unable to access the dock.	2	2	2	As per 'Do Something 6'	3	2. Red/amber	3. Amber	3. Amber	3. Amber	3. Amber	5. Poor <1	5. 2-5 years	3	3	3	As per 'Do Something 6'	2	03. 10	04. 5	As per 'Do Something 1'	2	As per 'Do Something 1'	Funding may be available depending on the option's performance against other assessment criteria.	No

Early Assessment and Sifting Tool (EAST) - Expanded Print View

Option Name/No.	Do Nothing
Date	27/08/2014
Description	No planned maintenance activities are carried out on either A or C bridge - statutory General and Principal Inspections and reactive emergency works only.

Strategic

Identified problems and objectives	A and C bridges will be life expired in 2018 and, even with a programme of planned maintenance activities, weight restrictions will in future be required, followed by eventual closure. Therefore the objective of the Do Nothing option is to reduce the maintenance liability held by Wirral Council for the two bridges in light of the fact that, even with maintenance, the bridges will eventually need to close, removing the A554 Tower Road as a route for cross-docks travel.	
Scale of impact	1. Small impact	The option does not address any of the short term problems associated with A and C bridges, including the fact that they do not conform to current design standards, posing a risk to public safety. Provision for pedestrians and cyclists is very poor along the route and would remain so for the foreseeable future. The application of weight restrictions and eventual closure of the bridges would have a significant detrimental impact on the commercial operations of the Stena Line Ferry Terminal and on the future success of Wirral Waters.
Fit with wider transport and government objectives	1. Low	This option provides poor fit with local, City Region and national transport policy in terms of the provision of a robust, efficient transport network, promoting active travel and maintaining public transport-related assets to a high standard.
Fit with other objectives	1. Low	This option provides poor fit with wider policy objectives in terms of facilitating economic development in the Liverpool City Region and facilitating the future success of significant developments such as Wirral Waters and SuperPort.
Key uncertainties	The key uncertainty is when weight restrictions and eventual closure will be required, as although deterioration modelling has been undertaken, bridge strikes and cumulative impacts of individual failure of certain elements may mean that weight restrictions are required earlier than predicted. The pace at which Wirral Waters will develop is also uncertain - and it is unlikely that the bridges will remain in sufficient condition to support its successful development.	
Degree of consensus over outcomes	5. Majority	Wirral Council and the Peel Group are in agreement that this option will not deliver the required outcomes and that the lack of a comprehensive maintenance regime will cause significant safety concerns.

Economic

Economic growth	1. Red	This option performs poorly against economic parameters, including journey times and journey time reliability, the facilitation of new development, connectivity and network resilience due to the eventual future closure of the two bridges to general traffic.
Carbon emissions	2. Red/amber	Fuel consumption and carbon emissions are forecast to rise with this option due to the requirement for vehicles to divert along longer routes when weight restrictions are applied and once the bridges are closed to general traffic. No increase in public transport is anticipated as the route is not located on a major public transport corridor and is a key freight route for local commercial port operations.
Socio-distributional impacts and the regions	2. Red/amber	Increasing bridge closures will effectively sever groups from travelling across the docks along this route and reduce accessibility for all users. In addition, the local area is a major focus for regeneration and the A554 Tower Road is a key corridor through this route.

Local environment	2. Red/amber	There will be a negative impact on air quality as a result of longer vehicle journeys due to traffic diversions. The closure of the bridges will have a negative visual impact on the local landscape.
Well being	2. Red/amber	Significant dis-benefits with respect to wellbeing in terms of the risk of accidents, severance and accessibility, journey times and journey time variability.
Expected VfM category	5. Poor <1	Expected to be poor as there is still a financial outlay associated with this option and the option brings few if any benefits. In addition, the routing of traffic along alternative routes such as Duke Street will have an impact on the maintenance regime required for the Duke Street Bridge.

Managerial

Implementation timetable	2. 1-6 months	A programme of statutory inspections will need to be put in place; however this option is one which can be implemented relatively quickly. There is uncertainty over how long this option can be pursued before an alternative option is required to keep the route open to traffic.
Public acceptability	2	Initially public acceptability may be neutral; however as reactive maintenance activities and associated traffic diversions increase, followed by eventual weight restrictions and closure, congestion and other negative impacts such as noise will increase, which is likely to have a negative impact on public acceptability.
Practical feasibility	4	Wirral Council and Peel Group would retain their current responsibilities with respect to A and C bridges. No other statutory powers are required. However, the option does not provide the opportunity to clarify the existing legal agreements, which are complicated.
What is the quality of the supporting evidence?	3	Bridge inspections and deterioration modelling have been carried out; therefore the evidence relating to the condition of the bridges is considered to be robust.
Key risks		The key risk is how decisions are made once weight restrictions and traffic diversions are required - and the impact of those decisions on commercial port operations and on the future economic development of the area. Also the future availability of funding to implement traffic diversions and to carry out the enhanced maintenance required on alternative routes.

Financial		
Affordability	4	Affordable initially but it should be noted that there are uncertainties associated with the future implementation of this option once the bridges fail.
Capital Cost (£m)	01. None	The Do Nothing option effectively represents less maintenance than is currently carried out; thus there is no capital cost associated with the option.
Revenue Costs (£m)	02. 0-5	Revenue costs are estimated to be approximately £105,000 for statutory inspections over the 40 year residual life of A bridge and £73,000 for C bridge over the same period.
Cost profile		Costs to local and regional businesses will be significant due to traffic diversions, longer journeys, congestion and the inability to access key commercial entities such as the Stena Line Ferry Terminal.
Overall cost risk	3	
Other costs		Other costs are unknown at this stage but present a key risk in terms of budgeting for future costs.

Commercial

Flexibility of option	3	In the short term, planned maintenance activities could be implemented to keep the bridges open for a longer period. However, once the bridges deteriorate past a certain level, permanent closure or replacement will be the only options available.
Where is funding coming from?		Existing funding arrangements between Wirral Council and Peel Group would remain in place.
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - Expanded Print View

Option Name/No.	Do Minimum- Planned Maintenance
Date	27/08/2014
Description	Undertake a programme of planned maintenance for A and C bridges including the replacement of the walkway for shared pedestrian/cycle usage as detailed in the Technical Feasibility Report prepared by AECOM - with future weight restrictions and traffic diversions as appropriate.

Strategic

Identified problems and objectives	A and C bridges will be life expired in 2018 and a programme of planned maintenance activities will enable the bridges to remain open to all traffic for as long as possible to facilitate cross-docks travel, access for commercial port traffic to local facilities and support the development of Wirral Waters. It should be noted that, even with a programme of planned maintenance, weight restrictions will in future be required, followed by eventual closure of the two bridges which will remove the A554 Tower Road as a route for cross-docks travel.	
Scale of impact	3	The planned maintenance programme will help to prolong the length of time that the bridges remain open without weight restrictions. This will have a beneficial impact on local and regional commercial operations and help to support the ongoing development and regeneration in the local area. It will also continue to support cross-docks travel for local people to access employment and services.
Fit with wider transport and government objectives	3	There is some degree of fit with local, regional and transport policy in terms of maintaining a public transport-related asset and supporting a robust, efficient highway network. However, the bridges do not meet current design standards for vehicle traffic. A small improvement to pedestrian and cyclist travel will be seen.
Fit with other objectives	3	Some contribution is made to wider objectives over the short to medium term in terms of maintaining a cross-docks through route essential for commercial port operations and in terms of supporting wider economic development such as Wirral Waters and SuperPort.
Key uncertainties	A key uncertainty is how long this option can be pursued before weight restrictions and/or closure is required. Deterioration modelling has been carried out; however this does not account for cumulative impacts of failure or closures and restrictions due to bridge strikes. Maintaining public safety will be the key concern.	
Degree of consensus over outcomes	3	Wirral Council does not believe that this option represents best Value for Money or will provide the most significant benefits compared to other options. The Peel Group has stated that it would like to see more detailed appraisal of this option through traffic modelling and economic appraisal to determine the extent to which it meets the desired outcomes.

Economic

Economic growth	3. Amber	In the short term the bridges will continue to operate as they do at present, supporting cross-docks travel with routine planned closures for maintenance activities. However, in 2018 the bridges are considered to be life expired and the maintenance liability will increase, requiring more frequent closures for longer periods, with weight restrictions put in place over the medium term, followed by full closure. Once weight restrictions are applied, this will limit the amount of regeneration that can take place in the local area and will have a detrimental impact on significant projects such as Wirral Waters.
Carbon emissions	6. No Impact	There is considered to be little impact on carbon emissions associated with this option over the short to medium term as it effectively represents the status quo situation. However over the longer term there may be notable impacts due to the increasing bridge closures and traffic diversions required.

Socio-distributional impacts and the regions	6. No Impact	There is considered to be little change in socio-distributional impacts associated with this option over the short to medium term as it effectively represents the status quo situation. However over the longer term there may be notable impacts due to the increasing bridge closures and traffic diversions required.
Local environment	6. No Impact	There is considered to be no significant impact on the local environment associated with this option over the short to medium term as it effectively represents the status quo situation. However over the longer term there may be notable impacts due to the increasing bridge closures and traffic diversions required.
Well being	6. No Impact	There is considered to be no significant impact on wellbeing associated with this option over the short to medium term as it effectively represents the status quo situation. However over the longer term there may be notable impacts due to the increasing bridge closures and traffic diversions required.
Expected VfM category	5. Poor <1	It is considered that the financial contribution required to carry out the required maintenance activities will outweigh the benefits achieved as the bridges will eventually need to close, with significant associated impacts on cross-docks accessibility.

