NEW MERSEY CROSSING

HALTON BOROUGH COUNCIL ANNUAL PROGRESS REPORT
APPENDIX 1

MAJOR SCHEME APPRAISAL FOR
THE NEW MERSEY CROSSING
VOLUME 1
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EXECUTIVE SUMMARY AND KEY ISSUES

Approach to the Major Scheme Appraisal

The appraisal outlines the New Mersey Crossing proposal, indicates a preferred route, and assesses all routes that have been given consideration in the process.

The report takes on a “thought-process” approach. A description of the Halton region is followed by a discussion of the land-use, socio-economic and environmental characteristics of the area. The assessment then looks at the problems suffered by Halton, and then looks at the criteria for a new crossing.

The assessment shows how the crossing proposals fit squarely within a number of published Government White Papers, as well as regional and local planning objectives.

The report then goes on to describe each of the routes under consideration, before describing the preferred option.

Overview of Findings

The provision of a new crossing must meet the objectives laid down by the Mersey Crossing Steering Group:

- To relieve the Silver Jubilee Bridge (SJB), thereby removing the constraint on local and regional development and better provide for local traffic needs. (The crossing must provide a viable alternative route to the SJB).
- To maximise development opportunities.
- To improve public transport links across the river.
- To encourage the increased use of cycling and walking.

In order to meet these criteria, and primarily to promote the objective of an inclusive and integrated transport system, the report shows how the existing SJB should be reduced from four to two lanes of motorised traffic. The remaining width on the bridge will be dedicated to cyclists and pedestrians. Buses will use normal traffic lanes, and reliability will be increased due to lower levels of congestion.

The report considers that where the traffic shift is sufficient to allow the SJB to be reduced to two lanes, this satisfies the broad categories of:

- Safety (reduction in accidents and improved access for emergency vehicles)
- Economy (economic regeneration led by reduction in congestion and improved travel times)
- Integration (the crossing permits the promotion of an integrated transport system)
• Accessibility (as Integration)

The impact of the crossing on the environment is considered under a separate heading.

Those routes and span options that are considered not to fail the early non-technical appraisal are taken forward for full NATA assessment.

On a different level to the EIA, the report considers those criteria that do not sit well within an AST:

• Distribution and Equity
• Affordability and Financial Sustainability
• Practicality and Public Acceptability

These effects are considered fully in appendices to the report and summarised in the main text.

The MSA also considers in detail alternative strategies that might be considered rather than the provision of a new crossing. The report concludes that none of these strategies, taken together or individually, would satisfy the objectives of the Mersey Crossing Group (MCG).

Finally, the MSA considers that the project falls squarely within the tests for PFI-funded projects.

Executive Summary

Problems in Halton can be categorised into four broad headings.

• Economics and Regeneration - businesses suffer from a loss of trade, delayed business trips, deliveries to be held up, and there are reduced incentives for investment in the area.
• Social Impact – the area suffers from severe deprivation and is amongst the worst deprived in the UK.
• Traffic – The SJB carries in excess of 90,000 vehicles per day. 80% of those are non-local traffic movements with origins and/or destinations from outside the borough.
• Transportation – the congestion on the bridge makes public transport unreliable, and walking and cycling provision very poor and often dangerous.

The need for a new crossing of the River Mersey at Halton has been identified through the numerous studies that have taken place over the years. The latest tranche of assessments has identified the most suitable route for a new bridge, linking the central expressway to the south of the river, with the Ditton Road interchange to the north. The estimated cost of this project is between £291 million and £336 million at 2002 prices, and it is estimated that this will realise over £1 billion of net present value.

Crossings over the Mersey in what is now Halton, have taken place since Roman times. A ferry, the Transporter Bridge and most recently the Runcorn-Widnes Bridge have linked the north and
south banks of the Mersey. Now, Halton stands the crossroads of the northwest surrounded by the motorway box of the M56, M62 and M6. Other transport links such as the Liverpool John Lennon Airport and a series of docks are also nearby.

Runcorn's road system has developed along the classic “Buchanan” model, particularly in the New Town area. Widnes shows a more incremental growth around a town centre.

The Silver Jubilee Bridge (so named in 1977) carries in excess of 90,000 vehicles a day on 4 sub-standard lanes and demand outstrips capacity for large parts of the day. The bridge has poor facilities for pedestrians, no safe provision for cyclists and therefore severely restricts the development of integrated and sustainable transport strategies. The poor standard of the Bridge contributes to the poor road accident rate in Halton - at 0.128% of the population, the number killed or seriously injured (KSI) on Halton's roads is twice the national average.

This constraint is likely to hamper the growth of major development areas, such as Speke/Garston, Omega, Daresbury and Widnes Waterfront.

The Mersey Estuary itself is tidal, and downstream of the Runcorn Gap, it is constantly evolving. It is a site of international importance ecologically, being designated as a Site of Special Scientific Interest (SSSI) by English Nature, a Ramsar Site, a Special Protection Area for Birds (SPA) and a European Marine Site. In general the area has an industrial history, with the potential (or with evidence) for contamination. Site investigations found contamination in made ground and in natural sediments of the saltmarshes. The estuary has also suffered from a legacy of water pollution over the last century.

The Mersey Crossing Group was set up in the 1995 to define objectives that they expect a new crossing to fulfil. These are defined above.

One key issue that the new crossing must address is the promotion of an integrated transport strategy. The most attractive corridor for cycling and walking is the route of the SJB as this links the current destinations, which in turn have evolved around this crossing point. It is an essential requirement of the new crossing, that it transfers enough strategic traffic from the SJB to allow it to be reduced to two lanes of vehicular traffic. This will allow roadspace to be reallocated to pedestrians and cyclists and allow buses to move more freely within the new traffic lanes.

The new crossing proposals sit squarely within national and regional planning objectives. Locally, the crossing has been identified as one of Halton’s key strategic policies and is a prime factor of the Local Transport Plan. The crossing will also aid the strategic policies of the “Building a Better Future” corporate plan.

In total, seven crossing routes have been considered, including a tunnel. Following a high level consideration of the key issues, strategic traffic transfer and environmental degradation, the remaining options have been assessed in accordance with the Government’s New Approach to Appraisal (NATA) and Appraisal Summary Tables (AST) produced for each.

Some assessments do not fit well within the ASTs, and have been considered separately. The Social Impact Assessment clearly emphasises that the crossing is essential to help resolve the social deprivation experienced by this region. The Economic Impact Assessment has shown clear benefits and the regeneration potential that the bridge will spark.
Wide-ranging consultations have been carried out with residents, employees and businesses and travellers. Public opinion is firmly on the side of the new crossing, with over 97% of those questioned agreeing that there is a need for this project to go ahead. Statutory consultations with English Nature, the Environment Agency, the Countryside Agency, and English Heritage have also been carried out.

The outcome of the assessment is the realisation of the preferred route. The preferred route links the Central Expressway in the south via a free flow grade separated junction, across the Mersey in a generally north westerly direction, passing east of the Rhodia works, and via a short link road to Speke Road at Ditton Roundabout.

The project has been the subject of a full risk assessment exercise, and the costs have been developed in accordance with the Government’s new criteria on Optimism Bias. Sensitivity testing has also been carried out.

Alternatives to the crossing have been assessed: park and ride, rail, light rail, High Occupancy Vehicles (HOV) lanes and buses have been examined closely to assess whether there is a real need for a new crossing. The combined effect of these proposals would only relieve the SJB by around 14%, and this would be likely to be taken up with background traffic growth over the forthcoming years.

A lower cost alternative has also been assessed and an AST provided: in determining the preferred route, two span options have been considered. The more expensive longer span option has been selected as the preferred option, and the short span option as a lower cost alternative as the assessment shows that the longer spans result in less environmental degradation. The assessment shows that this proposal would not realise the benefits of the additional construction that the preferred scheme shows.

The new crossing will be the subject of ongoing monitoring through both informal means and through the points indicated in the formal monitoring register.

In accordance with the latest guidance, the scheme has been assessed against criteria for PFI funding. It is justifiable to pursue this project as a LTP major scheme and the project also meets the Government’s five tests for PFI schemes of capital expenditure, service content, operator influence, performance measurement and market interest barriers.

This route will bring substantial benefits to the region, will meet all the required national, regional and local objectives, and kick-start the regeneration the area so desperately requires.
Key Issues

• 10 of Halton’s 21 wards are included in the top 10% most deprived wards in England, representing 54% of Halton’s total population.

• At 0.128% of the population, the number killed or seriously injured (KSI) on Halton’s roads is twice the national average.

• Of the current traffic flow on the Bridge of up to 90,000 vehicles each weekday, only about 20% of all traffic movements across the Bridge are purely internal.

• Current estimates put the cost of the preferred route and structure option of the New Mersey crossing at between £291 million and £336 million at 2002 prices.

• The New Mersey Crossing will realise a Net Present Value of almost £1 BILLION.

• The new Mersey Crossing is forecast to enable:
  • 20,000 sq m of additional new and refurbished commercial floorspace;
  • 3,350 total net additional permanent jobs created;
  • £85m per annum in net additional Gross Value Added;
  • £90m increase in existing commercial property values;
  • 5% increase in average house prices

• Over 1200 people responded to the initial phase of consultation: 97.4% of those agreed that there was a need for a new bridge across the river.
**CHECKLIST**

The checklist below is extracted from the Detailed Guidance Note indicating the required documentation that has been submitted with this appraisal:

<table>
<thead>
<tr>
<th>Required Documentation</th>
<th>Supplied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear project description</td>
<td>✓ Report of Works B4027/02</td>
</tr>
<tr>
<td>Evidence that a number of realistic alternative options have been seriously considered</td>
<td>✓ ASTs for 8 route and span options (Section 12). Appraisal of Alternatives (Section 19).</td>
</tr>
<tr>
<td>Breakdown of the cost estimate</td>
<td>✓ Cost Technical Report TR17/01</td>
</tr>
<tr>
<td>Costs are in expected values (or include an allowance for risk)</td>
<td>✓ Cost Technical Report TR17/01</td>
</tr>
<tr>
<td>Cost profile of the anticipated out-turn costs</td>
<td>✓ Cost Technical Report TR17/01</td>
</tr>
<tr>
<td>Environmental impacts have been included in the appraisal</td>
<td>✓ Cost Technical Report TR17/01</td>
</tr>
<tr>
<td>English Nature</td>
<td>✓ Consultation Technical Report TR16/01</td>
</tr>
<tr>
<td>The Environment Agency</td>
<td>✓ Consultation Technical Report TR16/01</td>
</tr>
<tr>
<td>English Heritage</td>
<td>✓ Consultation Technical Report TR16/01</td>
</tr>
<tr>
<td>The Countryside Agency</td>
<td>✓ Consultation Technical Report TR16/01</td>
</tr>
<tr>
<td>Safety impacts have been included (and monetised if possible) and the assumed accident rates presented</td>
<td>✓ Accidents Technical Report TR26/01</td>
</tr>
<tr>
<td>Accessibility impacts have been included in the appraisal</td>
<td>✓ Included in the AST for each option provided at Section 12, together with relevant worksheets</td>
</tr>
<tr>
<td>Integration impacts have been included in the appraisal</td>
<td>✓ Included in the AST for each option provided at Section 12, together with relevant worksheets</td>
</tr>
<tr>
<td>A comprehensive Appraisal Summary Table is provided along with the underlying worksheets (and an electronic copy of the AST and worksheets submitted)</td>
<td>✓ ASTs for 8 route and span options (Section 12), together with relevant worksheets in supplementary volumes.</td>
</tr>
<tr>
<td>A clear explanation of the underlying assumptions used in the Cost Benefit Analysis has been provided</td>
<td>✓ Transport Economic Efficiency Technical Report TR25/01</td>
</tr>
<tr>
<td>Existing traffic flow information supplied</td>
<td>✓ Traffic Survey Technical Report TR21/01</td>
</tr>
<tr>
<td>A spreadsheet showing how the TEE table was derived and / or TUBA inputs / outputs is included</td>
<td>✓ Transport Economic Efficiency Technical Report TR25/01</td>
</tr>
<tr>
<td>Optimistic and Pessimistic scenarios have been supplied</td>
<td>✓ Transport Economic Efficiency Technical Report TR25/01</td>
</tr>
<tr>
<td>Appropriate sensitivity testing has been carried out (as outlined in the Appraisal Guidance)</td>
<td>✓ Cost Technical Report TR17/01</td>
</tr>
<tr>
<td>A Risk Register has been provided</td>
<td>✓ Cost Technical Report TR17/01</td>
</tr>
<tr>
<td>A full assessment of risk has been undertaken</td>
<td>✓ Cost Technical Report TR17/01</td>
</tr>
</tbody>
</table>
A fully worked up credible lower cost alternative has been supplied:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>With a comprehensive AST, TEE tables, and AMCB table</td>
<td>✓</td>
</tr>
<tr>
<td>With scenario and sensitivity testing</td>
<td>✓</td>
</tr>
<tr>
<td>With supporting analyses</td>
<td>✓</td>
</tr>
<tr>
<td>Plans for Monitoring and Evaluation have been outlined / considered</td>
<td>✓</td>
</tr>
</tbody>
</table>

Lower Cost/Next Best Option (Section 15) including AST Worksheets in Section 12, together with relevant worksheets in supplementary volumes.

The following supporting analyses have been completed:

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution and Equity</td>
<td>Social Impacts Technical Report TR12/01</td>
</tr>
<tr>
<td>Affordability and Financial Sustainability</td>
<td>Economic Impacts Technical Report TR13/01</td>
</tr>
<tr>
<td>Practicality and Public Acceptability</td>
<td>Consultations Technical Report TR16/01</td>
</tr>
<tr>
<td>(Evidence of public consultation supplied)</td>
<td>Annexes to TR16/01</td>
</tr>
</tbody>
</table>
1. PROJECT DESCRIPTION

1.1 Scheme Name

The scheme name is the **New Mersey Crossing**.

The new crossing is being promoted by The Mersey Crossing Group (MCG). The MCG is a partnership of:

- Halton Borough Council
- MerseyTravel
- Liverpool Chambers of Commerce and Industry
- Halton Chambers of Commerce and Enterprise
- English Partnerships
- Knowsley Council
- The City of Liverpool Council
- St Helens Council
- Sefton Council
- Metropolitan Borough of Wirral Council
- Warrington Borough Council
- Peel Holdings

1.2 Physical Description

A physical description of each option is given in the Report of Works, attached as report B4027/02. This sets out the junctions, alterations, link standards and option proposals for each route under consideration.

1.3 Cost Estimates

A full capital cost report is provided as Technical Report B4027/TR1701 – Cost Report. This includes a full risk assessment and optimum bias assessment.

With the inclusion of optimism bias, the cost of the preferred option is put at between £291 million and £336 million.

The report also includes a programme to identify the spend profile of the project.
2. BACKGROUND REPORTS

Over the years, many studies have been undertaken to assess the feasibility of a new crossing across the River Mersey in Halton. A summary of all the reports is shown in Appendix A, but the key reports and their conclusions are described below:

2.1 Mersey Crossing Study 1991-1993

(Oscar Faber for Department of Transport)

Oscar Faber were commissioned by the Department of Transport in 1991 to undertake the Mersey Crossing Study. The study found that the Runcorn-Widnes Bridge was carrying 73,000 vehicles Annual Average Daily Traffic (AADT) and was close to capacity. Demand, based on the prevailing estimates of traffic growth, was expected to reach between 118,000 and 150,000 vehicles AADT by 2016. Congestion on the existing bridge was predicted to increase to an extent that it would inevitably constrain traffic demand on the crossing.

The traffic demand profile was identified as including 50% long distance traffic (greater than 15km) and 30% local traffic (Runcorn-Widnes). The Government, whilst concluding that there was insufficient demand to justify an additional strategic (trunk road) crossing, recognised that the high proportion of local traffic might benefit from a more local crossing, which would additionally provide relief to the existing bridge.

2.2 Mersey Crossing Study Stage 1 1995-97

(Oscar Faber for Mersey Crossing Group)

The Mersey Crossing Group was formed in 1995 and appointed Oscar Faber to undertake a further "Mersey Crossing Study". The study focused on a crossing within 3km of the existing bridge, to encompass a potential extension of the A5300 to the west and links to the Runcorn Expressway at Astmoor to the east.

The brief was to provide a local crossing to improve local accessibility across the river, to relieve the existing bridge and to facilitate future developments along the banks of the Mersey. Stage 1 involved the identification and assessment of nine feasible options and concluded with a recommendation to consider three routes (western, central and eastern) at Stage 2.

At this time, it was noted that routes to the west of the Silver Jubilee Bridge (SJB) would pass

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directly over the Mersey Estuary Special protection Area (SPA).

Impacts of the bridge piers on the SPA, including direct disturbance of birds and their habitat, noise impacts on birds and significant changes to the sediment dynamics of the SPA area, would almost certainly be severe. It is considered that even with implementation of mitigation measures, those routes would result in unacceptable environmental degradation. These routes were subsequently rejected.

2.3 Mersey Crossing Study Stage 2 1998-1999

(Oscar Faber for Mersey Crossing Group)

Within Stage 2, three options were evaluated in terms of their traffic, economic development, and environmental and engineering impacts. Other impacts are discussed elsewhere in this report, but in terms of traffic impact, all the options were considered to provide better access across the river and relief to congestion on the existing bridge.

The traffic model prepared and validated as part of the 1991 study, on the basis of 1991 Roadside Interviews, was updated to 1996 and used to compare the impact of the different options. The assignment technique used constrained capacity but did not allow for any suppression of demand resulting from levels of congestion on the network. A do-minimum forecast was also prepared and cost-benefit analysis of all was undertaken.

The following results, taken from the Stage 2 report, give an indication of the relative merit of the options considered:

- Whilst central and eastern routes appeared comparable, a note of caution was raised over whether the number of piers in the estuary to achieve the most economic crossing solution would be acceptable on environmental grounds.

- The study recommended the eastern option be chosen as the route for a new crossing of the Mersey.

2.4 Mersey Crossing Study - Integrated Transport Solution 1999-2000

(W S Atkins for Mersey Crossing Group)

Work was taken a stage further by W S Atkins, whose brief was to examine in greater detail a new eastern crossing of the river, including new transport data and consideration of an integrated transport approach.

The report was based on origin and destination surveys undertaken in November 1999 by Oscar Faber and was prepared to allow specific proposals to be incorporated within the Halton Local Transport Plan (LTP).

In terms of public transport (buses) the report concluded that a second crossing, in conjunction with the existing crossing, could provide a more frequent and reliable cross-river service. However it was noted that cross-river traffic should not be at the expense of or to the detriment of public transport services operating solely on one bank or the other.
The study assumed an opening year of 2010 and considered growth based DfT trip-end forecasts at district level to produce design year forecasts for 2025. The study also considered both constrained and unconstrained forecasts. In the case of the former the effects of congestion and tolling were assumed to be similar and were taken to limit trip growth to the lower end of the trip end projection range. High growth was applied only in areas where the potential for development could be identified.

Traffic modelling was undertaken using a local traffic assignment model, which included detailed coding of junctions in the vicinity of the crossings with less detailed coding applying to more remote junctions.

The study considered a do-minimum solution, a duplicate bridge alongside the existing and four options linking two potential terminal junction locations on either side of the river in different ways. The study concluded that the Central Expressway to east of Allbright and Wilson (now the Rhodia works) route was the best performing option but the most expensive.

2.5 Regional Transport Strategy

In May 1999, the Minister for Transport indicated that a New Mersey Crossing would need to be justified through the Regional Transport Strategy. This process has been described at length in Halton’s Local Transport Plan. Halton have been working hard to fulfil the Minister’s suggestions that interim measures should be carefully considered. Many schemes have been implemented, most recently a casualty reduction scheme across the bridge itself.
3. TRAVEL PATTERNS AND LAND USE

3.1 History of Runcorn Gap

There were probably crossings of the Mersey between Runcorn and Widnes in Roman times, but there is recorded evidence that the Runcorn Ferry operated across the Mersey between Runcorn and Widnes (the so-called “Runcorn Gap”) since 1189.

The Ferry had been in operation for over 600 years before the development of engineering skills gave rise to thought about the practicality of building a bridge to enable people, animals and goods to cross the river without being subject to the vagaries of the weather or tide. Various ideas were put forward over the years although none of them were realised. The first fixed crossing was the Aethelfleda Railway Bridge, constructed in 1868.

The Manchester Ship Canal was promoted by the Manchester Ship Canal Act of 1885. Construction started in November 1887 and the canal was opened on 1 January 1894.

In 1905 the Transporter Bridge - a tolled crossing - opened that allowed road vehicles to cross the Runcorn Gap but the rapid increase in traffic soon exceeded the bridge’s capacity.

In April 1956, construction began on the Runcorn-Widnes Bridge at a cost of nearly £3m, and was opened on July 21st 1961 by HRH Princess Alexandra of Kent. The Transporter Bridge closed in 1961 the day after the new bridge was opened.

The Runcorn-Widnes Bridge was completed in 1961 but by 1975, traffic growth had once again outstripped the capacity of the bridge and work was put underway to widen the deck to provide four lanes of traffic. The Bridge was renamed in 1977 to the Silver Jubilee Bridge (referred to hereafter as the SJB).

3.2 Halton and Widnes Area

The Borough of Halton stands at a strategic crossing point of the Mersey estuary. It provides the main rail connection on the West Coast Main Line (Liverpool Branch) and the A533 road link via the SJB as shown in Figure 3.2.

The M56 to the south of the Borough links West Cheshire and North Wales with Manchester; the M62 to the north links Merseyside to Manchester and to Yorkshire; and the M6 to the east is the main arterial route between the north-west region and the rest of the country. The major movement across the Bridge is in and out of Liverpool from Runcorn, Vale Royal, Chester and North Wales.
The expressway network in Runcorn provides fast links from the M56 via the Bridge to the M62 by the Widnes Eastern By-pass providing an important diversionary route for the M6 particularly at the Thelwall Viaduct. The Bridge is a key point of access to the motorway network for the Speke/Garston development area and is an important strategic gateway into south Merseyside.

The A553, carried by the SJB, is a principal road maintained by Halton Borough Council. The A562 connects Halton with south Liverpool and the A557 connects Halton with the M62. The regional and national importance of this road can be seen above in Figure 3.3.

Using the Manchester Ship Canal, the Mersey Estuary carries docks at Runcorn and Weston Point. Travel and freight movement by air are nearby at Liverpool John Lennon Airport and Manchester International Airport.

The Manchester Ship Canal passes along the south side of the estuary and, although not as frequently used as it once was, still provides passage for sea-going vessels requiring significant headroom. The Bridgewater Canal, a popular leisure facility for boat users, commences near the centre of Runcorn Old Town and runs eastwards alongside the Bridgewater and Daresbury Expressways. The St Helens Canal commencing near West Bank runs eastwards on the north side of the estuary. This canal is currently disused but retains a significant leisure role, with the towpath providing the route for the Trans-Pennine Trail for walkers and cyclists.

The Liverpool to London Euston rail line provides travel between Halton and the capital in less than two-and-a-half hours, and there are regular services to Cardiff and the south coast of England. Locally, Hough Green Station in Widnes is linked via Hunts Cross to the Merseyrail system, while the station at Runcorn East is on the main rail line connecting Chester with Warrington, Manchester, Leeds and the North East of England.

The River Mersey is crossed in four locations to the west of the M6 presently:

- Thelwall
- Small local bridges in Warrington
- Tunnels
- Silver Jubilee Bridge
3.3 Runcorn

The road system in Runcorn is based around an expressway and busway system, with employment areas on the outside of this network, residential areas in the inside and the new town centre (Halton Lea) in the middle. In each of the New Town housing areas there is a local centre. This layout is a classic form of the “Buchanan Model”.

The busway does not run within some of the Old Town areas or to some of the newer employment and residential areas such as Manor Park or Sandymoor. Initially it was proposed that each New Town neighbourhood would be distinct without road links to other areas, other than via the busway and expressway.

Temporary links made during construction were not removed in some cases. Consequently, the ability to drive between neighbourhoods in the private car is easier than anticipated. There is a network of cycleways and footpaths throughout Runcorn separate from the road system.

Runcorn has two railway stations, a main line station on the Liverpool to London line and a further station on the Manchester to Chester line. There are various rail sidings for freight within the Docks areas to the west of Runcorn. This area is also alongside the Manchester Ship Canal with its associated docking facilities.

Generally, new development land is now concentrated towards the eastern edge of the town away from public transport nodes including the busway.

3.4 Widnes

Widnes has developed as a traditional manufacturing town with the main industry being to the south along the River Mersey, and housing and the town centre towards the north.

As with the Runcorn New Town there are local centres within the residential areas, but these have been developed over the years rather than being planned centres. The road system has also developed in this way.

In Widnes, there has been incremental infrastructure growth with roads and other transport modes being planned as individual developments. The latest of these schemes was the development of the A557 Widnes Eastern Relief Road running from the M62 to the River Mersey crossing. This has freed up the internal road network for more local traffic.

Widnes possesses only a short length of dedicated cycle path (on Kingsway) and was created as a direct result of the opening of the Eastern Relief Road.

There are two rail stations in Widnes both on the Liverpool to Manchester line. There is no rail link between Widnes and Runcorn due to the closure of Ditton Station in Widnes. Several freight lines into employment areas exist, particularly into the West Bank Dock estate and into the south-east Widnes employment area. Pedestrianisation has taken place within the town centre and a variety of pedestrian routes exist throughout the area.
3.5 Silver Jubilee Bridge

The single carriageway across the SJB has four sub-standard lanes, of total width 12.2 metres. These lanes can carry over 90,000 vehicles per day. The bridge has poor facilities for pedestrians, no safe provision for cyclists and therefore severely restricts the development of integrated and sustainable transport strategies, since high levels of congestion affect the reliability of public transport.

Although the bridge is classified as urban by virtue of its speed limit, it is rural by character and appearance. It has been observed that the bridge can carry more than the theoretical design capacity of 5,000 vehicles per hour, and in some cases will free flow with in excess of 5,000 vehicles per hour.

The constrained capacity of the SJB is the control point on the entire road network. Large queues develop in the AM and PM peaks as a result of this limitation.

3.5.1 Congestion Reference Flows

At Appendix B, we have undertaken an assessment of the Congestion Reference Flow (CRF) of the SJB in accordance with Annex D of TA46/97. The CRF of a link is an estimate of the AADT flow at which the carriageway is likely to be congested in the peak periods of an average day. Congestion is defined as the point at which the hourly traffic demand exceeds the maximum sustainable hourly throughput of the link.

The CRF for the SJB at present is calculated as 64,700 vehicles per day. Consequently, it can be clearly seen with daily weekday flows on the SJB in the region of 90,000 vehicles per day, that the demands on the bridge far exceed its capacity. This heavy demand is manifested in large queues on the approaches to the SJB.

3.6 Development Areas

This area of the country is currently undergoing a massive regeneration and redevelopment. Development areas of Speke/Garston, Omega, Daresbury and Widnes Waterfront will provide many thousands of jobs in a much-deprived region.

Freight movements to, from and through the area will be enhanced with the creation of the proposed Ditton Freight terminal.

These areas are described in more detail in Section 4 of this appraisal.
3.7 Existing Travel Patterns

31% of Halton residents work outside the Borough. This is relatively low compared with the County average of 34%. The current modal split of travel is as indicated in table 1 below:

<table>
<thead>
<tr>
<th></th>
<th>Residents</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Car</td>
<td>67%</td>
<td>71%</td>
</tr>
<tr>
<td>Public Transport</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>12%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Table 1: Modal Split of travel for journeys to work by residents and employees of Halton

In terms of journey length, table 2 below indicates typical length of trips to work:

<table>
<thead>
<tr>
<th></th>
<th>Residents</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5km</td>
<td>62%</td>
<td>57%</td>
</tr>
<tr>
<td>5km – 9km</td>
<td>16%</td>
<td>17%</td>
</tr>
<tr>
<td>Greater than 9km</td>
<td>12%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Table 2: Trip length for journeys to work by residents and employees of Halton

It can be seen from the foregoing that although the majority of journeys are less than 5km, most journeys are undertaken by private car. There appears to be therefore, a potential for a modal shift away from the private car and towards other, more sustainable, forms of transport.

3.8 Accident Analysis

Halton’s LTP identifies the road safety problems of the Borough. At 0.128% of the population, the number killed or seriously injured (KSI) on Halton’s roads is around twice the national average.

The following table indicates the accident figures quoted in Halton’s LTP and also includes data for 2001, the latest year for which data is fully available.

<table>
<thead>
<tr>
<th>Year</th>
<th>KSI – all ages (No.)</th>
<th>KSI – children (No.)</th>
<th>Slight casualties (Rate per 100 million vehicle-kilometres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994 – 1998 average</td>
<td>157</td>
<td>33</td>
<td>86</td>
</tr>
<tr>
<td>2001</td>
<td>69</td>
<td>20</td>
<td>90</td>
</tr>
<tr>
<td>2010 residual target</td>
<td>60% (94)</td>
<td>50% (16)</td>
<td>90% (77)</td>
</tr>
</tbody>
</table>

Table 3: Accident analysis for Halton Borough
The LTP recognises that the casualty reduction targets are challenging. Nevertheless, the 2001 data shows significant improvement in KSI accidents, particularly in the “all ages” category.

The European Road Assessment Programme (EuroRAP) graded major UK roads according to their safety record. The A533 from Widnes to the A56 was ranked as the 7th most dangerous road in the UK.

A full monetised accident analysis has been undertaken and is attached in the Accidents Technical Report TR26/01.
4. SOCIO-ECONOMIC CHARACTERISTICS AND PROBLEMS

4.1 Social Overview of Halton

In 1974, areas either side of the river were united under Halton Borough, which then became Halton Unitary Authority in 1998. Prior to that, the Borough had been part of Cheshire County Council. The construction of the Silver Jubilee Bridge (SJB) and the combination of these two communities under Halton Borough Council removed the physical divide created by the Mersey.

The 2001 Census showed that the borough has a population of 118,200.

A report produced by Halton Borough Council, the *Index of Multiple Deprivation 2000: A Halton Perspective* revealed that Halton was ranked as the 18th most deprived local authority in England and 4th in the North West for its average of Ward Ranks. Ten of Halton’s 21 wards are included in the top 10% most deprived wards in England, which represents 54% of Halton’s total population. This suggests that deprivation is widespread across the whole of Halton rather than being concentrated within small pockets.

Traffic flows are shown to exceed capacity at peak times, which is thought to be a constraint on the development of the local and sub-regional economy. Businesses suffer from congestion associated with the current bridge, which can often cause:

- a loss of trade
- delayed business trips
- employees to arrive to work late
- employees to return home late
- deliveries to be held up
- reduced incentives for investment in the area
- difficulties in cross-river staff recruitment

The net effect of this is that businesses are not likely to be attracted to Halton and employment rates are likely to remain low.

Halton Unitary Authority has identified key areas for the focus of regeneration in the future, which include Runcorn Promenade, Widnes Waterfront and Castlefield. These areas are included in the Single Regeneration Budget’s (SRB) for the Runcorn on the Mersey, Realising the Benefits and Focus for Change programmes. The SRB is aimed at tackling social exclusion and improving local economies and communities.