Managerial

Implementation timetable	2. 1-6 months	This option effectively represents the status quo; therefore only a short period of time is required to plan and implement short term maintenance activities.
Public acceptability	3	Likely to be neutral over the short term as the status quo will remain. As bridge closures and traffic diversions increase, public acceptability is likely to reduce significantly.
Practical feasibility	4	This option is practical as Wirral Council has maintained the bridges for some years and would continue to do so in the same manner. There may however be issues relating to the shared ownership of A bridge with the Peel Group.
What is the quality of the supporting evidence?	3	The Technical Feasibility Report produced by AECOM sets out the maintenance works required with associated costings. In addition evidence is provided on when weight restrictions will be required. However, it is considered that this option would benefit from more detailed economic appraisal supported by traffic modelling.
Key risks		The key risk is in accurately predicting when weight restrictions will be required and also in future uncertainties - for example a catastrophic bridge strike could lead to lengthy closure or even permanent closure that would negate the maintenance activities undertaken to date.

Financial

Affordability	2	This option requires a substantial capital cost for which funding has not been identified.
Capital Cost (£m)	03. 5-10	The Technical Feasibility Report produced by AECOM states that to maintain A and C bridges for the required live loading will cost circa £3.6m and £1.6m respectively, with 166 weeks of lane/road closures for A bridge and 115 weeks of lane/road closures for their 40 years residual life.
Revenue Costs (£m)	02. 0-5	Unknown at this stage; however a 40 year maintenance programme will likely carry a reasonably substantial revenue cost.
Cost profile		Capital cost estimates are based on technical evidence and are considered to be robust. However, the full extent of costs related to eventual application of weight restrictions and bridge closure is not yet known.
Overall cost risk	2	
Other costs		Maintenance costs have been predicted with as much accuracy as possible; however a catastrophic bridge strike or similar may change these substantially in the future.

Commercial

Flexibility of option	3	Some elements within this option are necessarily flexible due to uncertainties regarding how quickly the condition of the bridges will deteriorate and also if unplanned maintenance activities are required. However, without the necessary maintenance, the bridges will need to close on safety grounds.
Where is funding coming from?		The existing arrangement between Wirral Council and Peel Group may continue in terms of funding the necessary maintenance activities; however it is likely that the amount of funding required will exceed that available from Council budgets.
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - Expanded Print View

Option Name/No.	Do Something 1
Date	27/08/2014
Description	This option comprises the replacement of A bridge with a new lifting bridge structure and the replacement of C bridge with a new static bridge structure. The type of structures to be constructed would be as recommended in the Technical Feasibility Report produced by AECOM with associated costings.

Strategic

Identified problems and objectives	A and C bridges will be effectively life expired by 2018 and replacement with new structures would mean that the A554 Tower Road could remain open to general traffic for cross-docks movement, access to the Stena Line Ferry Terminal and to facilitate the ongoing development of Wirral Waters. The replacement structures would necessitate a much less onerous and lower cost maintenance regime to be put in place, requiring fewer lane/road closures and for much shorter periods, reducing associated impacts on congestion, journey time reliability, noise and air pollution.	
Scale of impact	4	Expected to be a significant impact in terms of reducing the current maintenance liability associated with the two bridges, eliminating current safety concerns by constructing replacement bridges to current design standards and facilitating wider development in the local area and wider City Region, including Wirral Waters and SuperPort.
Fit with wider transport and government objectives	4	A good degree of fit with transport objectives, including the provision of a robust, efficient highway and freight network and supporting the effective movement of people and goods. Improved pedestrian and cyclist provision meets policy objectives relating to the promotion of sustainable travel.
Fit with other objectives	4	Strong fit with other objectives related to supporting economic development, specifically Wirral Waters, for which the A554 Tower Road is a key access route. The replacement of A bridge with a new lifting structure will have a positive impact on commercial port operations in terms of enabling vessels to access the dock when required without the possibility of being trapped.
Key uncertainties	It is not yet clear whether replacement of the bridges comprises Permitted Development or whether planning approval is required. There are uncertainties regarding the heritage value of the bridges and potential environmental constraints to construction that will only become apparent through a full environmental appraisal.	
Degree of consensus over outcomes	3	Stakeholders are in agreement that the replacement of both bridges would deliver significant benefits and provide the outcomes required. However, additional evidence is needed to justify replacement over ongoing maintenance of the existing bridges.

Economic

Economic growth	5. Green	A significant positive impact on economic growth is anticipated with this option - improvements to the resilience of the network will help to reduce journey times and journey time variability and support economic development. It is expected that there would be fewer accidents associated with bridge strikes due to the new bridges being designed to current standards in terms of height clearance.
Carbon emissions	4. Amber/green	There will be some negative impacts on carbon as a result of construction; however it is anticipated that this would be mitigated by reductions in vehicle km travelled due to fewer road closures and traffic diversions associated with maintenance activities.

Socio-distributional impacts and the regions	4. Amber/green	Positive impacts are anticipated in terms of economic growth and regeneration, particularly given the location of the bridges in relation to Wirral Waters. Cross-docks accessibility will improve as the route will remain open to general traffic over the long term with no weight restrictions required.
Local environment	4. Amber/green	Positive impacts on the local environment are anticipated due to reductions in traffic congestion and associated reductions in carbon emissions and noise. Some negative impacts from construction are anticipated; however these may be mitigated through the adoption of best practice construction techniques.
Well being	5. Green	It is expected that this option would deliver positive impacts on severance, access to services, physical activity and the number of accidents recorded.
Expected VfM category	3. Medium 1.5-2	Medium to high VfM anticipated as a result of the forecast benefits on journey times and journey time reliability and the wider regeneration and job creation benefits.

Managerial

Implementation timetable	5. 2-5 years	It is anticipated that a period of three years would be required to gain necessary consents, undertake detailed design, appoint a contractor and construct the two replacement bridges.
Public acceptability	3	Public acceptability is likely to be largely positive - there may be some negative impacts on the public during the construction period but if they are informed of the longer term benefits then they are likely to be largely supportive.
Practical feasibility	3	A new agreement would need to be put in place between Wirral Council and Peel Group regarding operation of A bridge as a lifting structure. There are also planning implications if the replacement of the bridges is not classified as Permitted Development.
What is the quality of the supporting evidence?	3	The structural evidence for replacement is robust as it is based on a comprehensive Technical Feasibility Report produced by AECOM that includes consideration of the most appropriate replacement structures. Additional traffic modelling and appraisal work is required to fully assess the costs and benefits associated with this option.
Key risks		These are predominantly planning related; for example planning permission may not be granted or the findings of the full environmental assessment could delay the project programme or compromise the project altogether. There is also a risk that Peel Group does not agree with the proposals for replacement and does not provide the financial contribution required.

Financial

Affordability	2	The replacement of the bridges represents a relatively high capital cost; however savings will be made in terms of the reduced maintenance regime required compared to the Do Minimum option.
Capital Cost (£m)	03. 5-10	The Technical Feasibility Report estimates the capital cost of bridge replacement to be £3.5m for A bridge and £2.45m for C bridge.
Revenue Costs (£m)	02. 0-5	Anticipated to be an additional £3.4m over the life of the replacement bridges.
Cost profile		Capital cost estimates are based on technical evidence and are considered to be robust.
Overall cost risk	4	
Other costs		Other costs relating to detailed design, the tender process and the planning process will be borne by Wirral Council.

Commercial

Flexibility of option	2	There is flexibility in the type of bridge replacement structure constructed and, although not considered necessary at this stage, the replacement bridges could in future accommodate a modified highway layout in light of development proposals.
Where is funding coming from?		This option forms part of the list of prioritised schemes as part of the Liverpool City Region Major Schemes Programme. As part-owner of A bridge and the developer of Wirral Waters, Peel Group is expected to make a significant financial contribution.
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - Expanded Print View

Option Name/No.	Do Something 2	
Date	27/08/2014	
Description	This option comprises the replacement of A bridge with a new lifting bridge structure and the replacement of C bridge with a causeway.	

Strategic

Identified problems and objectives	This option is broadly similar to 'Do Something 1' in terms of the identified problems and objectives. However, C bridge would be replaced with a causeway rather than a replacement bridge structure. A causeway would provide additional space to improve pedestrian and cyclist provision and could also accommodate future widening of the highway.	
Scale of impact	4	As per 'Do Something 1' with potentially greater improvements to pedestrian and cyclist provision.
Fit with wider transport and government objectives	4	As per 'Do Something 1'
Fit with other objectives	4	As per 'Do Something 1'
Key uncertainties	As per 'Do Something 1'	
Degree of consensus over outcomes	3	As per 'Do Something 1'

Economic

Economic growth	5. Green	As per 'Do Something 1'
Carbon emissions	4. Amber/green	As per 'Do Something 1'
Socio-distributional impacts and the regions	4. Amber/green	As per 'Do Something 1'
Local environment	4. Amber/green	As per 'Do Something 1'
Well being	5. Green	As per 'Do Something 1'
Expected VfM category	3. Medium 1.5-2	As per 'Do Something 1'. The costs for this option will differ depending on whether a partial or widened causeway is implemented.

Managerial

Implementation timetable	5. 2-5 years	As per 'Do Something 1'
Public acceptability	3	As per 'Do Something 1'
Practical feasibility	2	This option would require significant modification to the culvert system currently used to maintain the water level as well as drain the East Float.
What is the quality of the supporting evidence?	3	As per 'Do Something 1'
Key risks	As per 'Do Something 1' with some additional considerations including the modifications needed to the culvert system.	

Financial

Affordability	2	As per 'Do Something 1'
Capital Cost (£m)	03. 5-10	Estimated to be in the region of £6m
Revenue Costs (£m)	02. 0-5	It is assumed that the replacement of C bridge with a causeway would reduce the maintenance requirements.
Cost profile	As per 'Do Something 1'	
Overall cost risk	4	
Other costs	As per 'Do Something 1'	

Commercial

Flexibility of option	2	As per 'Do Something 1'
Where is funding coming from?	Funding may be available for this option depending on its performance in terms of other assessment criteria.	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - Expanded Print View

Option Name/No.	Do Something 3
Date	27/08/2014
Description	This option comprises the replacement of A bridge with a new static bridge structure and the replacement of C bridge with a new causeway.

Strategic

Identified problems and objectives	This option is broadly similar to 'Do Something 1' in terms of the identified problems and objectives. However, A bridge would be replaced with a static bridge structure that would keep the route open to general traffic and permit only small vessels to enter the dock. This would be a dis-benefit to local commercial operations but would reduce the maintenance requirements associated with a lifting structure and also eliminate the amount of time that traffic needs to wait for the bridge to lift to enable vessels to enter the dock.	
Scale of impact	4	As per 'Do Something 1'
Fit with wider transport and government objectives	4	As per 'Do Something 1' with the potential addition of some improvements to provision for pedestrians and cyclists associated with the creation of a causeway as a replacement for C bridge.
Fit with other objectives	3	Supports some regeneration and development by keeping the route open to general traffic and reducing the level of closures required to facilitate maintenance. However, the replacement of A bridge with a static structure will have a significant detrimental impact on commercial activities associated with the port and future activities associated with Wirral Waters.
Key uncertainties	As per 'Do Something 1'	
Degree of consensus over outcomes	3	As per 'Do Something 1'

Economic

Economic growth	3. Amber	The replacement of A bridge with a static structure will have a significant negative impact on commercial operations in the local area and wider City Region in terms of port traffic. In addition the contribution made to Wirral Waters and SuperPort will be much lower than would be the case for a lifting bridge option. However, there will be some economic benefits associated with reductions in journey times and congestion associated with a reduced maintenance regime.
Carbon emissions	4. Amber/green	As per 'Do Something 1'
Socio-distributional impacts and the regions	4. Amber/green	As per 'Do Something 1'
Local environment	4. Amber/green	As per 'Do Something 1'
Well being	5. Green	As per 'Do Something 1'
Expected VfM category	4. Low 1-1.5	Likely to be low as a result of negative impacts on commercial port operations and wider regeneration.

Managerial

Implementation timetable	5. 2-5 years	As per 'Do Something 1'
Public acceptability	3	As per 'Do Something 1'
Practical feasibility	1. Low	Considered to be low due to the severe restrictions placed on commercial port operations through the replacement of A bridge with a static structure. The replacement of C bridge with a causeway will also require substantial modifications to the culvert system used to maintain the water level and drain the East Float.

What is the quality of the supporting evidence?	3	As per 'Do Something 1'
Key risks	As part-owner and operator of A bridge, Peel Group is highly unlikely to agree to this option being taken forward or to make the required financial contribution due to the severe restrictions placed on commercial port operations and on the future development of Wirral Waters.	

Financial		
Affordability	2	As per 'Do Something 1'
Capital Cost (£m)	03. 5-10	Estimated to be in the region of £6m
Revenue Costs (£m)	02. 0-5	As per 'Do Something 1'
Cost profile	As per 'Do Something 1'	
Overall cost risk	4	
Other costs	As per 'Do Something 1'	

Commercial		
Flexibility of option	2	As per 'Do Something 1'
Where is funding coming from?	Funding may be available depending on the options performance against other assessment criteria.	
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - Expanded Print View

Option Name/No.	Do Something 4
Date	28/08/2014
Description	This option comprises planned maintenance of A bridge over its 40 year residual life and the replacement of C bridge with a causeway.

Strategic

Identified problems and objectives	<p>A programme of planned maintenance for A bridge will enable it to remain open to all traffic for as long as possible to facilitate cross-docks travel, access for commercial port traffic to local facilities and support the development of Wirral Waters. The replacement of C bridge with a causeway would enable future improvements in pedestrian and cyclist provision and potential widening of the carriageway. It should be noted that, even with a programme of planned maintenance, weight restrictions will in future be required for A bridge, followed by eventual closure. This would restrict larger vessels from entering the dock and also mean that traffic would need to approach the A554 Tower Road from the south to access the Stena Line Ferry Terminal through the use of C bridge - the route would not remain open as a through route to cross-docks traffic.</p>	
Scale of impact	2	Overall, this option is considered to have only a minor impact on the problems identified as the replacement of only one bridge means that, over the short to medium term, weight restrictions will need to be applied to A bridge, which will effectively limit the ability of the A554 Tower Road to cater to cross-docks movements. Over the longer term, the closure of A bridge would limit the route as an access to the Stena Line Ferry Terminal from the south, with no through traffic. Larger vessels would not be able to enter the dock and the future successful development of Wirral Waters would be compromised.
Fit with wider transport and government objectives	2	To an extent, this option would support network resilience in the short to medium term and enable the route to remain open to cross-docks traffic and also support commercial shipping operations by continuing to provide access to the dock for larger vessels. The replacement of C bridge with a causeway wider than the existing bridge would enable improvements to be made to pedestrian and cyclist provision, although it should be noted that this would need to be complemented by improvements along the length of the route.
Fit with other objectives	2	This option will support regeneration and development over the short to medium term; however once weight restrictions are applied to A bridge and the maintenance regime is ramped up the scheme will provide poor fit with policy objectives in terms of network resilience, journey times, congestion and air quality.
Key uncertainties	<p>Although deterioration modelling has been carried out for A bridge, there are uncertainties regarding when exactly when weight restrictions will be required. In terms of the replacement of C bridge with a causeway, it is not yet clear whether this comprises Permitted Development or whether planning approval is required. There are uncertainties regarding the heritage value of the existing bridge and potential environmental constraints to construction that will only become apparent through a full environmental appraisal.</p>	
Degree of consensus over outcomes	3	Further appraisal is needed in order for stakeholders to come to an agreement in terms of whether maintenance and/or replacement will deliver the best outcomes.

Economic

Economic growth	2. Red/amber	The future application of weight restrictions and eventual closure of A bridge will limit the extent to which economic development can take place in the local area, as the A554 Tower Road is a key cross-docks route for freight and non-freight traffic. The resilience of the network will worsen over time and the existing features on A bridge that do not conform to current safety standards present a safety concern.
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Carbon emissions	2. Red/amber	Overall, vehicle kilometres will increase due to the significant maintenance requirements associated with A bridge. In combination with the carbon impacts of the construction of the causeway, there is likely to be a negative impact on carbon emissions.
Socio-distributional impacts and the regions	2. Red/amber	Anticipated negative impacts on accessibility across the docks and on regeneration.
Local environment	3. Amber	Impacts on the local environment are difficult to establish at this stage; there will be short term negative impacts as a result of construction and also on noise and air quality as a result of vehicle diversions for maintenance activities and when weight restrictions are applied.
Well being	2. Red/amber	Negative impacts on severance and journey times over the longer term once weight restrictions are applied on A bridge, followed by eventual closure.
Expected VfM category	5. Poor <1	The replacement of only one bridge will not deliver significant benefits over the medium to long term as the two bridges form part of the same route; thus both need to remain open without weight restrictions to facilitate cross-docks travel. In the future, A bridge will likely need to close, with a resultant significant detrimental impact on commercial port operations.

Managerial

Implementation timetable	5. 2-5 years	It is considered likely that a period of 2-5 years would be needed to gain the necessary consents, undergo detailed design, appoint a contractor and replace C bridge and also put in place a comprehensive maintenance regime for A bridge.
Public acceptability	2	The public may find it difficult to understand the benefits of replacing only one bridge when both form part of the same route and when A bridge is required to remain in operation not only for vehicle traffic but also for port traffic.
Practical feasibility	2	It is not considered that this option is the most practical as the continued operation of A bridge is essential for port operations. It would seem more practical to either maintain both bridges or replace both bridges given they form part of the same cross-docks route. In addition significant modifications would be required to the culvert at C bridge.
What is the quality of the supporting evidence?	2	There is sufficient technical structural information on the forecast deterioration of the bridges contained in the Technical Feasibility Report. However, there is little supporting evidence that only replacing one bridge and maintaining the other will deliver the required outcomes.
Key risks	These include planning risks in terms of gaining the necessary approvals for C bridge, the risk that a catastrophic bridge strike will occur on A bridge that requires it to close earlier than forecast and the risk that Peel Group does not accept this option and does not make the financial contribution required.	