Further information on the Social characteristics of Halton can be found in Technical Report B4027/TR12/01 – Social Impacts.
4.2 Economic Overview of Halton

An Economic Impact Assessment has been undertaken and is presented as Technical Report B4027/TR13/01 – Economic Impacts.

Economically, Halton is deprived. Within the area of influence of the proposed NMC are areas of the North West region exhibiting some of the most acute levels of social and economic deprivation in England. The Merseyside districts of Liverpool, Knowsley and St Helens include 49 wards identified as being in the worst 10% of all wards in England. In total there are some 76 wards considered on the basis of a "basket" of indicators to be particularly deprived.

As a consequence of this, work is underway to regenerate this region, and there follows a summary of the key projects currently being undertaken.

4.2.1 Widnes Waterfront

The New Widnes Waterfront Vision will become part of the North West's most strategically important "Metropolitan Axis" along the M62 Corridor with the "Southern Crescent" along the M56. Sites that have been unused for years will be regenerated into a major regional development of commercial offices, tourist and leisure facilities and industrial developments.

[Image: Halton's Promotional Literature for Widnes Waterfront]

Improvements to public transport together with new cycleways and pedestrian routes around the New Widnes Waterfront Vision area will be at the hub of the new developments, opening up new opportunities as the area is developed.
As it is developed over the next six years the Halton Partnership will utilise £8m of European Regional Development Funds to lever a further £70m of investment into the project. The project will create over 2700 new jobs in Widnes.

4.2.2 Ditton Freight Terminal

In 1999, the Merseyside Freight Study was commissioned. The study examined ways to add to economic growth for Merseyside through the freight industry. It examined more than 50 sites potentially suitable for freight-related developments, including the emerging concept of “freight villages” – significant clusters of distribution uses making particular use of rail/ water connections.

The strategy selected 4 of the 50 sites, and included Ditton. They saw potential at Ditton for the development of a major freight village incorporating the two existing inter-modal users, bringing into play redundant land and creating a new road link to the A5300 Knowsley Expressway. This recommendation was followed up by a preliminary approach from potential developers to explore the prospects for this kind of development. It appears from the market perspective that the Ditton location is highly suited to the freight village concept, with ultimate potential for as much as 300,000sq m of floor space, linked to substantial new sidings capable of handling European “trainload” volumes of freight.

4.2.3 Speke/Garston

Speke Garston Development Company (SGDC) is a joint venture established by English Partnerships and Liverpool City Council in 1996 to assemble land and create a portfolio of sites for modern industrial and service industry use. It is a specialist urban regeneration delivery vehicle working in partnership with other specialist organisations to bring about the comprehensive economic, social and physical regeneration of the Speke Garston area.

As a result, Speke Garston is one of the most exciting regeneration areas in the UK. A massive capital programme and significant inward investment is supported by an innovative approach to Community Engagement, Educational Achievement and Cultural Development.

The Speke Garston area suffers from high levels of social exclusion due to above average occurrence of poverty, unemployment, ill-health and educational under attainment.

4.2.4 Omega

Omega is a commercial business park development opportunity of international significance. The 226-hectare (558-acre) site will have direct motorway access, and has the potential to accommodate some 650,000 sq m of development space and more than 12,000 jobs.

The master plan allows for a high quality business park, primarily offices, with some allowance for distribution on the area of the site to the north side of the M62. Building and infrastructure costs of the development will amount to around £600m, in addition to the estimated £28m cost of the new M62 Junction 8.
The site is owned by English Partnerships and development is likely to continue over the next 20 years.

Target sectors for Omega include pharmaceutical/medical, IT/data sciences, biotechnology, telecoms and advanced automotive.

4.2.5 Daresbury

Daresbury is vital to the future economic prosperity of the Northwest region and Merseyside. There are three sites, which collectively represent a massive existing investment in scientific research and high technology, and great potential alongside the development of production capability at Speke Garston for leading the region into the further development of knowledge based industries. The three sites are:

- The existing Daresbury Laboratory in which the Government has agreed a substantial investment in the CASIM project (Centre for Accelerator Science, Imaging and Medicine) – a partnership between Daresbury, North West Universities and the Health sector, which will ensure Daresbury provides a next generation research capability.

- Immediately adjacent to the laboratory will be the Daresbury Science Park, currently a 13-acre greenfield site, acquired by NWDA, which will exclusively provide for incubator units for spin out businesses from the laboratory. The potential is for 72,000 m² of premises and 750 jobs.

- Daresbury Park is one of NWDA's designated strategic sites immediately adjacent to junction 11 of the M56 motorway. This private sector development of a high quality office park is already well underway. Three buildings are already built and occupied and a further two are under construction, totalling over 80,000m². The plan for Halton's prestigious Daresbury Park development envisages around £220 million of investment over the next fifteen years and the creation of 1.6 million square feet of new office space. This will potentially result in 12,000 new jobs.
5. ENVIRONMENTAL SETTING

This section provides detail on the key aspects of environmental setting of the study area for the New Mersey Crossing. These include the following:

5.1 Hydrology

The Upper Mersey Estuary is characterised by a series of banks and channels, which show lateral movement and are usually exposed twice daily by the tidal rhythm. In the study area, the sub-tidal channels have decreased in depth and width, whilst the intertidal/supratidal areas have accreted vertically.

In common with many other UK estuaries, the Mersey Estuary has been infilling throughout the Holocene period (circa 7000-5000 BP). Over the last several hundred years the estuary has been subject to substantial anthropogenic modification. As a whole, the estuary has not reached an equilibrium form. In the future, the general trend for siltation in the study area is likely to continue, with the rate of siltation dependent on the balance of marine to fluvial sediment supply.

5.2 Terrestrial Ecology and Birds

The Mersey Estuary to the west of the existing bridge is of national and international nature conservation importance for its estuarine habitats and associated birds and other wildlife. It is designated as a Site of Special Scientific Interest (SSSI) by English Nature, Ramsar Site, Special Protection Area for Birds (SPA) and European Marine Site.

The Mersey Estuary is important for seven regularly occurring species of wintering wildfowl and wading birds. The Estuary also contains large areas of salt-marsh with extensive sand-flats and mud-flats, which are important for feeding and roosting wildfowl and waders. The intertidal areas are Priority Habitats in the UK Biodiversity Action Plan. In addition, the power station lagoons, adjacent to the estuary, attract many maritime and other bird species including large numbers of wildfowl and waders associated with the estuary.

Other important habitats and sites in the area of the proposed New Mersey Crossing are as summarised below:

- The Manchester Ship Canal Bank at Astmoor SBI and Site of Importance for Nature Conservation (SINC) is important for its colonies of orchid species including Bee Orchid and other unusual plants of lime-rich soils such as Grass Vetchling, and butterflies.

- Haystack Lodge SINC is an area of grassland, tall-herb vegetation, scrub and copses, which is of particular importance for its plants, butterflies and moths.

- The Disused St Helens Canal Grade A SBI is of county importance for its reedbeds and aquatic wildlife that includes Water Voles, birds, fish, dragonflies and other invertebrates. The reedbed is a Priority Habitat and protected species are present.

- Norbury Wood and Marsh Grade C SBI are valuable for its wetland vegetation, plants, Water Voles, breeding birds including a heronry, and butterflies. Associated with this urban fringe site is Oxmoor Nature Reserve that includes open water habitats and reedbeds.
• Lodge Plantation Grade C SBI is a broadleaf plantation woodland that is important in an urban context for its developing Bluebell colonies and ponds that support Great Crested Newts.

5.3 Aquatic Ecology

Generally, low numbers and few species of invertebrates have been found living in the estuarine sediment. However, high numbers of shrimps and juvenile fish were recorded living on the sediment surface. These animals move with the tides and are thought to provide food for larger fish including flounder, herring, sand goby and pipefish. The upper Mersey Estuary acts as a nursery for estuarine fish with different species inhabiting the area at different times of the year. Furthermore, the small shallow depressions on Astmoor Saltmarsh hold water at low tide and contain large numbers of small fish including sand goby and sea bass.

5.4 Soils, Geology, Groundwater and Contamination

The geology in the study area consists of made ground overlying glacial deposits that have formed across the study area, except parts of Wigg Island & Astmoor Salt Marsh, the Mersey Estuary (and at the existing Silver Jubilee Bridge (SJB)) and parts of Runcorn (close to the Manchester Ship Canal). These glacial deposits comprise of glacial till (boulder clay) and sands & gravels. Alluvial material, associated with the River Mersey, is present on the salt marshes and the sand banks. Bedrock in the area is comprised of red sandstone.

In general the study area has an industrial history with the potential (or with evidence) for contamination. Site investigations found contamination in made ground and in natural sediments of the saltmarshes.

On the northern side of the river, the part of Widnes covered by the study area was historically used predominantly for heavy industry, with numerous chemical works noted on historical maps prior to the 1960’s.

To the south of the river, in Runcorn, there is evidence of industrial development with chemical and other industrial land uses around the southern end of the existing crossing and along the northern side of the Manchester Ship Canal.

Analysis of soils samples from the study area indicates elevated concentrations of contaminants in the made ground in Widnes and Wigg Island (Runcorn). A broad range of contaminants were noted, which appear to be related to historical activities including the following:

• Numerous alkali works – contaminants may include sulphides, metals (e.g. arsenic, copper and zinc) and extreme pH values

• Other chemical works – covering a wide range of potential contaminants depending on processes and quantities of waste, but includes chlorides, metals, organic solvents, cyanides, phosphates and pesticides
• Gas works – metals, cyanides, sulphur compounds, ammonium salts, phenols, benzene, PAHs, alkaline/acidic wastes, and ground gas (methane, carbon dioxide, hydrogen sulphide, hydrocarbons, hydrogen cyanide and ammonia)

• Railway land – this includes existing land and numerous railway lines shown on historical OS maps, where contaminants may include metals, creosote, petroleum hydrocarbons, solvents, pesticides and asbestos

• Demolition (all sites) – potentially wide range of contaminants dependent on site use

• Landfills – there are a number of areas where land-filling and land-raising has been identified on, or adjacent to the proposed routes. This includes the Johnsons Lane Tips on the northern shore and historical tipping on Wigg Island in Runcorn.

5.5 Surface Water Quality

The Mersey Estuary has suffered from a legacy of water pollution over the last century. This legacy is attributed to inadequate sewage treatment facilities, poor storm water retention resulting in frequent sewage discharges from combined sewer overflows, industrial discharges and runoff from agriculture and contaminated land. As a result of these factors the Mersey estuary has obtained a reputation of being one of the most polluted waterways in Europe.

However, since the mid 1980’s the water quality within the estuary has been slowly improving as a result of improved sewage treatment facilities, a reduction in industrial discharges, changes in permissible discharges and also as a result of the Mersey Basin Campaign (launched in 1985).

5.6 Air Quality and Climate

No Air Quality Management Areas have been designated in Halton as it is thought that air quality objectives, specified in the Air Quality Strategy (2000), are likely to be achieved. Past studies carried out by Halton Borough Council suggested the possibility of some localised elevated levels of NO₂ and PM₁₀. Following A Review and Assessment of Air Quality in November 1999, it was shown that objectives for NO₂ and PM₁₀ would also be achieved. If local air pollution were to exceed the air quality objectives it is likely that the human health of individuals and families in surrounding areas would be at risk. Of particular concern would be vulnerable members of the surrounding population such as the elderly and those of poor health.

5.7 Landscape and Visual Amenity

The landscape of the study area has not been formally classified as being of either national or regional significance but is nonetheless of considerable importance on a local and probably sub-regional context. Within the study area the following four distinct landscapes have been identified:

• The expanse of salt marsh, mudflats, sand banks and tidal channels which characterise the area between the SJB and Fiddlers Ferry Power Station.

• The degraded industrialised margins of the estuary containing the Manchester Ship Canal, St Helens Canal, road and rail corridors and industrial units of varying scales.
• The north facing slopes of Runcorn and Halton containing mixed urban development which overlook the estuary and culminate in the focal / vantage point of Halton Castle.

• The townscape communities of Runcorn Old Town and West Bank, Widnes (part of which is a Conservation Area) which, in contrast to the expansive estuary are small scale, intimate and insular.

Within the region, the Strategic Views of the Mersey initiative has identified main vantage points overlooking the Mersey with an aim of protecting the views. These considerations have been taken into account in formulating the landscape and townscape management plan.

5.8 Cultural Heritage

The following aspects of cultural heritage have been identified within the New Mersey Crossing study area:

• A crossing point of the Mersey at Runcorn Gap is documented in the medieval period, but such a crossing may have been used from the Roman period. There is a possibility of retrieving Roman evidence in the Runcorn Gap area related to ferries and riverside/port activities along the foreshore (through ground disturbance works).

• A Saxon burh (fortified stronghold) was established at Runcorn in 915 AD and whilst much of the burh has been removed by later settlement, industrial activity and previous bridge construction, some remains of heritage interest could survive below ground in that area.

• The flourishing industrial development in the late-eighteenth and nineteenth centuries within the Runcorn and Widnes area has left a high potential for the recovery of evidence related to a wide range of industrial sites and associated infrastructure. The two existing bridges between Runcorn and Widnes are listed and so any development in their vicinity must take account of their setting, as well as any direct affect on the fabric of the structures.

• Within the estuary there is also a potential for uncovering sunken boats, especially Mersey Flats (some of which have been abandoned and subsequently sunk, or have been deliberately sunk to control riverbank erosion). Whilst there are no records of wrecks in the general area, this does not preclude the finding of sunken boats.

5.9 Noise

There is no background data on noise pollution for Halton and it is not part of any noise reduction strategy. However, there are numerous residential areas located close to the SJBand other busy road links in Halton, which are likely to experience traffic-related noise pollution.
6. PROBLEM IDENTIFICATION AND MITIGATION

Problems in Halton can be categorised into four broad headings.

- Economics and Regeneration
- Social Impact
- Traffic
- Transportation

Within each of these headings, there are a number of sub-problems, and specific mitigation measures that can be identified.

These problems have been identified after close consultation with the local residents, businesses, interest groups and transport operators.

6.1 Economics and Regeneration

The Bridge impacts on the local economies of Runcorn and Widnes, the Merseyside Objective 1 area and a major part of the North Cheshire designated Objective 2 area. It is a constraint on the economic development of the sub-region and severely restricts the development of integrated transport strategies.

A new crossing will:

- Relieve the Silver Jubilee Bridge;
- Encourage development and bring about regeneration of the area.

Improved communication will:

- Encourage existing businesses to expand;
- Encourage new businesses to set up;
- Bring new jobs and generate wealth.
- Make it easier to travel to work.

6.2 Social Impact

The Social Exclusion Unit (SEU) was set up in 1997. It works with departments across the Government to find solutions to some of the many social problems in England and acts as a catalyst for change at the heart of Government. The work of the SEU forms part of the Government's strategic approach to tackling social exclusion including all Whitehall departments and many external partners.
The *New Commitment to Neighbourhood Renewal: National Strategy Action Plan* (2002) was produced by the SEU to address neighbourhood deprivation problems. It identified that a major cause of the spiralling decline in many neighbourhoods across England were created by the decline of old industries, which lead to mass unemployment greatly affecting vulnerable communities. The two main goals of the SEU’s Neighbourhood strategy are:

- In all the poorest neighbourhoods, to have common goals of lower worklessness and crime, and better health, skills, housing and physical environment
- To narrow the gap on these measures between the most deprived neighbourhoods and the rest of the country

The SEU is particularly relevant to Halton given that it has a number of highly deprived areas within the borough, and the new bridge will act as a catalyst to stimulate this renaissance.