Financial

Affordability	2	
Capital Cost (£m)	03. 5-10	Approximately £7.1m would be required to maintain A bridge and replace C bridge with a causeway.
Revenue Costs (£m)	02. 0-5	Unknown at this stage; however they are considered to be similar to the other 'Do Something' options.
Cost profile	As per 'Do Something 1'	
Overall cost risk	2	
Other costs	As per 'Do Something 1'	

Commercial

Flexibility of option	3	In the future the maintenance regime for A bridge could be stopped and it could be replaced; however this would raise the issue of Value for Money in terms of the maintenance carried out to date and also the affordability of providing a new bridge.
Where is funding coming from?		Funding may be available depending on the performance of the option against other assessment criteria.
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - Expanded Print View

Option Name/No.	Do Something 5	
Date	28/08/2014	
Description	This option comprises planned maintenance of A bridge over its 40 year residual life and the replacement of C bridge with a static bridge structure.	

Strategic

Identified problems and objectives	As per 'Do Something 4'	
Scale of impact	2	As per 'Do Something 4'
Fit with wider transport and government objectives	2	As per 'Do Something 4'; however the replacement of C bridge with a static bridge structure may limit the future potential to improve pedestrian and cyclist provision. As noted, any such improvements would need to be tied in with wider improvements along the length of the route.
Fit with other objectives	2	As per 'Do Something 4'
Key uncertainties	As per 'Do Something 4'	
Degree of consensus over outcomes	3	As per 'Do Something 4'

Economic

Economic growth	2. Red/amber	As per 'Do Something 4'
Carbon emissions	2. Red/amber	As per 'Do Something 4'
Socio-distributional impacts and the regions	2. Red/amber	As per 'Do Something 4'
Local environment	3. Amber	As per 'Do Something 4'
Well being	2. Red/amber	As per 'Do Something 4'
Expected VfM category	5. Poor <1	As per 'Do Something 4'

Managerial

Implementation timetable	5. 2-5 years	As per 'Do Something 4'
Public acceptability	2	As per 'Do Something 4'
Practical feasibility	3	This option is considered to carry a greater degree of practical feasibility as the replacement of C bridge with a static bridge structure is more straightforward than replacement with a causeway and no modifications to the culvert are required.
What is the quality of the supporting evidence?	2	As per 'Do Something 4'
Key risks	As per 'Do Something 4'	

Financial

Affordability	2	As per 'Do Something 4'
Capital Cost (£m)	03. 5-10	In the Technical Feasibility Report it is estimated that the capital cost of this option would be approximately £7.2m.
Revenue Costs (£m)	02. 0-5	As per 'Do Something 4'
Cost profile	As per 'Do Something 1'	
Overall cost risk	2	
Other costs	As per 'Do Something 1'	

Commercial

Flexibility of option	3	As per 'Do Something 1'
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Where is funding coming from?	Funding may be available depending on the option's performance against other assessment criteria.
Any income generated? (£m)	No

Early Assessment and Sifting Tool (EAST) - Expanded Print View

Option Name/No.	Do Something 6
Date	28/08/2014
Description	This option comprises replacement of A bridge with a lifting bridge structure and planned maintenance of C bridge over its 40 year residual life.

Strategic

Identified problems and objectives	A and C bridges will be life expired in 2018 and the main objective is to keep both bridges in operation to support cross-docks movements for freight and non-freight vehicle traffic and to continue to enable larger vessels to access the dock in support of commercial port operations. Replacement of A bridge with a lifting bridge structure will support port operations and the wider development of Wirral Waters. Maintenance of C bridge will prolong the length of time that it can remain open without weight restrictions. However, over the medium to long term, it is likely that C bridge would need to close permanently.	
Scale of impact	3	This option will help to ensure that the A554 Tower Road remains open as a key cross-docks route for freight and non-freight traffic over the short to medium term. The replacement of A bridge with a lifting bridge structure will have a significant impact in terms of keeping the dock open for commercial operations and supporting the future success of Wirral Waters.
Fit with wider transport and government objectives	3	There is a reasonable degree of fit with transport objectives in terms of enabling commercial port operations to continue and reducing the length of time and frequency of lane/road closures associated with the maintenance of both bridges, which will reduce the period of traffic diversions required and reduce the impacts on journey times, air quality and noise.
Fit with other objectives	3	This option performs better than other options that do not include a lifting bridge structure for A bridge as it will support ongoing commercial port operations and longer term economic growth through the development of Wirral Waters and SuperPort.
Key uncertainties	Although deterioration modelling has been carried out for C bridge, there are uncertainties regarding when exactly when weight restrictions will be required. In terms of the replacement of A bridge, it is not yet clear whether this comprises Permitted Development or whether planning approval is required. There are uncertainties regarding the heritage value of the existing bridge and potential environmental constraints to construction that will only become apparent through a full environmental appraisal.	
Degree of consensus over outcomes	3	As per 'Do Something 4'

Economic

Economic growth	4. Amber/green	The replacement of A bridge with a lifting bridge structure will enable commercial port operations to continue over the long term and support the future development of Wirral Waters, thus supporting economic growth both in the local area and wider City Region. The eventual application of weight restrictions on C bridge and its future closure will however have a detrimental impact on economic growth.
Carbon emissions	3. Amber	There will be a positive impact on carbon emissions over the short to medium term as a result of the decreased maintenance activities associated with A bridge and resultant traffic diversions, which mean longer journey times, more congestion and poorer air quality. However there will still be a significant maintenance requirement in relation to C bridge.
Socio-distributional impacts and the regions	3. Amber	Positive impacts on accessibility and regeneration in the short to medium term; however there may be future negative impacts as a result of the future application of weight restrictions and eventual closure of C bridge.
Local environment	3. Amber	Impacts are likely to be positive in the short to medium term, but will become less significant as C bridge deteriorates and weight restrictions are applied.

Well being	3. Amber	Again, these will be more positive in the short to medium term but there may be negative impacts associated with the future deterioration of C bridge.
Expected VfM category	4. Low 1-1.5	This option is expected to yield better Value for Money compared to options that do not include a lifting bridge structure for A bridge, but poorer Value for Money compared to the replacement of both bridges due to the traffic diversions associated with bridge maintenance and future application of weight restrictions.

Managerial

Implementation timetable	5. 2-5 years	A period of 2-5 years is considered necessary to gain the necessary consents, undergo detailed design and construct a replacement A bridge and to implement the maintenance programme for C bridge.
Public acceptability	2	As per 'Do Something 4'
Practical feasibility	3	The practical feasibility of this option is considered to be better than the replacement of both bridges simultaneously in terms of construction and the construction of a static bridge for C bridge rather than a causeway removes the need to modify the culvert.
What is the quality of the supporting evidence?	3	There is evidence in the Technical Feasibility Report that the replacement of A bridge with a lifting bridge structure is a robust and appropriate option. There is also sufficient evidence on the forecast maintenance requirements for C bridge. However, these may change over time.
Key risks		These are planning related e.g. whether planning approval can be gained (if required) for the replacement of A bridge and also stakeholder related in terms of Peel Group agreeing with this as the most appropriate option and making the financial contribution required. Also a catastrophic event in relation to C bridge could mean that replacement is required during its residual life.

Financial

Affordability	2	
Capital Cost (£m)	03. 5-10	The Technical Feasibility Report estimates that the capital cost of this option would be circa £7.4m
Revenue Costs (£m)	02. 0-5	Unknown in any detail at this stage
Cost profile		As per 'Do Something 1'
Overall cost risk	2	
Other costs		As per 'Do Something 1'

Commercial

Flexibility of option	3	It is possible in future that C bridge could be replaced instead of further maintenance; however no funding has been identified for this option. There is some flexibility in the type of lifting bridge structure used for A bridge.
Where is funding coming from?		Funding may be available depending on the option's performance against other assessment criteria.
Any income generated? (£m)	No	

Early Assessment and Sifting Tool (EAST) - Expanded Print View

Option Name/No.	Do Something 7
Date	28/08/2014
Description	This option comprises replacement of A bridge with a static bridge structure and maintenance of C bridge over its 40 year residual life.

Strategic

Identified problems and objectives	A and C bridges will be life expired in 2018 and the main objective is to keep both bridges in operation to support cross-docks movements for freight and non-freight vehicle traffic and to continue to enable larger vessels to access the dock in support of commercial port operations. Replacement of A bridge will reduce the maintenance liability and associated road closures and traffic diversions and maintenance of C bridge will prolong the length of time that it can remain open without weight restrictions. However, over the medium to long term, it is likely that C bridge would need to close permanently. In addition, the replacement of A bridge with a static structure would mean that larger vessels associated with commercial port operations are unable to access the dock.	
Scale of impact	2	It is considered that the scale of impact of this option would be lower than 'Do Something 6' as the replacement of A bridge with a static structure will limit port operations and limit the ability of the local area to grow and develop. However, there would be localised positive impacts relating to the decreased maintenance requirements for A bridge and the associated traffic diversions.
Fit with wider transport and government objectives	2	There is some degree of fit with transport objectives in terms of network resilience and reducing journey time unreliability and congestion associated with road closures and traffic diversions and associated impacts on air quality and noise. However, there is a poor fit in terms of supporting port operations and potential future growth.
Fit with other objectives	2	This option does not make a significant contribution towards other objectives in terms of economic growth driven by regeneration and development, particularly in terms of Wirral Waters due to the eventual closure of C bridge and also the future inability of larger vessels to access the dock.
Key uncertainties	As per 'Do Something 6'	
Degree of consensus over outcomes	3	As per 'Do Something 4'

Economic

Economic growth	2. Red/amber	The replacement of A bridge with a static structure will have a significant negative impact on port operations and the potential future development of East Float. The future application of weight restrictions on C bridge will also limit the ability of the area to grow and develop and contribute to wider City Region projects such as SuperPort.
Carbon emissions	3. Amber	The decreased maintenance liability for C bridge will reduce the carbon emissions related to road closures; however over the longer term weight restrictions and eventual closure will be required, which will increase journey times and congestion and have a negative impact on carbon emissions.
Socio-distributional impacts and the regions	3. Amber	A negative impact is anticipated as the replacement of A bridge with a static structure will not support development and regeneration of the East Float.
Local environment	3. Amber	Noise and air quality may improve initially; however once weight restrictions are applied to C bridge there will be negative impacts on noise and air quality.

Well being	3. Amber	Over the longer term there will be negative impacts on severance and access to services for local people due to the eventual closure of the A554 Tower Road as a through route for cross-docks travel.
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Expected VfM category	5. Poor <1	Value for Money is expected to be poor given the economic dis-benefits of not maintaining access to the East Float and the future weight restrictions required for C bridge, followed by its eventual closure.
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Managerial

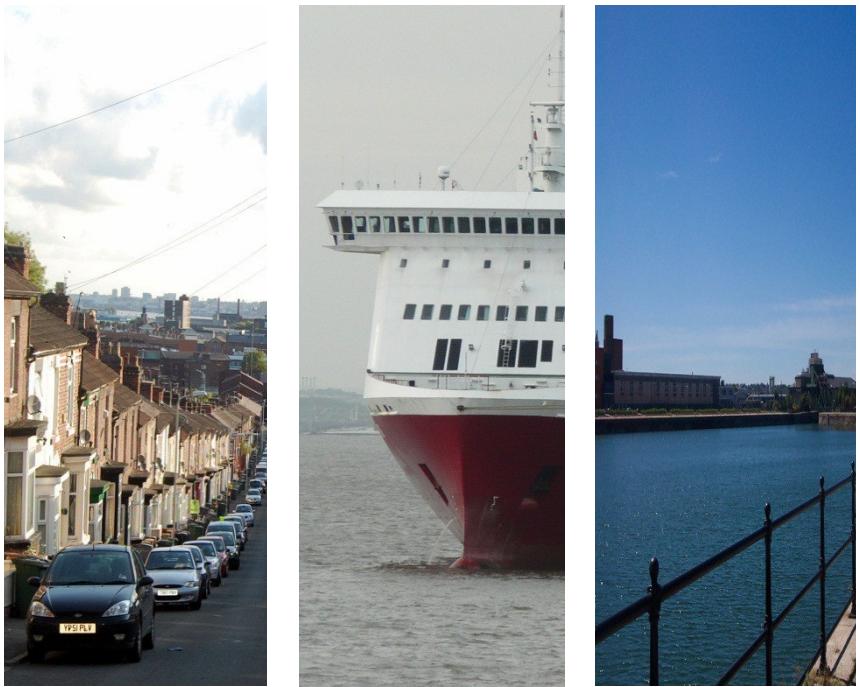
Implementation timetable	5. 2-5 years	As per 'Do Something 6'
Public acceptability	3	As per 'Do Something 6'
Practical feasibility	3	The practical feasibility of this option is considered to be better than the replacement of both bridges simultaneously. However it is not considered practicable to have a static A bridge given the requirements Peel Group has in terms of access to the East Float.
What is the quality of the supporting evidence?	3	There is evidence in the Technical Feasibility Report that the replacement of A bridge is a robust and appropriate option. There is also sufficient evidence on the forecast maintenance requirements for C bridge. However, these may change over time.

Key risks	As per 'Do Something 6'	
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Financial		
Affordability	2	
Capital Cost (£m)	03. 5-10	Estimated to be in the region of £7.4m for the replacement of A bridge and maintenance of C bridge.
Revenue Costs (£m)	02. 0-5	Unknown in any detail at this stage
Cost profile	As per 'Do Something 1'	
Overall cost risk	2	
Other costs	As per 'Do Something 1'	

Commercial		
Flexibility of option	2	
Where is funding coming from?	Funding may be available depending on the option's performance against other assessment criteria.	
Any income generated? (£m)	No	

Appendix B. Economic Assessment Report



Wirral Docks Bridges Major Scheme Business Case

Economic Assessment

October 2014

Wirral Council

Wirral Docks Bridges Major Scheme Business Case

Economic Assessment

October 2014

Wirral Council

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	17/09/2014	S Pierce	N Green	N Green	First draft for issue
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1. Economic Assessment

1.1 Introduction

This Technical Note summarises the economic assessment carried out to assess and sift options for the replacement or maintenance of the Wirral Docks Bridges.

Figure 1.1 shows the location of the bridges referred to in this document as A Bridge, C Bridge and Duke Street Bridge.

The economic assessments are not final and are based on a number of assumptions and approximations that are discussed in this document.

Two assessments have been undertaken:

- Assessment 1 : The existing bridges can be maintained for the first 40 years of assessment but are no longer operational during the last 20 years of assessment;
- Assessment 2 : The existing bridges can be maintained for the full 60 years of the assessment.

The first version of this report presented the results of Assessment 1; however following discussions with Wirral Council and Peel at the Project Board meeting held on 30th September 2014 it was decided to proceed with Assessment 2. Appendix A presents the results of Assessment 1 and the main body of this document presents the results of Assessment 2.

The options that have been assessed as part of Assessment 2 are:

- **Do Minimum** - carry out the planned maintenance programme on both A and C Bridges as detailed in the Technical Feasibility Report produced by AECOM for 60 years;
- **Do Something 1** – replace both A and C Bridges;
- **Do Something 5** – maintain A Bridge and replace C Bridge; and
- **Do Something 6** – replace A Bridge and maintain C Bridge.

This transport economic assessment has been carried out with reference to the Department for Transport's Transport Appraisal Guidance (Web TAG). The assessment also accounts for a number of simplifying assumptions based on local evidence to produce a robust assessment of the three options being considered. This assessment is based on model outputs from the East Wirral Traffic Model (EWTM).

The transport economic assessment has been undertaken using the TUBA (Transport Users Benefit Assessment) programme which carries out economic assessment in accordance with published DfT guidance (WebTAG Unit A1.3). This is based on trip and cost matrices from the EWDM and travel cost changes implied by the proposed schemes.

Figure 1.1: Location Of Bridges



1.2 Summary of Economic Assessment Results

The assessment has been carried out for each of the three Do Something options. The assessment itself is carried out in line with Department for Transport Guidance with a number of relevant simplifying assumptions adopted in order to maximise use of available modelling evidence. These are discussed further below.

Table 1.1 summarises the outcomes of the assessment of the three schemes.

Table 1.1: Appraisal summary (over 60 years)

	DS1	DS5	DS6
Do-Minimum Costs (£000s) in 2014 prices	£7,845	£7,845	£7,845
Scheme Costs (£000s) in 2014 prices*	£8,020	£8,570	£7,295
Net Costs (£000s) discounted to 2010	£2,836	£1,521	£1,303
Net Benefits (£000s) discounted to 2010	£16,770	£6,611	£10,141
Benefit to Cost Ratio (BCR)	5.91	4.35	7.78

* All costs include optimism bias of 30% as presented in the AECOM Technical Feasibility Report

* The costs in the do-minimum scenario do not include M&E maintenance as robust information was not available

Note – all figures in Table 1.1 are subject to change as refinements to the modelling approach are undertaken

1.2.1 Economic Benefits for Replacing A Bridge and Replacing C Bridge

Table 1.1 shows that DS1 is forecast to deliver a present value of transport economic benefits (PVB) of **£16.8m** where the scheme is assumed to produce benefits over the standard assessment period of 60 years for infrastructure schemes of this size.

When the PVB is taken together with the present value of scheme costs (PVC) of **£2.8m** the BCR is calculated as **5.9**.

According to Department for Transport Guidance, the BCR of 5.9 represents **very high Value for Money** for the option to replace A and C bridges.

1.2.2 Economic Benefits for Maintaining A Bridge and Replacing C Bridge

Table 1.1 shows that DS5 is forecast to deliver a present value of transport economic benefits (PVB) of **£6.6m** where the scheme is assumed to produce benefits over the standard assessment period of 60 years for infrastructure schemes of this size.

When the PVB is taken together with the present value of scheme costs (PVC) of **£1.5m** the BCR is calculated as **4.4**.

According to Department for Transport Guidance, the BCR of 4.4 represents **very high Value for Money** for the maintaining A Bridge and replacing C Bridge option.