From the social impact assessment, it is clear that doing nothing, although having the benefit of no disruption to communities, does not solve the problems of increasing congestion and will limit the community regeneration potential of the area. The construction of a new crossing will go towards improving the long-term quality of life experienced by many residents.

### 6.3 Traffic

#### 6.3.1 Personal Injury Accidents

PIAs have been assessed in the Mott Macdonald report *Review of Existing Network (200519/04/A)*. This report describes studies that have been undertaken to review the existing road network as part of the Local Transport Plan Framework with Halton Borough Council.

The report investigates accidents on the SJB and on both the northbound and southbound approaches and found that the majority of accidents involved rear end shunts of vehicles held up on the bridge. Many of these accidents may have been caused by excessive speed and the misjudgement of speed or distance, another significant causation factor was vehicles colliding whilst changing lanes.

The report also considers the impact of the traffic flows on the accident record of the SJB. The report considers that, in general terms, capacity reduction could be a way of reducing accidents. However it recognizes that flows across the bridge are high, and capacity reduction by any significant amount through local initiatives designed to influence modal choice may be limited.

The report concludes that a new bridge over the Mersey to the east of the SJB is the preferred long term option from an economic and transport view.

#### 6.3.2 Access for Emergency Vehicles

Access for emergency vehicles has been identified as a concern of the public and of the services themselves.

- Access to incidents on the SJB such as collisions, dropped loads and potential suicides is very difficult.
• Access to incidents across the bridge is hindered by congestion, and recently threats were made to blockade the SJB.

• There is a lack of alternative routes. Insufficient public warning and the narrow lanes and volume of traffic exacerbate the problems.

• The number of chemical incidents recorded in Halton has been increasing annually since records began in 1998. Some of these incidents have threatened closure of the SJB.

• Congestion on the SJB makes access to incidents on the opposite side of the bridge difficult. In the event of a “cloudburst” incident a large number of vehicles may need to be transferred from one side of the river to the other.

• If the SJB is closed the approach roads also get blocked which increases attendance times to many areas of Runcorn and Widnes, particularly as there is a lack of alternative routes to bypass any congestion.

6.3.3 Strategic Traffic Movement

Of the current traffic flow on the Bridge, which can exceed 90,000 vehicles each weekday, only about 20% of all traffic movements across the Bridge are purely internal, i.e. between Runcorn and Widnes. 41% are trips across the region but with either their origin or destination in the Borough of Halton. 39% are using the Bridge entirely as a through route across the region.

The impact of the use of the crossing by strategic and cross-region traffic is a major problem to the regeneration of the area.

By its very nature, a new crossing will segregate regional crossing traffic to leave primarily local traffic using the SJB.

6.3.4 Congestion

Congestion, due to the capacity limitation of the SJB, seriously impacts on transport movement and accessibility and potentially inhibits future development.

The highest traffic flow ever recorded – 91,534 vehicles - crossed the SJB in a 24-hour period on Friday 20th June 2003. As the bridge gets older and traffic levels continue to rise, congestion will worsen, structural deterioration on the bridge will increase, and essential maintenance will become more and more disruptive.

The current daily flows are nearly double the design capacity for the four sub-standard 3.05m wide lanes. The SJB is seriously congested and there is evidence of peak hour spreading as shown in the Figure 6.1 below – these peaks now cover a three-hour period for both the morning and evening periods. Facilities are poor for pedestrians and there are no safe facilities for cyclists.

It can be seen that over the past few years for which data is available, there has been a constant flow of traffic in the main peak hours. It is the shoulders of the peak hours that have experienced the largest traffic growth – clear evidence of peak hour spreading in Halton.
Future growth in traffic flows seeking to cross the Bridge would force trips on to alternative routes, impacting on the Mersey Tunnels and the M6 motorway, particularly at the Thelwall Viaduct.

For example around 10,000 vehicle trips a day [12.5%] are currently being made across the Bridge to or from Greater Manchester and points further to the north and south. These trips currently choose the Bridge in Halton rather than the M6 across the Thelwall Viaduct, which may be a more obvious alternative route.

The crossing will resolve these issues in the following ways:

- Increased cross-river capacity and therefore reduced congestion and delays;
- Reduced journey times and fuel costs;
- An alternative route will be available during future planned maintenance on the SJB.

### 6.4 Transportation

#### 6.4.1 Availability of Public Transport

There is a lack of viable alternative modes of transport that can be used apart from the car.

With only one in five vehicles making trips across the Bridge that are purely internal to the Borough, the potential impact of Halton’s strategies encouraging the use of alternative modes is limited. The Borough’s strategies contained in the Halton LTP do give high priority to alternative modes with, for example, bus lanes with availability for cycle use on the approaches to the Bridge. It is clear however, that only with a second crossing can real changes to modal choice be made.
With a new crossing:

- The reliability of existing routes will be improved
- Priority measures for buses can be provided
- Opportunities for new bus routes are available
- Other forms of transport could be facilitated in the future

6.4.2 Pedestrian and Cyclist facilities

There are presently no dedicated cycleway facilities between Runcorn and Widnes, hindering Halton’s aims to reduce dependency on the private car for cross-river traffic.

Within the scheme for the new crossing:

- Facilities for cyclists on the existing SJB will be provided, with enhanced facilities for pedestrians.
- Links to existing cycling and pedestrian facilities will be provided.
- Links to public transport using the crossings can be provided.
7. ASSESSMENT AGAINST LOCAL OBJECTIVES

7.1 Mersey Crossing Group Scheme Objectives

In response to the problems outlined in Section 6 above, Halton Borough Council and the Mersey Crossing Group have defined the objectives that they expect a New Mersey Crossing to fulfil.

The main objectives of a New Mersey Crossing are:

- To relieve the Silver Jubilee Bridge (SJB), thereby removing the constraint on local and regional development and better provide for local traffic needs. (The crossing must provide a viable alternative route to the SJB).
- To maximise development opportunities.
- To improve public transport links across the river.
- To encourage the increased use of cycling and walking.

For the new crossing to be successful:

- It must fulfil each of the above objectives.
- It must fit its environment
- It must be economically viable

The success of the scheme will be measured by the benefits it brings to users of the crossing and to the wider community.

7.2 Improvement of Non-Car Borne Travel

It is a key objective of the project that the New Mersey Crossing improves public transport links across the river, and encourages the increased use of cycling and walking.

Forecast demand for traffic crossing the Mersey between Runcorn and Widnes is 114,000 AADT by 2022. Government guidelines require that provision must also be made for public transport plus cycling and walking. For those alternative modes of transport to be meaningful, this requires an attractive provision. In the case of public transport, the provision must permit the establishment of a reliable and efficient service. In the case of walking and cycling, the provision must be convenient and offer user safety. This implies physical access from the centres of Runcorn and Widnes at acceptable distances.

The most attractive corridor for cycling and walking is the route of the SJB. Historically, the centres of leisure, employment and retail have evolved around this route as the primary route for travel.

Consequently, in order to achieve this objective, it will be necessary to provide enhanced public transport, walking and cycling facilities on the SJB. The existing road network and current
facilities for these road users, together with the length of any other route means that the number of walking and cycling journeys across any new route would be negligible.

The two crossings would be viewed as a single transport corridor. On the existing bridge, provision would be made for two lanes of local traffic, and the remaining roadspace would be devoted to pedestrians and cycles.

Strategic traffic, identified as a problem in Halton, would be encouraged through the design of the approaches onto the new crossing. Strategic cross-borough traffic would need to leave the expressway system, pass onto the SJB, and re-enter the strategic road system through a series of tortuous junctions. There would be no time saved by choosing the SJB.

The resulting spare capacity on the SJB would enable buses to be included within the normal carriageways. Segregated bus lanes would not be required as there would be improved reliability resulting from lower traffic flows.

It is therefore an essential requirement of the new crossing, that it transfers enough strategic traffic from the SJB to allow it to be reduced to two lanes of vehicular traffic.

A suggested typical cross section for these facilities on the SJB is shown in Figure 7.1 below:

Figure 7.1 Typical post construction section of the Silver Jubilee Bridge

This concept has evolved over the development of this project – originally, it was thought that the new bridge would carry local traffic and that the SJB would be in place to carry regional traffic.

7.3 Building a Better Future

Halton Borough Council recently produced its corporate plan entitled Building a Better Future. This plan recognises that the Borough has inherited many problems, due in the main to the area’s industrial past.
This plan outlines the processes required to improve quality of life for the residents of Halton against five strategic priorities, as follows:

- Improving health standards
- Promoting urban renewal
- Enhancing life chances and employment
- Tackling poverty and deprivation
- Ensuring safe and attractive neighbourhoods.
8. ASSESSMENT AGAINST NATIONAL AND REGIONAL PLANNING OBJECTIVES

The New Mersey Crossing project meets with the following national and local policy objectives:

8.1 A New Deal for Transport: Better for Everyone

The new crossing falls squarely within the policies outlined in the New Deal for Transport:

- Integration between different modes of transport

By relieving congestion on the Silver Jubilee Bridge (SJB) and providing facilities for public transport, walking and cycling, the culture of multi-modal travel between Runcorn and Widnes is enhanced. The scheme will promote walking and cycling between the communities as a safe and viable alternative to the private car.

- Integration with policies for the environment

The EIA will identify the mitigation works required to ensure no severe detrimental impact to the natural and built environment.

- Integration with land use planning

The New Mersey Crossing is a key inclusion in local and regional planning policy.

- Integration with policies for health

Halton has a very poor health record and the social impact assessment shows that a new crossing is essential to improve the poor health and deprivation experienced in Halton. Due to the lack of facilities provided for cyclists and pedestrians, physical fitness in Halton is low. The crossing will promote alternative forms of travel, thereby improving fitness.

By relieving congestion on the SJB, response times for emergency services will improve.

- Integration with policies for social inclusion

The existing congestion on the SJB provides a barrier to social inclusion by compounding the natural severance between Runcorn and Widnes.

From a brief examination of the social problems in Halton, it is clear that issues of equity, health, social cohesion, support for the disabled and underprivileged, learning and skills, and employment are high on the agenda for Halton. It is important that the new Mersey Crossing has a positive contribution to make to achieve that agenda.

8.2 Transport 2010: The 10-Year Plan

At the core of Halton’s LTP is the provision of the New Mersey Crossing. Travel by all modes throughout the Borough is hindered by the congestion on the SJB.
Facilities on the SJB for cyclists are extremely poor, and the alternative cantilever footway is intimidating to pedestrians. The provision of an efficient public transport system is particularly important in this area given the low car ownership rates.

The New Mersey Crossing will relieve many of these difficulties by improving facilities for the non-motorised modes of travel. It will also relieve congestion allowing travel by bus, or by car for those for whom this represents the only realistic means of travel.

8.3 Our Towns and Cities: The Future - Delivering an Urban Renaissance

Local feeling in Halton is that the communities of Runcorn and Widnes have evolved separately historically and severance is compounded by the single crossing and due to high levels of congestion.

The Halton Borough Council has adopted a positive and inclusive approach in the promotion of the New Mersey Crossing. Local landowners, businesses, neighbouring authorities and residents have been engaged in a massive consultation process to ensure public support in the New Mersey Crossing project that will promote the urban renaissance so desperately needed in the area.

As the White Paper itself states:

"This urban renaissance will benefit everyone, making towns and cities vibrant and successful, and protecting the countryside from development pressure."

8.4 Regional Planning Guidance for the North West

The RPG for the North West covers Cheshire, Cumbria, Lancashire, Greater Manchester and Merseyside (including the unitary authorities of Blackburn with Darwen, Blackpool, Halton and Warrington).

The New Mersey Crossing is a requirement of policy T10 of the RPG.

8.5 North West Development Agency

The New Mersey Crossing is a major factor in the strategy of the NWDA.

The Mersey Belt Study states:

“... it is clear that additional river crossing capacity at or near Runcorn would significantly improve the connection between the Southern Crescent, Speke Garston and Liverpool City Centre. It was identified as a problem in the Regional Strategy and is a priority in the North West’s Regional Transport Priorities report.”

The North West’s Strategic Transport Priorities document requires:

“...by 2010 implement an agreed integrated access plan shifting the emphasis toward public transport, including solutions to the Mersey crossing issue at Runcorn”
8.6 Halton Borough Council Unitary Development Plan

The New Crossing of the Mersey is one of Halton’s Strategic Policies included in the UDP. Policy S14 states:

“A scheme for a new crossing of the River Mersey, east of the Silver Jubilee Bridge will be promoted to relieve congestion on the existing bridge as part of an integrated transport system for Halton and the wider transport network.”

8.7 Halton Borough Council Local Transport Plan

The Silver Jubilee Bridge Complex presents a unique challenge to the Council in maintaining a highway structure of such magnitude that carries over 80,000 vehicles each weekday. The SJB has been acknowledged to have regional economic importance but the limit on capacity constrains economic growth and regeneration the sub-region and in the Borough. It also creates a barrier to the development of community interaction between Runcorn and Widnes.

The LTP recognises that a new crossing of the Mersey is needed to enable fully integrated solutions to be pursued. Good public transport links over the Mersey are necessary and whilst bus lanes are being provided on the approaches to the SJB, the bridge itself has substandard lane widths and an additional bridge is needed.

A new bridge crossing of the Mersey could provide enhanced reliability for buses, dedicated facilities for pedestrians and a focal crossing point for primarily sub-regional and strategic traffic movements. This would provide relief for the existing SJB, which could then carry local traffic.

8.8 Code of Practice on Access and Mobility

The Code of Practice was originally compiled and produced by MerseyTravel and the five Merseyside Metropolitan Councils of Knowsley, Liverpool, St. Helens, Sefton and Wirral in February 1999 and was subsequently updated in 2001 and 2002.

The Code of Practice seeks to ensure that special consideration is given to ensure ease of access and movement for disabled people between and within public areas by the careful provision, siting and design of parking areas, paths, dropped kerbs, pedestrian crossings, street furniture and open space.

These criteria will be taken into account in the detailed design criteria of the new crossing.

8.9 Neighbouring Boroughs

The local councils of Knowsley, Liverpool, Sefton, St.Helens and Wirral, in partnership with MerseyTravel, submitted their 5-year Local Transport Plan for Merseyside in July 2000.

The Regional Strategy Proposals include “Pressing for action to improve access to the Mersey Crossing at Runcorn and Liverpool Docks and City Centre from the M62 (including any necessary capacity improvements to Junction 6).”
8.10 Liverpool Airport

The Liverpool Airport Surface Access strategy states:

“The Airport Company supports the proposal for an additional crossing at Runcorn and recognises the need for improved public transport links to and from the airport using this corridor.”

8.11 Liverpool City of Culture 2008

On 4th June 2003, the Culture Secretary, Tessa Jowell, announced that Liverpool had been chosen as the European City of Culture for 2008.

The successful bid will have a dramatic impact on the city and will bring a positive shift in the national and international profile of the city.

A year long programme of cultural and community based festivals and events will be held in 2008, extending and broadening existing plans to celebrate the city's 800th birthday in 2007.

The award will bring about a £35 million investment in the city's cultural offer as well as permanent and world-class new cultural features worth at least £380 million.

Glasgow was the last British City to be European Capital of Culture in 1990. Glasgow saw the creation of thousands of jobs and more than £1bn worth of public and private investment.

The new crossing will allow communication links to be greatly improved to Liverpool, particularly from the European mainland.
9. ROUTE OPTIONS OVERVIEW

Figure 9.1 below illustrates the routes under consideration for the proposed New Mersey Crossing:

Each of these routes is considered in detail in the following sections.

Initially, a brief overview of the route under consideration is made. Further information on these routes can be found in the various technical reports accompanying this appraisal.

It should be noted that in each of the routes, the span is limited to 500 metres. Spans in excess of this would result in tower heights that would conflict with air traffic at the nearby Liverpool John Lennon Airport.