1.2.3 Economic Benefits for Replacing A Bridge and Maintaining C Bridge

Table 1.1 shows DS6 is forecast to deliver a present value of transport economic benefits (PVB) of **£10.1m** where the scheme is assumed to produce benefits over the standard assessment period of 60 years for infrastructure schemes of this size.

When the PVB is taken together with the present value of scheme costs (PVC) of **£1.3m** the BCR is calculated as **7.8**.

According to Department for Transport Guidance, the BCR of 7.8 represents **very high Value for Money** for the replacing A Bridge and Maintaining C Bridge option.

1.3 Modelling and Assessment Assumptions

In order to arrive at the economic benefits summarised in Table 1.1 above a number of modelling and assessment assumptions have been adopted. The standard WebTAG assessment forms the basis of the approach with specific assumptions and simplifications made to allow best use of available local modelling data and perceived nature of the schemes and longevity of their impacts.

1.3.1 Assessment Period

Full 60 year assessments have been undertaken for each option.

1.3.2 Modelled Years

Economic benefits have been calculated based on traffic flow data from a single forecast year of 2030. Traffic flow levels have assumed to be constant at 2020 and 2030 to provide two forecast years required to undertake the assessment within TUBA.

These results are then interpolated and extrapolated accordingly to obtain economic benefits for all other years, which are then discounted to 2010 for reporting and calculation of BCRs.

1.3.3 Annualisation

Annualisation factors convert benefits calculated for each day into totals for the full year. To achieve this, annualisation factors developed for the Liverpool City Region Transport Model have been adopted. These factors have been used and accepted by the DfT on funding application projects such as LSTF, Local Pinch Point applications, and Better Bus Fund. The annualisation factors are robust and suitable for the current assessments.

Table 1.2: Annualisation Factors

Time Period	Factor
AM	637
IP	1518
PM	675

1.3.4 Model Outputs

Model outputs have been derived from a series of scenarios set up within the EWFM to account for different possible configurations of bridge closures. Further details of the methodology can be found in **Appendix C**.

1.3.5 Scheme Costs

The latest estimates of maintenance and construction costs and expenditure profiles that have been applied in this assessment are presented in **Appendix C**.

1.4 Conclusions

Economic benefits for three options for the maintenance and replacement of Wirral Docks Bridges have been calculated based on currently available information and in line with WebTAG guidance and compared against a Do Minimum option. The economic assessment work and the associated transport modelling have been undertaken to inform the Options Assessment and the outcomes from this assessment are subject to refinement during subsequent stages of the assessment.

It is noted that all three scheme options show very high Value for Money based on DfT criteria.

The current analysis provides an indication of likely economic benefits and BCRs, and shows that Option 6 (Replace A Bridge Only) would provide the highest benefits with a calculated BCR of 7.8; Option 1 (Replace A Bridge and C Bridge) as being the next best with a BCR of 5.9; followed by Option 5 (Replace C Bridge Only) with a BCR of 4.4.

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Appendix A. Assessment 1 – Results

A.1 Introduction

This Appendix summarises the economic assessment carried out to assess and sift options for the replacement or maintenance of the Wirral Docks Bridges.

Figure A.1 shows the location of the bridges referred to in this document as A Bridge, C Bridge and Duke Street Bridge.

The economic assessments are not final and are based on a number of assumptions and approximations that are discussed in this document.

The assessment has been carried out over 60 years, during which two different scenarios are considered:

- The existing bridges are maintained – first 40 years of assessment; and
- The existing bridges have come to the end of their design life and are no longer operational – the last 20 years of assessment.

The options that have been assessed are:

- **Do Minimum** - carry out the planned maintenance programme on both A and C Bridges as detailed in the AECOM Technical Feasibility Report for 40 years and A and C Bridges are closed for the last 20 years;
- **Do Something 1** – replace both A and C Bridges;
- **Do Something 5** – maintain A Bridge and replace C Bridge for 40 years and A Bridge is closed for the last 20 years; and
- **Do Something 6** – replace A Bridge and maintain C Bridge for 40 years and C Bridge is closed for the last 20 years.

This transport economic assessment has been carried out with reference to the Department for Transport's Transport Appraisal Guidance (WebTAG). This assessment also accounts for a number of simplifying assumptions based on local evidence to produce a robust assessment for the three options for consideration. This assessment is based on model outputs from the East Wirral Traffic Model (EWTM).

The transport economic assessment has been undertaken using the TUBA (Transport Users Benefit Assessment) program which carries out economic assessment in accordance with published DfT guidance (WebTAG Unit A1.3). This is based on trip and cost matrices from the EWTM and travel cost changes implied by the proposed schemes.

Figure A.1: Location of Bridges



A.2 Summary of Economic Assessment Results

The assessment has been carried out for each of the options. The assessment itself is carried out in line with Department for Transport Guidance with a number of relevant simplifying assumptions adopted in order to maximise use of available modelling evidence. These are discussed further below.

Table A.1 summarises the outcomes of the assessment of the three schemes.

Table A.1: Appraisal summary (over 60 years)

	DS1	DS5	DS6
Do-Minimum Costs (£000s) in 2014 prices	£5,662	£5,662	£5,662
Scheme Costs (£000s) in 2014 prices*	£8,668	£7,202	£7,128
Net Costs (£000s) discounted to 2010	£3,038	£1,720	£1,581
Net Benefits (£000s) discounted to 2010	£31,884	£5,072	£7,802
Benefit to Cost Ratio (BCR)	10.50	2.95	4.93

* All costs include optimism bias of 30% as presented in the Technical Feasibility Report

Note – all figures in Table A.1 are subject to change as refinements to the modelling approach are undertaken

A.2.1 Economic Benefits for Replacing A Bridge and Replacing C Bridge

Table 1.1 shows that DS1 is forecast to deliver a present value of transport economic benefits (PVB) of **£31.9m** where the scheme is assumed to produce benefits over the standard assessment period of 60 years for infrastructure schemes of this size.

When the PVB is taken together with the present value of scheme costs (PVC) of **£3.0m** the BCR is calculated as **10.5**.

According to Department for Transport Guidance, the BCR of 10.5 represents **very high Value for Money** for the option to replace both A bridge and C bridge.

A.2.2 Economic Benefits for Maintaining A Bridge and Replacing C Bridge

Table A.1 shows that DS5 is forecast to deliver a present value of transport economic benefits (PVB) of **£5.1m** where the scheme is assumed to produce benefits over the standard assessment period of 60 years for infrastructure schemes of this size.

When the PVB is taken together with the present value of scheme costs (PVC) of **£1.7m** the BCR is calculated as **2.9**.

According to Department for Transport Guidance, the BCR of 2.9 represents **high Value for Money** for the maintaining A Bridge and replacing C Bridge option.

A.2.3 Economic Benefits for Replacing A Bridge and Maintaining C Bridge

Table A.1 shows DS6 is forecast to deliver a present value of transport economic benefits (PVB) of **£7.8m** where the scheme is assumed to produce benefits over the standard assessment period of 60 years for infrastructure schemes of this size.

When the PVB is taken together with the present value of scheme costs (PVC) of **£1.6m** the BCR is calculated as **4.9**.

According to Department for Transport Guidance, the BCR of 4.9 represents **very high Value for Money** for the replacing A Bridge and Maintaining C Bridge option.

A.3 Modelling and Assessment Assumptions

In order to arrive at the economic benefits summarised in Table A.1 above a number of modelling and assessment assumptions have been adopted. The standard WebTAG assessment forms the basis of the approach with specific assumptions and simplifications made to allow best use of available local modelling data and perceived nature of the schemes and longevity of their impacts.

A.3.1 Assessment Period

Full 60 year assessments have been undertaken for each option.

A.3.2 Modelled Years

Economic benefits have been calculated based on traffic flow data from a single forecast year of 2030. Traffic flow levels have assumed to be constant at 2020 and 2030 to provide two forecast years required to undertake the assessment within TUBA.

These results are then interpolated and extrapolated accordingly to obtain economic benefits for all other years, which are then discounted to 2010 for reporting and calculation of BCRs.

A.3.3 Annualisation

Annualisation factors convert benefits calculated for each day into totals for the full year. To achieve this, annualisation factors developed for the Liverpool City Region Transport Model have been adopted. These factors have been used and accepted by the DfT on funding application projects such as LSTF, Local Pinch Point applications, and Better Bus Fund. The annualisation factors are robust and suitable for the current assessments.

A.3.4 Model Outputs

Model outputs have been derived from a series of scenarios set up within the EWFM to account for different configurations of bridge closures. Further details of the methodology can be found in **Appendix B**.

A.3.5 Scheme Costs

The most recent estimates of maintenance and construction costs and the profiling of this expenditure have been used in this assessment. Further details can be found in **Appendix B**.

A.4 Conclusions

Economic benefits for three options for the maintenance and replacement of Wirral Docks Bridges have been calculated based on currently available information and in line with WebTAG guidance and compared against a Do Minimum option. The economic assessment work and the associated transport modelling have been undertaken to inform the Options Assessment and the outcomes from this assessment are subject to refinement during subsequent stages of the assessment.