The routes are then considered against the scheme objectives and other selection criteria in determining which to take forward for NATA assessment.

9.1 Route 1 - Route Overview

Route 1 occupies the historical transportation corridor across the Mersey at the Runcorn Gap. This natural narrowing of the estuary provides the shortest physical crossing within the study area and is superficially the most obvious choice for a new crossing.
Existing structures occupy the site. The first, built in 1868, is the viaduct that carries the main railway line between London and Liverpool. This structure has intermediate piers within the navigable waterway.

In 1905, a vehicular/passenger Transporter bridge was built between Runcorn and Widnes. This crossed the river and, what was then, the recently opened Manchester Ship Canal in a single span. The limited capacity provided by the single gondola was soon shown to be inadequate and, from 1956 to 1961, the new arch bridge was built to carry a single 2-lane carriageway. Within 10 years, this too was recognised as providing an inadequate capacity and the deck was widened to permit 4 narrow lanes. It was renamed the Silver Jubilee Bridge in 1977.

At that time, it was envisaged that an additional bridge could be installed between the SJB and the railway bridge.

The proximity of the new crossing to the Silver Jubilee Bridge and the Railway Bridge, both of which are listed structures, also means that interaction between the new bridge and the SJB needs to be considered carefully, particularly with respect to visual impact.

The area adjacent to this route corridor is heavily urbanised with a high proportion of residential properties and is close to the urban centres of Runcorn and Widnes. The construction of a new crossing in this area would cause significant disruption to local residents and businesses.

At the Western Point Expressway Interchange, a further 6 viaducts will be needed and a 5m high retaining wall; at the Speke Road interchange, two viaducts and two bridges will be required.

**Operation of the New Crossing with the Silver Jubilee Bridge**

The constriction at the Runcorn Gap (exacerbated by the introduction of the Manchester Ship Canal) has a significant effect on the tidal regime. This results in extreme tidal currents in excess of 2m/sec through the gap. Any marine operation necessary for the construction of a new bridge will be operating in extremely dangerous conditions. The risk to the existing structures from such an activity is obvious and effectively rules out anything other than a clear span structure with a span of approximately 400 metres. Structural choices in such circumstances are limited.

Traffic figures indicate that the combined provision on the SJB and the new crossing needs to be equivalent to a dual 3-lane highway. To this must be added a provision for cycling and walking plus the facilitation of a public transport connection with the local network in Runcorn and Widnes. The SJB could be modified to provide 3 lanes of traffic and could form either the north or southbound carriageway of a combined crossing. However, this leaves the new bridge having to accommodate the other 3 lanes together with public transport, cyclists, etc. There must also be the ability of diverting at least 2 lanes of traffic between the bridges for essential maintenance (particularly relevant for the high maintenance demand of SJB). As an absolute minimum, it is suggested that the new bridge should have a deck width of 16 metres (3 lanes, hard shoulder, and footway/cycleway).

The possibility of constructing a new crossing between the SJB and the railway bridge has been suggested in the past, however the narrow distance between the two existing bridges makes construction of such a bridge extraordinarily difficult. Add the requirement to maintain traffic throughout the construction period (approximately 3 years) and the likely aerodynamic...
interference on the developing structure resulting from the adjacent structure and we cannot avoid the conclusion that the possibility of a new bridge between the Railway Bridge and SJB does not realistically exist. However, a bridge immediately upstream of SJB is possible and the most economic structure will be a cable-stayed bridge.

Operating the two bridges together to adequately serve both local and through traffic presents its own difficulties. The demands of each are different. The predicted traffic flows require modification of the links with the highway network. It has become apparent that there are significant advantages to dedicating SJB to public transport and local traffic and to arrange for the new bridge to take all the through traffic. The additional structural cost of the bridge will be offset by the simplification of the arrangement of the bridge approaches.

9.2 Route 2 - Route Overview

Route 2 is approximately a kilometre upstream from the SJB. It starts on the south side of the river at the junction between Astmoor Lane and the Bridgewater Expressway, crosses the ship canal and the edges of the salt marshes before crossing the estuary. On the north bank, it crosses the salt marshes, St. Helens Canal and railway line before joining Ashley Way to the west of Rhodia.

The approach spans for each option will be the same type of construction as the short span option, thus providing a continuous viaduct in each case. Spans will be chosen to suit the tie in with the main river structure, the ship canal crossing and the position of the structures at the Astmoor Interchange.

Works at Astmoor Interchange will carry a requirement for 3 bridges and 5 retaining walls; Speke Road Interchange will require 6 bridges and 2 retaining walls.

9.3 Route 2A - Route Overview

Route 2A is approximately 1.25 km upstream from the SJB. It starts on the south side of the river at the junction between Astmoor Lane and the Bridgewater Expressway, crosses the ship canal and the edges of the salt marshes before crossing the estuary. On the north bank, it crosses the salt marshes, St. Helens Canal and railway line before joining Ashley Way to the east of Rhodia at Bowers Business Park Roundabout. The Runcorn terminal junction at Astmoor and the Widnes terminal junction at Widnes will be as defined in Routes 2 and 3 respectively.

As with Route 2, there are a number of structure options with this route: short spans and medium spans. The approach spans for each option will be the same type of construction as the short span option, thus providing a continuous viaduct in each case. Spans will be chosen to suit the tie in with the main river structure, the ship canal crossing and the position of the structures at the Astmoor Interchange.

Works at Astmoor Interchange will carry a requirement for 3 bridges and 5 retaining walls; The Bowers Roundabout will require 2 new retaining walls.
9.4 Route 3 - Route Overview

Route 3 is approximately 1.8 km upstream from the SJB. It starts on the south side of the river at the junction of the Daresbury, Bridgewater and Central Expressways, crosses Astmoor Industrial Estate, the ship canal and the edges of the salt marshes before crossing the estuary. On the north bank, it crosses the salt marshes, St. Helens Canal and railway line before joining Ashley Way to the east of Rhodia.

At present, there is no proposal for grade separation of the junction on the north bank. This is unlikely to prove effective. Grade separation should probably be included with this proposal, although this has significant cost implications.

9.5 Route 3A - Route Overview

Route 3A is approximately 1.6 km upstream from the SJB. It starts on the south side of the river at the junction of the Daresbury and Central Expressways, crosses Astmoor Industrial Estate, the ship canal and the edges of the salt marshes before crossing the estuary. On the north bank, it crosses the salt marshes, St. Helens Canal and railway line before joining Ashley Way to the west of Rhodia.

9.6 Route 4 - Route Overview

Route 4 is approximately 4.5 km upstream of the SJB. It starts from Daresbury Expressway at Manor Park and heads northwards to the river crossing at Fiddlers Ferry. Once across the river it skirts the edge of the power station lagoons on embankment before crossing the salt marshes, St. Helens canal and the railway line on a separate structure and joining Fiddlers Ferry Road west of the power station.

Route 4 is considered to favour sub-regional traffic and likely to demonstrate additional benefits to St Helens and Warrington, although it is still considered to increase local accessibility.

9.7 Tunnel - Route Overview

The tunnel option, to the west of the SJB would be likely to be bored so not to unnecessarily disturb the SPA. The route connects the A557 near Weston Point, travels beneath the River Mersey and thence Pickering’s Pasture, rising clear of that area, and connecting to the grade-separated interchange on the A562.

9.8 Route Assessment

In the following tables, we have considered whether the routes and spans described above should be taken forward for further detailed consideration using the NATA methodology.

In table 4, we consider whether the route under consideration meets the scheme objectives. If these criteria - outlined in Section 9 above - are not met, then the scheme would not be progressed even if funding were available.

In table 5, we take this assessment and consider it alongside other “high-level” issues, such as construction impacts, main environmental concerns and cost. These criteria do not fit well within
the AST and so are used as a selection tool for which routes should be taken forward for detailed appraisal.
<table>
<thead>
<tr>
<th>Route</th>
<th>Main Span Options</th>
<th>Main Span Length</th>
<th>Relieve Silver Jubilee Bridge</th>
<th>Maximise Development Opportunities</th>
<th>Improve Public Transport&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Encourage Cycling and Walking</th>
<th>Does Route Meet Scheme Objectives?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 1</td>
<td>Multi-span</td>
<td>200m</td>
<td>The provision of a new bridge upstream of SJB works well and fully satisfies the criteria of increased capacity and facilitating public transport and cycling and walking.</td>
<td>Congestion relief will improve access to existing areas of development but access to new areas is not provided.</td>
<td>Public transport would be able to use either bridge with priority lanes up to some junctions but not with priority lanes on the crossings. Congestion relief will improve existing public transport provision.</td>
<td>Cycling and pedestrian facilities on the SJB will be improved</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Cable-stayed</td>
<td>435m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Route 2</td>
<td>Short Spans (Viaduct)</td>
<td>100m</td>
<td>The traffic modelling exercise shows that approximately 38% of traffic was attracted to the existing SJB, and 62% of crossing traffic went towards the New Mersey Crossing. This route demonstrates the potential to reduce the SJB to two lanes.</td>
<td>Congestion relief will improve access to existing areas of development and access to Astmoo and southeast Widnes is improved.</td>
<td>Public transport would be able to use either bridge with priority lanes up to some junctions but not with priority lanes on the crossings. Congestion relief will improve existing public transport provision and new route allows additional public transport routes to be opened up.</td>
<td>Cycling and pedestrian facilities on the SJB will be improved</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Medium Spans (Cable Stayed)</td>
<td>4x320m</td>
<td>Although the bridge has no greater benefits than Route 2, it attracts significantly less traffic than Route 2 due to the configuration of the junctions and the alignment of the route. It is doubtful whether the shift of strategic traffic would be to such an extent that the SJB could be downgraded to two lanes. Consequently, the objectives of the crossing would not be met and the route should therefore be rejected.</td>
<td>Limited congestion relief would mean that access to development opportunities would be greatly restricted.</td>
<td>Public transport would be able to use either bridge with priority lanes up to some junctions but not with priority lanes on the crossings.</td>
<td>Cycling and pedestrian facilities on the SJB will be improved</td>
<td>No</td>
</tr>
<tr>
<td>Route 2A</td>
<td>Short Spans (Viaduct)</td>
<td>100m</td>
<td>The traffic model shows that existing SJB would attract 26% of traffic, and there would be a diversion of about 74% of traffic with a peak flow of 3769 vehicle per hour unto the new crossing, by the design year (2022). Route 3 demonstrates a good potential to transfer strategic traffic onto the new crossing and is therefore considered to comply with this test.</td>
<td></td>
<td>Public transport would be able to use either bridge with priority lanes up to some junctions but not with priority lanes on the crossings.</td>
<td>Cycling and pedestrian facilities on the SJB will be provided for the new crossing</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Medium Spans (Cable Stayed)</td>
<td>4x320m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Route 3</td>
<td>Short Spans (Viaduct)</td>
<td>100m</td>
<td>The traffic model shows that existing SJB would attract 26% of traffic, and there would be a diversion of about 74% of traffic with a peak flow of 3769 vehicle per hour unto the new crossing, by the design year (2022). Route 3 demonstrates a good potential to transfer strategic traffic onto the new crossing and is therefore considered to comply with this test.</td>
<td>Congestion relief will improve access to existing areas of development and access to Astmoo and south-east Widnes is improved.</td>
<td>Public transport would be able to use either bridge with priority lanes up to some junctions but not with priority lanes on the crossings.</td>
<td>Cycling and pedestrian facilities on the SJB will be provided for the new crossing</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Medium Spans (Cable Stayed)</td>
<td>3x320m</td>
<td>The analysis and modelling of the traffic for this option showed that the existing SJB would attract approximately 21% of traffic, in the design year (2022). Route 3A option, resulted in a significant traffic alleviation on Bridgegewater Expressway, with peak flows in the design year, of less than 1000 vehicles per hour, the equivalent traffic level across Central Expressway unto MS6 was substantial increased, resulting in peak flows of 4065 vehicles per hour.</td>
<td></td>
<td>Public transport would be able to use either bridge with priority lanes up to some junctions but not with priority lanes on the crossings.</td>
<td>Cycling and pedestrian facilities on the SJB will be provided for the new crossing</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Long Spans (Cable Stayed)</td>
<td>2x460m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Route 3A</td>
<td>Short Spans (Viaduct)</td>
<td>100m</td>
<td>The analysis and modelling of the traffic for this option showed that the existing SJB would attract approximately 21% of traffic, in the design year (2022). Route 3A option, resulted in a significant traffic alleviation on Bridgegewater Expressway, with peak flows in the design year, of less than 1000 vehicles per hour, the equivalent traffic level across Central Expressway unto MS6 was substantial increased, resulting in peak flows of 4065 vehicles per hour.</td>
<td></td>
<td>Public transport would be able to use either bridge with priority lanes up to some junctions but not with priority lanes on the crossings.</td>
<td>Cycling and pedestrian facilities on the SJB will be provided for the new crossing</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Medium Spans (Cable Stayed)</td>
<td>3x360m</td>
<td>Route 4 attracted 47% of traffic in the design year, but this figure was found to be much lower at opening, in year 2007. The increase in flow at design year could not, therefore, be attributed to journey-time savings, but as a consequence of increasing congestion on the SJB. It can be seen that the attraction of traffic to the proposed Route 4 would not be of a sufficient level to allow the SJB to be reduced to two lanes. Consequently, this route would not meet the objectives of the new crossing (in reference to Section 8 above) and will not be taken for further appraisal beyond this point.</td>
<td>Minimal congestion relief on SJB will not significantly improve access to existing areas of development but access to east south east Widnes and Manor Park is improved.</td>
<td>Public transport would be able to use either crossing with priority lanes up to some junctions but not with priority lanes on the crossings. Minimal congestion relief on SJB will not significantly improve public transport using the SJB but new route allows additional public transport routes to be opened up.</td>
<td>Cycling and pedestrian facilities on the SJB will not be provided on the new crossing</td>
<td>No</td>
</tr>
<tr>
<td>Route 4</td>
<td>Single Span (Cable Stayed)</td>
<td></td>
<td>The tunnel would attract little traffic from the SJB and would not be of a sufficient level to allow the SJB to be reduced to two lanes. Consequently, this route would not meet the objectives of the new crossing (in reference to Section 8 above) and will not be taken for further appraisal beyond this point.</td>
<td>Minimal congestion relief on SJB will not significantly improve access to existing areas of development but access to Knowsley and Merseyside will not be improved.</td>
<td></td>
<td>Cycling and pedestrian facilities on the SJB will not be provided on the new crossing</td>
<td>No</td>
</tr>
<tr>
<td>Tunnel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do Minimum</td>
<td></td>
<td></td>
<td>0%</td>
<td>No additional development opportunities</td>
<td>No improvement to public transport across the river</td>
<td>No improvement to pedestrian and cycling facilities across the river</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 4 Route assessment against scheme objectives

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Appendix 1

Major Scheme Appraisal for the New Mersey Crossing

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Gifford and Partners

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<table>
<thead>
<tr>
<th>Route</th>
<th>Main Span Options</th>
<th>Main Span Length</th>
<th>Does Route Meet Scheme Objectives?</th>
<th>Construction Issues</th>
<th>Main Environmental Concerns</th>
<th>Estimated Cost (*) and BCR</th>
<th>NPV</th>
<th>Scheme Taken Forward to AST?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 1</td>
<td>Multi-span</td>
<td>200m</td>
<td>Yes</td>
<td></td>
<td>Impact on residents and businesses in Runcorn Old Town and Widnes West Bank are considered to be unacceptable. Visual impact of cable-stayed option on existing listed bridges is considered unacceptable. Impact of multi-span option on hydrodynamics is considered unacceptable.</td>
<td>Cost: £235m BCR: 5.305</td>
<td>£1,011m</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Cable-stayed</td>
<td>435m</td>
<td></td>
<td></td>
<td></td>
<td>Cost: £295m BCR: 4.214</td>
<td>£950m</td>
<td>Yes</td>
</tr>
<tr>
<td>Route 2</td>
<td>Short Spans (Viaduct)</td>
<td>100m</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Cost: £291m BCR: 4.341</td>
<td>£973m</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Medium Spans (Cable Stayed)</td>
<td>4x320m</td>
<td></td>
<td></td>
<td></td>
<td>Cost: £344m BCR: 3.675</td>
<td>£921m</td>
<td>Yes</td>
</tr>
<tr>
<td>Route 2A</td>
<td>Short Spans (Viaduct)</td>
<td>100m</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Medium Spans (Cable Stayed)</td>
<td>4x320m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Route 3</td>
<td>Short Spans (Viaduct)</td>
<td>100m</td>
<td>Yes</td>
<td></td>
<td>Measures to minimise impact on saltmarsh and intertidal habitats and birds will need to be taken. Short spans have greater impact on hydrodynamics. There are no significant environmental impacts that could not be mitigated</td>
<td>Cost: £316m BCR: 4.315</td>
<td>£1,045m</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Medium Spans (Cable Stayed)</td>
<td>3x320m</td>
<td></td>
<td></td>
<td></td>
<td>Cost: £359m BCR: 3.783</td>
<td>£1,002m</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Long Spans (Cable Stayed)</td>
<td>2x460m</td>
<td></td>
<td></td>
<td></td>
<td>Cost: £368m BCR: 3.719</td>
<td>£995m</td>
<td>Yes</td>
</tr>
<tr>
<td>Route 3A</td>
<td>Short Spans (Viaduct)</td>
<td>100m</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Cost: £344m BCR: 3.837</td>
<td>£975m</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Medium Spans (Cable Stayed)</td>
<td>3x360m</td>
<td></td>
<td></td>
<td></td>
<td>Cost: £400m BCR: 3.298</td>
<td>£916m</td>
<td>Yes</td>
</tr>
<tr>
<td>Route 4</td>
<td>Single Span (Cable Stayed)</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td>Cost: £274m BCR: 3.301</td>
<td>£903m</td>
<td>No</td>
</tr>
<tr>
<td>Tunnel</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cost: £335</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Do Minimum</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cost: £12m</td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

Table 5 Route assessment against selection criteria

(*) Cost includes upper limit optimism bias for non-standard projects at 66%.
10. **ASSESSMENT AGAINST CENTRAL GOVERNMENT OBJECTIVES**

Appraisal Summary Tables are provided for the following options. AST worksheets are provided in Volume 2 of this Major Scheme Appraisal.

<table>
<thead>
<tr>
<th>Route</th>
<th>Span Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 1</td>
<td>Single Span</td>
</tr>
<tr>
<td>Route 2</td>
<td>Short Spans</td>
</tr>
<tr>
<td>Route 2</td>
<td>Medium Spans</td>
</tr>
<tr>
<td>Route 3</td>
<td>Short Spans</td>
</tr>
<tr>
<td>Route 3</td>
<td>Medium Spans</td>
</tr>
<tr>
<td>Route 3</td>
<td>Long Spans</td>
</tr>
<tr>
<td>Route 3A</td>
<td>Short Spans</td>
</tr>
<tr>
<td>Route 3A</td>
<td>Medium Spans</td>
</tr>
</tbody>
</table>
## 10.1 Route 1 Single Span

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Problems</th>
<th>Present Value Costs to Public Accounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 1 Cable Stayed Bridge</td>
<td>New single-span crossing alongside the existing SJB. The new crossing will work in tandem with the SJB to carry both strategic and local traffic.</td>
<td>SJB acts as a control to the road network capacity.</td>
<td>£2,295.7m</td>
</tr>
</tbody>
</table>

### Objective

<table>
<thead>
<tr>
<th>Objective</th>
<th>Sub-Objective</th>
<th>Qualitative Impacts</th>
<th>Quantitative Measure</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>Noise</td>
<td>Route 1 would result in 10 additional people being annoyed in the future compared to do minimum in the future.</td>
<td>Do-Minimum 3232</td>
<td>Do-something (2022) 3242</td>
</tr>
<tr>
<td></td>
<td>Local Air Quality</td>
<td>The proposal does not lead to an increase in PM10 levels by over 2mg/m³ or NOx levels by over 4µg/m³. The proposal does not exceed the AGS NOx objective of 40µg/m³.</td>
<td>NO2: 43.634 PM10 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Greenhouse Gases</td>
<td>The do something scenario will have a positive impact as it reduces carbon dioxide emissions when compared to the do nothing scenario, it will therefore go towards achieving national targets.Rail emissions not taken into account.</td>
<td>2,792.6 tonnes of CO2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Landscape</td>
<td>Route of new crossing has a negligible effect on landscape.</td>
<td>NEUTRAL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Townscape</td>
<td>Effects on locally distinctive settlements of West Bank Widnes and Runcorn Old Town which have developed to North and South Banks of Runcorn Gap Crossing / bridging point and new form part of setting of Grade II * Listed SJB.</td>
<td>LARGE ADVERSE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heritage of Historic Resources</td>
<td>Substantial effect on setting and visual impact of a landmark feature that cannot be mitigated</td>
<td>LARGE ADVERSE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biodiversity</td>
<td>Incorporation of statutory requirements (EA/EN) to mitigate potential impact on ecology of the Mersey Estuary including sensitive procedures at the construction stage recognising seasonal constraints.</td>
<td>Construction: LARGE ADVERSE Operation: SLIGHT ADVERSE Decommissioning: LARGE ADVERSE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water Environment</td>
<td>The Mersey Estuary and Manchester Ship Canal in particular are well known national features. The Mersey is of a local scale with a high rarity; the Ship Canal is of regional scale with a moderate rarity. The aquifer is local but with high rarity and cannot be re-created.</td>
<td>SLIGHT ADVERSE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Physical Fitness</td>
<td>The New Crossing will increase walking and cycling for approximately 2400 people. This will be predominantly home to work shopping trips. As a result, physical fitness in excess of 30 minutes is low, but below 30 minutes is very high.</td>
<td>Pedestrians + 87 Cyclists + 10 Score +97</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Journey Ambience</td>
<td>Significant reductions in traveller stress and improvements in traveller views</td>
<td>LARGE BENEFICIAL</td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>Accidents</td>
<td>The new crossing will result in a small decrease in serious and slight accidents.</td>
<td>Reduction in annual accidents: Fatal: 0 Serious: 2 Slight: 8</td>
<td>PVB £11.1m</td>
</tr>
<tr>
<td></td>
<td>Security</td>
<td>Security for all road users will increase (especially with the introduction of CCTV), also benefits for households, pedestrians and public transport users.</td>
<td>Moderate Beneficial</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Public Accounts</td>
<td>The crossing will provide relief, allowing traffic to flow more freely. The benefits shown are generated primarily by the relief of the delay, rather than by providing alternative route choices. The traffic figures are based on a variable demand, providing some measure of both suppressed and released induced traffic within the analysis. Analysis results in a Net Present Value of £1246m and a Benefit to Cost Ratio (BCR) of 4.214 over the appraisal period 2007 to 2036 (discounted to 1998 prices).</td>
<td>Central Govt PVC £295.7m Local Govt PVC £0</td>
<td>PVC £295.7m</td>
</tr>
<tr>
<td></td>
<td>Business Users &amp; Providers</td>
<td>Business Users PVB £580.6m Private Sector Providers PVC £0 Other PVC £0</td>
<td>Business Users PVB £580.6m</td>
<td>PVC £295.7m</td>
</tr>
<tr>
<td></td>
<td>Consumer Users</td>
<td>Consumer Users PVB £665.4m</td>
<td>Consumer Users PVB £665.4m</td>
<td>PVC £295.7m</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>A stress based approach considers stress as the ratio of daily traffic to the congestion reference flow. Impact is the change in stress x daily flow (AADT).</td>
<td>Large Beneficial</td>
<td>Score 8,507,000</td>
</tr>
<tr>
<td></td>
<td>Wider Economic Impacts</td>
<td>The NMC is expected to contribute significantly to the growth of the wider NW economy and to regeneration of the Mersey Belt Priority Area through enhancement of the image of the area, increased attractiveness to inward investment, and strengthening and deepening of the economic base of the area.</td>
<td>£5,930m new/rehab commercial floorspace; 5% house price increase; 3,350 additional jobs; 1,600 person/years construction jobs; £56m per annum additional value added; £90m increase in commercial property value; £73m increase in gross development value; 1.4% improvement in unemployment rates; 1.5% increase in town centre turnover</td>
<td>YES</td>
</tr>
<tr>
<td>Accessiblity</td>
<td>Option values</td>
<td>The crossing will provide value to more than 100,000 residents and workers in Halton</td>
<td></td>
<td>LARGE BENEFICIAL</td>
</tr>
<tr>
<td></td>
<td>Severance</td>
<td>All routes subject to increased traffic flows are provided with existing grade separated crossings.</td>
<td></td>
<td>LARGE BENEFICIAL</td>
</tr>
<tr>
<td></td>
<td>Access to the Transport System</td>
<td>Most properties in Halton are within 250m of a daily hourly bus service. The new crossing will have no impact.</td>
<td></td>
<td>NEUTRAL</td>
</tr>
<tr>
<td></td>
<td>Integration</td>
<td>Transport Interchange</td>
<td>Unpredictable journey time can lead to missed connections to public transport facilities, Liverpool John Lennon Airport and Manchester Airport.</td>
<td>Passenger Interchange SLIGHT BENEFICIAL Freight Interchange SLIGHT BENEFICIAL</td>
</tr>
<tr>
<td></td>
<td>Land-Use Policy</td>
<td>Complies fully with many national, regional and local land use and planning policies.</td>
<td></td>
<td>LARGE BENEFICIAL</td>
</tr>
<tr>
<td></td>
<td>Other Government Policies</td>
<td>Complies with policies of DEFFRA, Cabinet Office, DCMS, DfIE, DIT, FCO, DoH, Home Office, DWP, Treasury</td>
<td></td>
<td>MODERATE BENEFICIAL</td>
</tr>
</tbody>
</table>
### 10.2 Route 2 Short Spans

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Problems</th>
<th>Present Value Costs to Public Accounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 2 Short Span Bridge</td>
<td>New crossing 1km upstream of the SJH, intended to carry strategic traffic only, leaving the SJH to carry local traffic.</td>
<td>SJH acts as a control to the road network capacity.</td>
<td>£291.3m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OBJECTIVE</th>
<th>SUB-OBJECTIVE</th>
<th>QUALITATIVE IMPACTS</th>
<th>QUANTITATIVE MEASURE</th>
<th>ASSESSMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVIRONMENT</td>
<td>Noise</td>
<td>Route 2 results in an additional 20 people being annoyed with most of them being in the higher noise exposure categories.</td>
<td>Do-Minimum 3232</td>
<td>Slight - Moderate Adverse</td>
</tr>
<tr>
<td>Local Air Quality</td>
<td>The proposal does not lead to an increase in PM10 levels by over 20ng/m3 or NOx levels by over 40ng/m3. The proposal does not exceed the AQIS NO2 objective of 40mg/m3.</td>
<td>Do-something (2022) 3252</td>
<td>Net Population affected -20</td>
<td></td>
</tr>
<tr>
<td>Greenhouse Gases</td>
<td>The do something scenario will have a positive impact as it reduces carbon dioxide emissions when compared to the do nothing scenario, it will therefore go towards achieving national targets. Rail emissions not taken into account.</td>
<td>Total of 103 properties are likely to be affected.</td>
<td>-1130.2 tonnes of CO2</td>
<td></td>
</tr>
<tr>
<td>Landscape</td>
<td>Effects on distinctive estuary landscape of local/sub-regional importance and its developed, sometimes degraded margins.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Townscape</td>
<td>Route of new crossing has a negligible effect on townscape.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heritage of Historic Resources</td>
<td>Moderate effect on setting and visual impact of a landmark feature that cannot be mitigated. Given greater ground disturbance within estuary there is a higher potential for uncovering previously undiscovered remains of heritage interest.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biodiversity</td>
<td>Incorporation of statutory requirements (EA/EN) to mitigate potential impact on ecology of the Mersey Estuary including sensitive procedures at the construction stage recognising seasonal constraints.</td>
<td>Construction: LARGE ADVERSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Environment</td>
<td>The Mersey Estuary and Manchester Ship Canal in particular are well known national features. The Mersey is of a local scale with a high rarity; the Ship Canal is of regional scale with a moderate rarity. The aquifer is local but with high rarity and cannot be re-created.</td>
<td>Operation: LARGE ADVERSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Fitness</td>
<td>The New Crossing will increase walking and cycling for approximately 2000 people. This will be predominantly home to work shopping trips. As a result, physical fitness in excess of 30 minutes is low, but below 30 minutes is very high.</td>
<td>Pedestrians + 37 Cyclists + 10</td>
<td>Score +97</td>
<td></td>
</tr>
<tr>
<td>Journey Ambience</td>
<td>Benefits in Traveler views and environment are offset by a potential deterioration caused by an excess of information at the terminal junctions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAFETY</td>
<td>Accidents</td>
<td>The new crossing will result in a small decrease in serious and slight accidents.</td>
<td>Reduction in annual accidents: Fatal: 0 Serious: 1 Slight: 8</td>
<td>PVB £8.0m</td>
</tr>
<tr>
<td>Security</td>
<td>Security for all road users will increase (especially with the introduction of CCTV), also benefits for households, pedestrians and public transport users.</td>
<td>PVB £629.3m</td>
<td>Moderate Beneficial</td>
<td></td>
</tr>
<tr>
<td>ECONOMY</td>
<td>Public Accounts</td>
<td>The crossing will provide relief, allowing traffic to flow more freely. The benefits shown are generated primarily by the relief of the delay, rather than by providing alternative route choices. The traffic figures are based on a variable demand, providing some measure of both suppressed and released induced traffic within the analysis. Analysis results in a Net Present Value of £373m and a Benefit to Cost Ratio (BCR) of 4.341 over the appraisal period 2007 to 2036 (discounted to 1998 prices).</td>
<td>Central Govt PVC -£291.3m</td>
<td></td>
</tr>
<tr>
<td>Business Users &amp; Providers</td>
<td>Central Govt PVC -£291.3m</td>
<td>PVB £629.3m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumer Users</td>
<td>Business Users PVB £682.4m Private Sector Providers PVB £0</td>
<td>PVB £682.4m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td>Reliability: A stress based approach considers stress as the ratio of daily traffic to the congestion reference flow. Impact is the change in stress x daily flow (AADT). Benefits are as follows: 56,930m2 new/refurb commercial floorspace; 5% house price increase; 3,350 additional jobs; 1,600 person/years construction jobs; £55m per annum additional value added; £200k increase in commercial property value; £75m increase in gross development value; 1.4% improvement in unemployment rates; 1.5% increase in town centre turnover.</td>
<td>Large Beneficial</td>
<td>Score 3,546,000</td>
<td></td>
</tr>
<tr>
<td>Wider Economic Impacts</td>
<td>The NMC is expected to contribute significantly to the growth of the wider NW economy and to regeneration of the Mersey Belt Priority Area through enhancement of the image of the area, increased attractiveness to inward investment, and strengthening and deepening of the economic base of the area.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCESSIBILITY</td>
<td>Option values</td>
<td>The crossing will provide value to more than 100,000 residents and workers in Halton</td>
<td>LARGE BENEFICIAL</td>
<td></td>
</tr>
<tr>
<td>Severance</td>
<td>All routes subject to increased traffic flows are provided with existing grade separated crossings.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to the Transport System</td>
<td>Most properties in Halton are within 250m of a daily hourly bus service. The new crossing will have no impact.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTEGRATION</td>
<td>Transport Interchange</td>
<td>Unpredictable journey time can lead to missed connections to public transport facilities, Liverpool John Lennon Airport and Manchester Airport. Freight connections at docks can be missed</td>
<td>Passenger Interchange: SLIGHT BENEFICIAL Freight Interchange SLIGHT BENEFICIAL</td>
<td></td>
</tr>
<tr>
<td>Land-Use Policy</td>
<td>Complies fully with many national, regional and local land use and planning policies.</td>
<td></td>
<td>LARGE BENEFICIAL</td>
<td></td>
</tr>
<tr>
<td>Other Government Policies</td>
<td>Complies with policies of DEFFRA, Cabinet Office, DCMS, DfE, DIT, FCO, DoH, Home Office, DWP, Treasury</td>
<td></td>
<td>MODERATE BENEFICIAL</td>
<td></td>
</tr>
</tbody>
</table>
### 10.3 Route 2 Medium Spans