It is noted that all schemes show high or very high Value for Money based on DfT criteria.

The current analysis provides an indication of likely economic benefits and BCRs for the options identifying Option 1 (Replace A and C Bridge) as providing the highest benefits, with a calculated BCR of 10.5, Option 6 (Replace A Bridge Only) as being the next best with a BCR of 4.93 and Option 5 (Replace C Bridge Only) as the being the last of the three options considered.

Appendix B. Assessment 1 - Methodology

B.1 Introduction

This Appendix sets out the methodology and assumptions for the Stage 1 traffic forecasting and economic assessment work for Assessment 1.

The objective of the Stage 1 assessment work is to identify the preferred scheme option from the following options:

- **Do Minimum** - carry out the planned maintenance programme on both A and C Bridges as detailed in the AECOM Technical Feasibility Report;
- **Do Something 1** – replace both A and C Bridges;
- **Do Something 5** – maintain A Bridge and replace C Bridge; and
- **Do Something 6** – replace A Bridge and maintain C Bridge.

B.2 OAR Stage 1 Assessment 1 - Background

The likely benefits from the proposed scheme will be accrued from the reduction in travel distance and time associated with the reduction of queues and delays connected with the maintenance programme of the existing bridges.

From reference to the 'Technical Feasibility Report' (*Wirral Docks Technical Feasibility Report REV P02*), it is estimated that there will be up to 166 weeks of closures for each bridge structure over a 40 year period to carry out the planned maintenance programme. This is equivalent to around 3 to 4 weeks of route diversions for each structure per annum.

B.3 OAR Stage 1 Assessment 1 – Methodology – First 40 Years

The East Wirral Traffic Model (EWTM) has been used to model a series of future year 'maintenance scenarios' using a reference case forecast (constrained to TEMPRO) for the future year of 2030. The following model scenarios have been defined:

- Scenario 1 - no bridge closures;
- Scenario 2 - A Bridge Maintenance - closure of A Bridge only;
- Scenario 3 - C Bridge Maintenance - closure of C Bridge only; and
- Scenario 4 - Duke Street Bridge Maintenance - closure of Duke Street Bridge.

The bridge closures have been represented in EWTM by the inclusion of a link restriction (banned turn).

The maintenance scenarios have been modelled for the AM (08:00-09:00) peak hour, an average inter-peak hour (between 10:00 and 16:00) and PM (17:00-18:00) peak hour time periods for the identified forecast year. Time and distance cost skims have been extracted from each of the model scenarios and weighted accordingly for input into the economic assessment (TUBA).

Presented below is a description of how each of the maintenance/replacement scenarios has been treated for each option, to generate inputs for the economic assessment. The applied weightings have been calculated based on future year maintenance estimates presented in Section 4 of the 'Technical Feasibility Report' (Tables 4.3 and 4.5). It is assumed that maintenance of the existing bridges is carried out in isolation for each bridge structure.

Do Minimum Option – Maintain All Bridge Structures

For the Do Minimum Option, the following weightings have been applied to cost skims:

- Scenario 1 - no bridge closures - 42 weeks of the year;
- Scenario 2 - A Bridge closure only - 4 weeks of the year;
- Scenario 3 - C Bridge closure only - 3 weeks of the year;
- Scenario 4 – Duke Street Bridge closure only - 3 weeks of the year.

The Do Minimum option assumes that both 'A' and 'C' Bridges will remain operational for the full 60 years of the assessment period.

Do Something Option 1 - Replace A Bridge and Replace C Bridge

For Do Something Option 1, the following weightings have been applied to cost skims:

- Scenario 1 - no bridge closures - 48 weeks of the year;
- Scenario 2 – New A Bridge closure only – 0.5 weeks of the year plus 15 weeks due to closures during construction;
- Scenario 3 – New C bridge closure only – 0.1 weeks of the year plus 9 weeks due to closures during construction;
- Scenario 4 - Duke Street Bridge closure only - 3 weeks of the year.

Do Something Option 5 - maintain A Bridge and replace C Bridge

For Do Something Option 5, the following weightings have been applied to cost skims:

- Scenario 1 - no bridge closures - 44 weeks of the year;
- Scenario 2 - A Bridge closure only - 4 weeks of the year;
- Scenario 3 – New C bridge closure only – 0.1 weeks of the year plus 9 weeks due to closures during construction;
- Scenario 4 - Duke Street Bridge closure only - 3 weeks of the year.

Do Something Option 6 - replace A Bridge and maintain C Bridge

For the Do Something Option 6, the following weightings have been applied to cost skims:

- Scenario 1 - no bridge closures - 45 weeks of the year;
- Scenario 2 – New A bridge closure only – 0.5 weeks of the year plus 15 weeks due to closures during construction;
- Scenario 3 - C Bridge closure only - 3 weeks of the year;
- Scenario 4 - Duke Street Bridge closure only - 3 weeks of the year.

B.4 OAR Stage 1 Assessment 1 – Methodology – Final 20 Years

For the final 20 years of the assessment, the following has been assumed:

- Do-Minimum - A and C Bridges closed;
- Do Something 1 - A and C Bridges replaced;
- Do Something 5 – C Bridge replaced and A Bridge closed;
- Do Something 6 - A Bridge replaced and C Bridge closed.

B.5 Economic Assessment 1 – Scheme Costs

For the traffic modelling and economic assessment, the Options have been assessed over a 60 year period. As a result maintenance costs for Do Minimum and Do Something Options have been modified accordingly to represent a consistent 60 year period.

A summary of the future year maintenance costs of existing bridge structures is presented in **Table B.1**. Costs are shown for both a 40 year and 60 year assessment period. For the economic assessment, the costs covering a 60 year assessment period have been applied. The 60 year estimate is an uplift of the 40 year costs as presented in Section 4 of the ‘Technical Feasibility Report’ (Table 4.3 and 4.5). These costs are also summarised as the Do Minimum Option for the respective structure in Section 8 of the ‘Technical Feasibility Report’.

Table B.2 presents the ‘Bridge Replacement’ costs for A and C Bridges. These costs have been taken directly from Section 8 of the ‘Technical Feasibility Report’. These Bridge Replacement costs include allowance for ‘Whole Life Costs’ which is understood to take account of maintenance of the new bridge structures for a 120 year life span. The ‘Whole Life Costs’ have been scaled down to represent costs for a 60 year assessment period. These scaled down WLC costs are assumed to provide a consistent basis for comparison to Do Minimum maintenance costs.

In addition, preparation costs (covering orders, notices, design and procurement) of some £100k have been added to the cost profiles in both 2015/16 and 2016/17 as advised by Wirral Council. These costs will be split evenly between A Bridge and C Bridge Structures.

Furthermore, £10,800 per year has been added to the whole life cost of the A Bridge for both the old and new bridge to represent the machine house maintenance (as advised by AECOM on 12/09/2014).

In **Table B.3** costs have been combined from Table B.1 and Table B.2 to present the costs for the four options to be appraised for the first 40 years of the assessment. **Table B.4** presents the costs for the final 20 years – these relate only to the maintenance of the new Bridges. No costs are included for Duke Street Bridge as this is not part of the current assessment – the effect of the Duke Street Bridge closures is included only to represent the additional traffic on A and C bridges when Duke Street Bridge is closed.

Table B.1: Future Year Maintenance Costs for Existing Bridges (£k, 2014 Q2 Prices)

40 Year Assessment			
Structure	£k	Weeks	weeks per annum
A Bridge	4,032	166	4.15
C Bridge	1,630	115	2.88
Duke Street Bridge	-	126	3.15

Table B.2: Bridge Replacement Scheme Costs (£k, 2014 Q2 Prices)

	WLC 120 Years		WLC 40 Years	
	A-Bridge	C-Bridge	A-Bridge	C-Bridge
Costing	£k	£k	£k	£k
Design/ Check	200	80	200	80
Construction	3,500	2450	3,500	2450
Site Supervision	50	40	50	40
Whole life Costing	3296	1000	1099	333
Total	7046	3570	4849	2903

Table B.3: Option Scheme Costs for 40 Year Economic Assessment (£k, 2014 Q2 Prices)

	A-Bridge	C-Bridge	Preparation Costs	Total Costs
Option	£k	£k	£k	£k
Do Minimum	4,032	1,630	0	5,662
Do Something 1	4,849	1,630	100	6,579
Do Something 2	4,032	2,903	100	7,035
Do Something 3	4,849	2,903	200	7,952

Table B.4: Option Scheme Costs for Last 20 Years Economic Assessment (£k, 2014 Q2 Prices)

	A-Bridge	C-Bridge	Preparation Costs	Total Costs
Option	£k	£k	£k	£k
Do Minimum	0	0	0	0
Do Something 1	549	0	0	549
Do Something 2	0	167	0	167
Do Something 3	549	167	0	716

From reference to the supporting detailed construction costs in Appendix E of the Technical Feasibility Report, it is understood that the bridge replacement scheme costs account for risk contingency and also include an optimism bias of 30% to reflect the level of uncertainty in costs. Based on the inclusion of this optimism bias, it is not deemed necessary to include any further uplift to costs. From comparison to TAG Unit A1.2 Scheme Costs, Table 8, an optimism bias uplift of 23% is advised for Stage 2 for a bridge / tunnel structure scheme.