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Problems</th>
<th>Present Value Costs to Public Accounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 2 Medium Span Bridge</td>
<td>New crossing 1km upstream of the SJB, intended to carry strategic traffic only, leaving the SJB to carry local traffic.</td>
<td>SJB acts as a control to the road network capacity.</td>
<td>£3,441,0m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>OBJECTIVE</strong></th>
<th><strong>SUB-OBJECTIVE</strong></th>
<th><strong>QUALITATIVE IMPACTS</strong></th>
<th><strong>QUANTITATIVE MEASURE</strong></th>
<th><strong>ASSESSMENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENVIRONMENT</strong></td>
<td><strong>Noise</strong></td>
<td>Route 2 results in an additional 20 people being annoyed with most of them being in the higher noise exposure categories.</td>
<td>Do-Minimum 3232</td>
<td>Net Population affected +20</td>
</tr>
<tr>
<td></td>
<td><strong>Local Air Quality</strong></td>
<td>The proposal does not lead to an increase in PM10 levels by over 20mg/m³ or NO2 levels by over 40mg/m³. The proposal does not exceed the AQS NO2 objective of 40mg/m³.</td>
<td>A total of 1033 properties are likely to be affected.</td>
<td>NO2 - 119.705 PM10 0</td>
</tr>
<tr>
<td></td>
<td><strong>Greenhouse Gases</strong></td>
<td>The do something scenario will have a positive impact as it reduces carbon dioxide emissions when compared to the do nothing scenario, it will therefore go towards achieving national targets. Rail emissions not taken into consideration.</td>
<td>-1130.2 tonnes of CO2</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Landscape</strong></td>
<td>Effects on distinctive estuary landscape of local / sub-regional importance and its developed, sometimes degraded, margins.</td>
<td>Slight - Moderate Adverse</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Townscape</strong></td>
<td>Route of new crossing has a negligible effect on townscape.</td>
<td>Neutral</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Heritage of Historic Resources</strong></td>
<td>Moderate effect on setting and visual impact of a landmark feature that cannot be mitigated.</td>
<td>Moderate Adverse</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Biodiversity</strong></td>
<td>Incorporation of statutory requirements (EA/EN) to mitigate potential impact on ecology of the Mersey Estuary Including sensitive procedures at the construction stage recognising seasonal constraints.</td>
<td>Construction: Large Adverse Operation: Large Adverse Decommissioning: Large Adverse</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Water Environment</strong></td>
<td>The Mersey Estuary and Manchester Ship Canal in particular are well known national features. The Mersey is of a local scale with a high rarity, the Ship Canal is of regional scale with a moderate rarity. The aquifer is local but with high rarity and cannot be re-created.</td>
<td>Large Beneficial</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Physical Fitness</strong></td>
<td>The New Crossing will increase walking and cycling for approximately 2400 people. This will be predominantly home to work shopping trips. As a result, physical fitness in excess of 30 minutes is low, but below 30 minutes is very high.</td>
<td>Slight - Moderate Adverse</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Journey Ambience</strong></td>
<td>Benefits in traveler views and environment are offset by a potential deterioration caused by an excess of information at the terminal junctions.</td>
<td>Neutral</td>
<td></td>
</tr>
<tr>
<td><strong>SAFETY</strong></td>
<td><strong>Accidents</strong></td>
<td>The new crossing will result in a small decrease in serious and slight accidents.</td>
<td>Reduction in annual accidents: Fatal: 0 Serious: 1 Slight: 6</td>
<td>PVB £8.0m</td>
</tr>
<tr>
<td></td>
<td><strong>Security</strong></td>
<td>Security for all road users will increase (especially with the introduction of CCTV), also benefits for households, pedestrians and public transport users.</td>
<td>Moderate Beneficial</td>
<td></td>
</tr>
<tr>
<td><strong>ECONOMY</strong></td>
<td><strong>Public Accounts</strong></td>
<td>The crossing will provide relief, allowing traffic to flow more freely. The benefits shown are generated primarily by the relief of the delay, rather than by providing alternative route choices. The traffic figures are based on a variable demand, providing some measure of both suppressed and released reduced traffic within the analysis. Analysis results in a Net Present Value of £921m and a Benefit to Cost Ratio (BCR) of 3.875 over the appraisal period 2007 to 2036 (discounted to 1998 prices).</td>
<td>Central Govt PVC £344.1m Local Govt PVC £0</td>
<td>PVC £344.1m</td>
</tr>
<tr>
<td></td>
<td><strong>Business Users &amp; Providers</strong></td>
<td>The crossing will provide relief, allowing traffic to flow more freely. The benefits shown are generated primarily by the relief of the delay, rather than by providing alternative route choices. The traffic figures are based on a variable demand, providing some measure of both suppressed and released reduced traffic within the analysis. Analysis results in a Net Present Value of £921m and a Benefit to Cost Ratio (BCR) of 3.875 over the appraisal period 2007 to 2036 (discounted to 1998 prices).</td>
<td>Business Users PVB £892.3m Private Sector Providers PVB £0 Other PVB £0</td>
<td>PVB £892.3m</td>
</tr>
<tr>
<td></td>
<td><strong>Consumer Users</strong></td>
<td>The crossing will provide relief, allowing traffic to flow more freely. The benefits shown are generated primarily by the relief of the delay, rather than by providing alternative route choices. The traffic figures are based on a variable demand, providing some measure of both suppressed and released reduced traffic within the analysis. Analysis results in a Net Present Value of £921m and a Benefit to Cost Ratio (BCR) of 3.875 over the appraisal period 2007 to 2036 (discounted to 1998 prices).</td>
<td>Consumer Users PVB £892.4m</td>
<td>PVB £892.4m</td>
</tr>
<tr>
<td></td>
<td><strong>Reliability</strong></td>
<td>A stress based approach considers stress as the ratio of daily traffic to the congestion reference flow. Impact is the change in stress x daily flow (AADT) Large Beneficial</td>
<td>Score 3,546,000</td>
<td></td>
</tr>
<tr>
<td><strong>Wider Economic Impacts</strong></td>
<td><strong>Reliability</strong></td>
<td>The NMC is expected to contribute significantly to the growth of the wider NW economy and to regeneration of the Mersey Bell Priority Area through enhancement of the image of the area, increased attractiveness to inward investment, and strengthening and deepening of the economic base of the area.</td>
<td>£6,950/2 new/1dual commercial floorpace; 5% house price increase; 3,350 additional jobs; 1,600 persons/year construction jobs; £85m per annum additional value added; £90m increase in commercial property value; £73m increase in gross development value; 1.4% improvement in unemployment rates; 1.5% increase in town centre turnover</td>
<td>YES</td>
</tr>
<tr>
<td><strong>ACCESSIBILITY</strong></td>
<td><strong>Option values</strong></td>
<td>The crossing will provide value to more than 100,000 residents and workers in Halton</td>
<td>Large Beneficial</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Severance</strong></td>
<td>The new crossing will result in a small decrease in serious and slight accidents.</td>
<td>Moderate Beneficial</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Access to the Transport System</strong></td>
<td>Most properties in Halton are within 250m of a daily hourly bus service. The new crossing will have no impact.</td>
<td>Neutral</td>
<td></td>
</tr>
<tr>
<td><strong>INTEGRATION</strong></td>
<td><strong>Transport Interchange</strong></td>
<td>Improducible journey time can lead to missed connections to public transport facilities; Liverpool John Lennon Airport and Manchester Airport. Freight connections at docks can be missed</td>
<td>Passenger Interchange: slight beneficial Freight Interchange: slight beneficial</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Land-Use Policy</strong></td>
<td>Complies fully with many national, regional and local land use and planning policies.</td>
<td>Large Beneficial</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Other Government Policies</strong></td>
<td>Complies with policies of DEFRA, Cabinet Office, DCMS, OIEE, DIT, FCO, DoH, Home Office, DWP, Treasury</td>
<td>Moderate Beneficial</td>
<td></td>
</tr>
</tbody>
</table>
### 10.4 Route 3 Short Spans

<table>
<thead>
<tr>
<th><strong>Environment</strong></th>
<th><strong>Objective</strong></th>
<th><strong>Description</strong></th>
<th><strong>Problems</strong></th>
<th><strong>Present Value Costs to Public Accounts</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Noise</strong></td>
<td>Route 3 results in an additional 20 people being annoyed with most of them being in the higher noise exposure categories.</td>
<td>Do-Minimum 3232 Population affected</td>
<td>4,315.3m</td>
<td></td>
</tr>
<tr>
<td><strong>Local Air Quality</strong></td>
<td>The proposal does not lead to an increase in PM10 levels by over 20mg/m3 or NO2 levels by over 40mg/m3. The proposal does not exceed the AQ5 NO2 objective of 40mg/m3.</td>
<td>A total of 1833 properties are likely to be affected.</td>
<td>-1130.2 tonnes of CO2</td>
<td></td>
</tr>
<tr>
<td><strong>Greenhouse Gases</strong></td>
<td>The do something scenario will have a positive impact as it reduces carbon dioxide emissions when compared to the do nothing scenario, it will therefore go towards achieving national targets. Rail emissions not taken into account.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Landscape</strong></td>
<td>Effects on distinctive estuary landscape of local / sub-regional importance and its developed, sometimes degraded margins.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Townscape</strong></td>
<td>Route of new crossing has a negligible effect on townscape</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Heritage of Historic Resources</strong></td>
<td>Slight effect on selling and visual impact of a landmark feature that cannot be mitigated. Given greater weight of bridge and access roads and higher number of piecemeal works within the estuary there is a higher potential of uncovering previously undiscovered remains of heritage interest.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biodiversity</strong></td>
<td>Incorporation of statutory requirements (E8/EN) to mitigate potential impact on ecology of the Mersey Estuary recognising seasonal procedures at the construction stage recognising construction stages.</td>
<td>Construction: LARGE ADVERSE Operation: LARGE ADVERSE Decommissioning: LARGE ADVERSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Water Environment</strong></td>
<td>The Mersey Estuary and Manchester Ship Canal in particular are well known national features. The Mersey is of a local scale with a high rarity; the Ship Canal is of regional scale with a moderate rarity. The aquifer is local but with high rarity and cannot be re-created.</td>
<td></td>
<td>MODERATE ADVERSE</td>
<td></td>
</tr>
<tr>
<td><strong>Physical Fitness</strong></td>
<td>The New Crossing will increase walking and cycling for approximately 2400 people. As a result, physical fitness in excess of 30 minutes is low, but below 30 minutes is very high.</td>
<td>Pedestrians +87 Cyclists +10 Score +97</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Journey Ambience</strong></td>
<td>Benefits in Traveler views and environment are offset by a potential deterioration caused by an excess of information at the terminal junctions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SAFETY</strong></td>
<td>The new crossing will result in a small decrease in serious and slight accidents.</td>
<td>Reduction in annual accidents: Fatal: 0 Serious: 4 Slight: 19</td>
<td>PVB £26.1m</td>
<td></td>
</tr>
<tr>
<td><strong>ECONOMY</strong></td>
<td>Security</td>
<td>Security for all road users will increase (especially with the introduction of CCTV), also benefits for households, pedestrians and public transport users.</td>
<td>MODERATE BENEFICIAL</td>
<td></td>
</tr>
<tr>
<td><strong>Public Accounts</strong></td>
<td>The crossing will provide relief, allowing traffic to flow more freely. The benefits shown are generated primarily by the relief of the delay, rather than by providing alternative route choices. The traffic figures are based on a variable demand, providing some measure of both suppressed and released induced traffic within the analysis. Analysis results in a Net Present Value of £1045m and a Benefit to Cost Ratio (BCR) of 4.315 over the appraisal period 2007 to 2036 (discounted to 1998 prices).</td>
<td>Central Govt PVC £315.3m Local Govt PVC £0</td>
<td>PV £315.3m</td>
<td></td>
</tr>
<tr>
<td><strong>Business Users &amp; Providers</strong></td>
<td>The new crossing will result in a small increase in commercial property value; £731.5m per annum additional valued at 5% house price increase; 3,350 additional jobs; 1,600 person years construction jobs; £86m per annum additional value added; £90m increase in commercial property value; £731.5m</td>
<td>Business Users PVC £629.1m Private Sector Providers PVC £0 Other PVC £0</td>
<td>PV £629.1m</td>
<td></td>
</tr>
<tr>
<td><strong>Consumer Users</strong></td>
<td>Benefits in traveller views and environment are offset by a potential deterioration caused by an excess of information at the terminal junctions.</td>
<td>Consumer Users PVC £731.5m</td>
<td>PV £731.5m</td>
<td></td>
</tr>
<tr>
<td><strong>Reliability</strong></td>
<td>A stress based approach considers stress as the ratio of daily traffic to the congestion reference flow. Impact is the change in stress x daily flow (AADT).</td>
<td></td>
<td>Score 4,719,000</td>
<td></td>
</tr>
<tr>
<td><strong>Wider Economic Impacts</strong></td>
<td>The New Crossing will result in a small increase in commercial property value; £731.5m per annum additional valued at 5% house price increase; 3,350 additional jobs; 1,600 person years construction jobs; £86m per annum additional value added; £90m increase in commercial property value; £731.5m</td>
<td></td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td><strong>ACCESSIBILITY</strong></td>
<td>The crossing will provide value to more than 100,000 residents and workers in Halton</td>
<td>LARGE BENEFICIAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Severance</strong></td>
<td>All routes subject to increased traffic flows are provided with existing grade separated crossings.</td>
<td>NEUTRAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Access to the Transport System</strong></td>
<td>Most properties in Halton are within 250m of a daily hourly bus service. The new crossing will have no impact.</td>
<td>NEUTRAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>INTEGRATION</strong></td>
<td>Unpredictable journey time can lead to missed connections to public transport facilities, Liverpool John Lennon Airport and Manchester Airport. Freight connections at docks can be missed.</td>
<td>Passenger Interchange SLIGHT BENEFICIAL Freight Interchange SLIGHT BENEFICIAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Interchange</strong></td>
<td>freight connections at docks can be missed.</td>
<td>Passenger Interchange SLIGHT BENEFICIAL Freight Interchange SLIGHT BENEFICIAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Land-Use Policy</strong></td>
<td>Complies fully with many national, regional and local land use and planning policies.</td>
<td>LARGE BENEFICIAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other Government Policies</strong></td>
<td>Complies with policies of DEFRA, Cabinet Office, DCMS, DfE, DfT, FCO, DoH, Home Office, DWP, Treasury</td>
<td>MODERATE BENEFICIAL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Objective:

**Sub-Objective:**
- **Route 3 results in an additional 20 people being annoyed with most of them being in the higher noise exposure categories.**