The Option Scheme costs as presented in Table B.3 have been taken forward for inclusion in the TUBA economic assessment.

In relation to the profiling of scheme costs, maintenance costs have been profiled in accordance with the time-intervals as presented in Section 4 of the 'Technical Feasibility Report'. Scheme preparation costs have been profiled across 2015/16 and 2016/17, design, construction, and supervision costs will be entered for 2017, and 'whole life costings' have been profiled based on information received from AECOM (11/09/2014).

The costs presented in the 'Technical Feasibility Report' have been assumed to be in 2014 (Q2) prices and for the TUBA economic assessment are converted to a 2010 price base.

Appendix C. Assessment 2 - Methodology

C.1 Introduction

This appendix sets out the methodology and assumptions for the Stage 1 traffic forecasting and economic assessment work for Assessment 2.

The objective of the Stage 1 assessment work is to identify the preferred scheme option from the following options:

- **Do Minimum** - carry out the planned maintenance programme on both A and C Bridges as detailed in the Technical Feasibility Report;
- **Do Something 1** – replace both A and C Bridges;
- **Do Something 5** – maintain A Bridge and replace C Bridge; and
- **Do Something 6** – replace A Bridge and maintain C Bridge.

C.2 OAR Stage 1 Assessment 2 - Background

The likely benefits from the proposed scheme will be accrued from the reduction in travel distance and time associated with the reduction of queues and delays connected with the maintenance programme of the existing bridges.

From reference to the ‘Technical Feasibility Report’ (*Wirral Docks Technical Feasibility Report REV P03*), it is estimated that there will be up to 166 weeks of closures for each bridge structure over a 40 year period to carry out the planned maintenance programme. This is equivalent to around 3 to 4 weeks of route diversions for each structure per annum.

C.3 OAR Stage 1 Assessment 2 – Methodology

The East Wirral Traffic Model (EWTM) has been used to model a series of future year ‘maintenance scenarios’ using a reference case forecast (constrained to TEMPRO) for the future year of 2030. The following model scenarios have been defined:

- Scenario 1 - no bridge closures;
- Scenario 2 - A Bridge Maintenance - closure of A Bridge only;
- Scenario 3 - C Bridge Maintenance - closure of C Bridge only; and
- Scenario 4 - Duke Street Bridge Maintenance - closure of Duke Street Bridge.

The bridge closures have been represented in EWTM by the inclusion of a link restriction (banned turn).

The maintenance scenarios have been modelled for the AM (08:00-09:00) peak hour, an average inter-peak hour (between 10:00 and 16:00) and PM (17:00-18:00) peak hour time periods for the identified forecast year. Time and distance cost skims have been extracted from each of the model scenarios and weighted accordingly for input into the economic assessment (TUBA).

Presented below is a description of how each of the maintenance/replacement scenarios has been treated for each option, to generate inputs for the economic assessment. The applied weightings have been

calculated based on future year maintenance estimates presented in Section 4 of the 'Technical Feasibility Report' (Tables 4.3 and 4.5). It is assumed that maintenance of the existing bridges is carried out in isolation for each bridge structure.

Do Minimum Option – Maintain All Bridge Structures

For the Do Minimum Option, the following weightings have been applied to cost skims:

- Scenario 1 - no bridge closures - 42 weeks of the year;
- Scenario 2 - A Bridge closure only - 4 weeks of the year;
- Scenario 3 - C Bridge closure only - 3 weeks of the year;
- Scenario 4 – Duke Street Bridge closure only - 3 weeks of the year.

The Do Minimum option assumes that both 'A' and 'C' Bridges will remain operational for the full 60 years of the assessment period.

Do Something Option 1 - Replace A Bridge and Replace C Bridge

For Do Something Option 1, the following weightings have been applied to cost skims:

- Scenario 1 - no bridge closures - 48 weeks of the year;
- Scenario 2 – New A Bridge closure only – 0.5 weeks of the year plus 15 weeks due to closures during construction;
- Scenario 3 – New C bridge closure only – 0.1 weeks of the year plus 9 weeks due to closures during construction;
- Scenario 4 - Duke Street Bridge closure only - 3 weeks of the year.

Do Something Option 5 - maintain A Bridge and replace C Bridge

For Do Something Option 5, the following weightings have been applied to cost skims:

- Scenario 1 - no bridge closures - 44 weeks of the year;
- Scenario 2 - A Bridge closure only - 4 weeks of the year;
- Scenario 3 – New C bridge closure only – 0.1 weeks of the year plus 9 weeks due to closures during construction;
- Scenario 4 - Duke Street Bridge closure only - 3 weeks of the year.

Do Something Option 6 - replace A Bridge and maintain C Bridge

For the Do Something Option 6, the following weightings have been applied to cost skims:

- Scenario 1 - no bridge closures - 45 weeks of the year;
- Scenario 2 – New A bridge closure only – 0.5 weeks of the year plus 15 weeks due to closures during construction;
- Scenario 3 - C Bridge closure only - 3 weeks of the year;
- Scenario 4 - Duke Street Bridge closure only - 3 weeks of the year.

C.4 Economic Assessment 2 – Scheme Costs

For the traffic modelling and economic assessment, the Options have been assessed over a 60 year period. As a result maintenance costs for Do Minimum and Do Something Options have been modified accordingly to represent a consistent 60 year period.

A summary of the future year maintenance costs of existing bridge structures is presented in **Table C.1**. Costs are shown for both a 40 year and 60 year assessment period. For the economic assessment, the costs covering a 60 year assessment period have been applied. The 60 year estimate is an uplift of the 40 year costs as presented in Section 4 of the ‘Technical Feasibility Report’ (Table 4.3 and 4.5). These costs are also summarised as the Do Minimum Option for the respective structure in Section 8 of the ‘Technical Feasibility Report’. It should be noted that the costs in the do-minimum scenario do not include M&E maintenance as robust costings were not available.

Table C.2 presents the ‘Bridge Replacement’ costs for A and C Bridges. These costs have been taken directly from Section 8 of the ‘Technical Feasibility report’. These Bridge Replacement costs include allowance for ‘Whole Life Costs’ which is understood to take account of maintenance of the new bridge structures for a 120 year life span. The ‘Whole Life Costs’ have been scaled down to represent costs for a 60 year assessment period. These scaled down WLC costs are assumed to provide a consistent basis for comparison to Do Minimum maintenance costs.

In addition, preparation costs (covering orders, notices, design and procurement) of some £100k have been added to the cost profiles in both 2015/16 and 2016/17 as advised by Wirral Council. These costs will be split evenly between A Bridge and C Bridge Structures.

In **Table C.3** costs have been combined from Table C.1 and Table C.2 to present the costs for the 60 years of the assessment. No costs are included for Duke Street Bridge as this is not part of the current assessment – the effect of the Duke Street Bridge closures is included only to represent the additional traffic on ‘A’ and ‘C’ bridges when Duke Street Bridge is closed.

Table C.1: Future Year Maintenance Costs for Existing Bridges (£k, 2014 Q2 Prices)

Structure	40 Year Assessment		
	£k	Weeks	weeks per annum
A Bridge	3,600	166	4.15
C Bridge	1,630	115	2.88
Duke Street Bridge	-	126	3.15

Table C.2: Bridge Replacement Scheme Costs (£k, 2014 Q2 Prices)

	WLC 120 Years		WLC 60 Years	
	A-Bridge	C-Bridge	A-Bridge	C-Bridge
Costing	£k	£k	£k	£k
Design/ Check	200	80	200	80
Construction	3,500	2,450	3,500	2,450
Site Supervision	50	40	50	40
Whole life Costing	2,000	1,000	1,000	500
Total	5,750	3,570	4,750	3,070

Table C.3: Option Scheme Costs for 60 Year Economic Assessment (£k, 2014 Q2 Prices)

	A-Bridge	C-Bridge	Preparation Costs	Total Costs
Option	£k	£k	£k	£k
Do Minimum	5,400	2,445	0	7,845
Do Something 1	4,750	3,070	200	8,020
Do Something 5	5,400	3,070	100	8,570
Do Something 6	4,750	2,445	100	7,295

From reference to the supporting detailed construction costs in Appendix E of the Technical Feasibility Report, it is understood that the bridge replacement scheme costs account for risk contingency and also include an optimism bias of 30% to reflect the level of uncertainty in costs. Based on the inclusion of this optimism bias, it is not deemed necessary to include any further uplift to costs. From comparison to TAG Unit A1.2 Scheme Costs, Table 8, an optimism bias uplift of 23% is advised for Stage 2 for a bridge / tunnel structure scheme.

The Option Scheme costs as presented in Table C.3 have been taken forward for inclusion in the TUBA economic assessment.

In relation to the profiling of scheme costs, maintenance costs have been profiled in accordance with the time-intervals as presented in Section 4 of the 'Technical Feasibility Report'. Scheme preparation costs have been profiled across 2015/16 and 2016/17, design, construction, and supervision costs will be entered for 2017, and 'whole life costings' have been profiled based on information received from AECOM (11/09/2014).

The costs presented in the 'Technical Feasibility Report have been assumed to be in 2014 (Q2) prices and for the TUBA economic assessment are converted to a 2010 price base.