#### Environment

- **Noise**
  - The proposal does not lead to an increase in PM10 levels by over 20 µg/m³ or NO2 levels by over 40 µg/m³. The proposal does not exceed the AQS NO2 objective of 40µg/m³.
  - A total of 1033 properties are likely to be affected.
  - **ASSESSMENT:** Do-Minimum 3232
  - Net Population affected = -20

- **Local Air Quality**
  - **ASSESSMENT:** NO2 - 170,000 PM10 0

- **Greenhouse Gases**
  - The do something scenario will have a positive impact as it reduces carbon dioxide emissions when compared to the do nothing scenario, it will therefore go towards achieving national targets. Rail emissions not taken into account.
  - **ASSESSMENT:** -1130.2 tonnes of CO2

- **Landscape**
  - Effects on distinctive estuary landscape of local / sub-regional importance and its developed, somewhat degraded margins.
  - **ASSESSMENT:** SLIGHT - MODERATE ADVERSE

- **Townscape**
  - Route of new crossing has a negligible effect on townscape.
  - **ASSESSMENT:** NEUTRAL

- **Heritage of Historic Resources**
  - Slight effect on selling and visual impact of a landmark feature that cannot be mitigated. Given greater length of bridge and access roads and of some pier/ground works within the estuary there is a higher potential of uncovering previously undiscovered remains of heritage interest.
  - **ASSESSMENT:** SLIGHT - MODERATE ADVERSE

- **Biodiversity**
  - Incorporation of statutory requirements (ES&EN) to mitigate potential impact on ecology of the Mersey Estuary including sensitive procedures at the construction stage recognising seasonal constraints.
  - **ASSESSMENT:** MODERATE ADVERSE

- **Water Environment**
  - Construction: LARGE ADVERSE
  - Operation: LARGE ADVERSE
  - Decommissioning: LARGE ADVERSE
  - **ASSESSMENT:** LARGE ADVERSE

- **Physical Fitness**
  - The New Crossing will increase walking and cycling for approximately 2400 people. This will be predominantly home to work shopping trips. As a result, physical fitness in excess of 30 minutes is low, but below 30 minutes is very high.
  - **ASSESSMENT:** Pedestrians +87
  - Cyclists +10
  - Score +97

- **Journey Ambience**
  - Benefits in Traveller views and environment are offset by a potential deterioration caused by an excess of information at the terminal junctions.
  - **ASSESSMENT:** NEUTRAL

#### Safety

- **Accidents**
  - The new crossing will result in a small decrease in serious and slight accidents.
  - **ASSESSMENT:** Reduction In annual accidents: Fatal: 0
  - Serious: 4
  - Slight: 19
  - PVB £26.1m

- **Security**
  - Security for all road users will increase (especially with the introduction of CCTV), also benefits for households, pedestrians and public transport users.
  - **ASSESSMENT:** MODERATE BENEFICIAL

#### Economy

- **Public Accounts**
  - The crossing will provide relief, allowing traffic to flow more freely. The benefits shown are generated primarily by the relief of the delay, rather than by providing alternative route choices. The traffic figures are based on a variable demand, providing some measure of both suppressed and released induced traffic within the analysis. Analysis results in a Net Present Value of £1002m and a Benefit to Cost Ratio (BCR) of 3.793 over the appraisal period 2007 to 2036 (discounted to 1998 prices).
  - **ASSESSMENT:** Large Beneficial
  - Score 4,719,000

- **Business Users & Providers**
  - The New Crossing will result in a small decrease in serious and slight accidents.
  - **ASSESSMENT:** Large Beneficial
  - Score 4,719,000

- **Consumer Users**
  - An extra £90m in gross development value; £629.1m in commercial property value; £731.5m in public accounts.
  - **ASSESSMENT:** Large Beneficial
  - Score 4,719,000

- **Reliability**
  - A stress based approach considers stress as the ratio of daily traffic to the congestion reference flow. Impact is the change in stress x daily flow (AADT).
  - **ASSESSMENT:** Large Beneficial
  - Score 4,719,000

- **Wider Economic Impacts**
  - The NMC is expected to contribute significantly to the growth of the wider NW economy and to regeneration of the Mersey Belt Priority Area through enhancement of the image of the area, increased attractiveness to inward investment, and strengthening and deepening of the economic base of the area.
  - **ASSESSMENT:** Large Beneficial
  - Score 4,719,000

### Accessibility

- **Option values**
  - **ASSESSMENT:** LARGE BENEFICIAL

- **Severance**
  - **ASSESSMENT:** NEUTRAL

- **Access to the Transport System**
  - **ASSESSMENT:** NEUTRAL

- **Transport Interchange**
  - **ASSESSMENT:** SLIGHT BENEFICIAL

- **Land Use Policy**
  - **ASSESSMENT:** LARGE BENEFICIAL

- **Other Government Policies**
  - **ASSESSMENT:** MODERATE BENEFICIAL
10.6 Route 3 Long Spans

Option
Route 3 Long Span Bridge

Description
A new route to link the Central Expressway in Runcorn to the dual carriageway network in Widnes, approximately 2km upstream of the SJB.

Problems
SJB acts as a control to the road network capacity.

Present Value Costs to Public Accounts
£365.8

<table>
<thead>
<tr>
<th>OBJECTIVE</th>
<th>SUB-OBJECTIVE</th>
<th>QUALITATIVE IMPACTS</th>
<th>QUANTITATIVE MEASURE</th>
<th>ASSESSMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVIRONMENT</td>
<td>Noise</td>
<td>Route 3 results in an additional 20 people being annoyed with most of them being in the higher noise exposure categories.</td>
<td>Do-Minimum: 3232 Do-something (2022): 3252</td>
<td>Net Population affected: +20</td>
</tr>
<tr>
<td></td>
<td>Local Air Quality</td>
<td>The proposal does not lead to an increase in PM10 levels by over 20mg/m3 or NO2 levels by over 40mg/m3. The proposal does not exceed the AQS NO2 objective of 40mg/m3.</td>
<td>NO2: 79.4-805 PM10 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Greenhouse Gases</td>
<td>The do something scenario will have a positive impact as it reduces carbon dioxide emissions when compared to the do nothing scenario, it will therefore go towards achieving national targets. Rail emissions not taken into account.</td>
<td>Total of 1033 properties are likely to be affected.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Landscape</td>
<td>Effects on distinctive estuary landscape of local/sub-regional importance and its developed, sometimes degraded margins.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Townscape</td>
<td>Route of new crossing has a negligible effect on townscape.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heritage of Historic Resources</td>
<td>Slight effect on selling and visual impact of a landmark feature that cannot be mitigated. Greater weight of bridge and access roads and of some piers/ground works within the estuary there is a medium potential of uncovering previously undiscovered remains of historic interest.</td>
<td>Slight ADVERSE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biodiversity</td>
<td>Incorporation of statutory requirements (ES4/EN) to mitigate potential impact on ecology of the Mersey Estuary including sensitive procedures at the construction stage recognising seasonal constraints.</td>
<td>Construction: LARGE ADVERSE Operation: LARGE ADVERSE Decommissioning: LARGE ADVERSE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water Environment</td>
<td>The Mersey Estuary and Manchester Ship Canal in particular are well known national features. The Mersey is of a local scale with a high rarity; the Ship Canal is of regional scale with a moderate rarity. The aquifer is local but with high rarity and cannot be re-created</td>
<td>MODERATE ADVERSE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Physical Fitness</td>
<td>The New Crossing will increase walking and cycling for approximately 2400 people. This will be predominantly home to work shopping trips.</td>
<td>Pedestrians +87 Cyclists +10</td>
<td>Score +97</td>
</tr>
<tr>
<td></td>
<td>Journey Ambience</td>
<td>Benefits in Traveler views and environment are offset by a potential deterioration caused by an excess of information at the terminal junctions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAFETY</td>
<td>Accidents</td>
<td>The new crossing will result in a small decrease in serious and slight accidents.</td>
<td>Reduction in annual accidents: Fatal: 0 Serious: 4 Slight: 19</td>
<td>PVB £26.1m</td>
</tr>
<tr>
<td></td>
<td>Security</td>
<td>Security for all road users will increase (especially with the introduction of CCTV), also benefits for households, pedestrians and public transport users.</td>
<td>Central Gvt PVC: £365.8 Local Gvt PVC £0</td>
<td>MODERATE BENEFICIAL</td>
</tr>
<tr>
<td>ECONOMY</td>
<td>Public Accounts</td>
<td>The crossing will provide relief, allowing traffic to flow more freely. The benefits shown are generated primarily by the relief of the delay, rather than by providing alternative route choices. The traffic figures are based on a variable demand, providing some measure of both suppressed and released induced traffic within the analysis. Analysis results in a Net Present Value of £195m and a Benefit to Cost Ratio (BCR) of 3.719 over the appraisal period 2007 to 2036.</td>
<td>Business Users PVB £629.1 Private Sector Providers PVB £0 Other PVB £0</td>
<td>PVB £629.1</td>
</tr>
<tr>
<td></td>
<td>Business Users &amp; Providers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consumer Users</td>
<td></td>
<td>Consumer Users PVB £731.5</td>
<td>PVB £731.5</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>A stress based approach considers stress as the ratio of daily traffic to the congestion reference flow. Impact is the change in stress x daily flow (AADT).</td>
<td>Large Beneficial</td>
<td>Score 4,719,000</td>
</tr>
<tr>
<td></td>
<td>Wider Economic Impacts</td>
<td>The NMC is expected to contribute significantly to the growth of the wider NW economy and to regeneration of the Mersey Basin Priority Area through enhancement of the image of the area, increased attractiveness to inward investment, and strengthening and deepening of the economic base of the area.</td>
<td>£6,930m2 news/sub commercial floorspace; 5% house price increase; 3,350 additional jobs; 1,600 person years construction jobs; £86m per annum additional value added; £90m increase in commercial property value; £73m increase in gross development value; 1.4% improvement in unemployment rates; 1.5% increase in town centre turnover</td>
<td>YES</td>
</tr>
<tr>
<td>ACCESSIBILITY</td>
<td>Option values</td>
<td>The crossing will provide value to more than 100,000 residents and workers in Halton</td>
<td>LARGE BENEFICIAL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severance</td>
<td>All routes subject to increased traffic flows are provided with existing grade separated crossings.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access to the Transport System</td>
<td>Most properties in Halton are within 250m of a daily hourly bus service. The new crossing will have no impact.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTEGRATION</td>
<td>Transport Interchange</td>
<td>Unpredictable journey time can lead to missed connections to public transport facilities, Liverpool John Lennon Airport and Manchester Airport.</td>
<td>Passenger interchange SLIGHT BENEFICIAL Freight interchange SLIGHT BENEFICIAL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Land-Use Policy</td>
<td>Complies fully with many national, regional and local land use and planning policies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other Government Policies</td>
<td>Complies with policies of DEFRA, Cabinet Office, DCMS, DRIE, DIT, FCO, DoH, Home Office, DWP, Treasury</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Option 10.7 Route 3A Short Spans

<table>
<thead>
<tr>
<th>Description</th>
<th>Problems</th>
<th>Present Value Costs to Public Accounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>A new route to link the Central Expressway in Runcorn via the Ditton Road link to the A562, approximately 2km upstream of the SJB.</td>
<td>SJB acts as a control to the road network capacity.</td>
<td>£3,433.5m</td>
</tr>
</tbody>
</table>

#### Qualitative Impacts

<table>
<thead>
<tr>
<th>Objective</th>
<th>Qualitative Impacts</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>Noise</td>
<td>The proposal does not lead to an increase in PM10 levels by over 20mg/m³ or NO2 levels by over 40mg/m³. The proposal does not exceed the AQS objective of 40mg/m³.</td>
</tr>
<tr>
<td></td>
<td>Local Air Quality</td>
<td>Route of new crossing has a negligible effect on townscapes.</td>
</tr>
<tr>
<td></td>
<td>Greenhouse Gases</td>
<td>The crossing will provide relief, allowing traffic to flow more freely. The benefits shown are generated primarily by the relief of the delay, rather than by providing alternative route choices. The traffic figures are based on a variable demand, providing some measure of both suppressed and released induced traffic within the analysis. Analysis results in a Net Present Value of £975m and a Benefit to Cost Ratio (BCR) of 3.838 over the appraisal period 2027 to 2036 (discounted to 1998 prices).</td>
</tr>
<tr>
<td></td>
<td>Landscape</td>
<td>The New Crossing will increase walking and cycling for approximately 3400 people. This will be predominantly home to work shopping trips. As a result, physical fitness in excess of 30 minutes is low, but below 30 minutes is very high.</td>
</tr>
<tr>
<td></td>
<td>Heritage of Historic Resources</td>
<td>Incorporation of statutory requirements (EA/EN) to mitigate potential impact on ecology of the Mersey Estuary including sensitive procedures at the construction stage recognising seasonal constraints.</td>
</tr>
<tr>
<td></td>
<td>Biodiversity</td>
<td>The Mersey Estuary and Manchester Ship Canal in particular are well known national features. The Mersey is of a local scale with a high rarity; the Ship Canal is of regional scale with a moderate rarity. The aquifer is local but with high rarity and cannot be re-created.</td>
</tr>
<tr>
<td></td>
<td>Water Environment</td>
<td>The NMC is expected to contribute significantly to the growth of the wider NW economy and to regeneration of the Mersey Belt Priority Area through enhancement of the image of the area, increased attractiveness to inward investment, and strengthening and deepening of the economic base of the area.</td>
</tr>
</tbody>
</table>

#### Quantitative Measures

<table>
<thead>
<tr>
<th>Objective</th>
<th>Quantitative Measure</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Accidents</td>
<td>Reduction In annual accidents: Fatal: 0 Serious: 3 Slight: 16</td>
</tr>
<tr>
<td></td>
<td>Security</td>
<td>Security for all road users will increase (especially with the introduction of CCTV), also benefits for households, pedestrians and public transport users.</td>
</tr>
<tr>
<td>Economy</td>
<td>Public Accounts</td>
<td>Central Govt PVC -£3,433.5m</td>
</tr>
<tr>
<td></td>
<td>Business Users &amp; Providers</td>
<td>Business Users PVC BVB £609.7m Private Sector Providers PVC BVB £0 Other PVC £0</td>
</tr>
<tr>
<td></td>
<td>Consumer Users</td>
<td>Consumer Users PVC BVB £708.7m</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>A stress based approach considers stress as the ratio of daily traffic to the congestion reference flow. Impact is the change in stress x daily flow (AADT) Large Beneficial</td>
</tr>
<tr>
<td></td>
<td>Wider Economic Impacts</td>
<td>The NMC is expected to contribute significantly to the growth of the wider NW economy and to regeneration of the Mersey Belt Priority Area through enhancement of the image of the area, increased attractiveness to inward investment, and strengthening and deepening of the economic base of the area.</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Option Values</td>
<td>The crossing will provide value to more than 100,000 residents and workers in Halton</td>
</tr>
<tr>
<td></td>
<td>Severance</td>
<td>All routes subject to increased traffic flows are provided with existing grade separated crossings.</td>
</tr>
<tr>
<td></td>
<td>Access to the Transport System</td>
<td>Most properties in Halton are within 250m of a daily hourly bus service. The new crossing will have no impact.</td>
</tr>
<tr>
<td></td>
<td>Transport Interchange</td>
<td>Unexpected journey time can lead to missed connections to public transport facilities, Liverpool John Lennon Airport and Manchester Airport.</td>
</tr>
<tr>
<td></td>
<td>Land-Use Policy</td>
<td>Comply fully with many national, regional and local land use and planning policies.</td>
</tr>
<tr>
<td></td>
<td>Other Government Policies</td>
<td>Comply with policies of DEFRA, Cabinet Office, DCMS, DfEE, DIT, FCO, DoH, Home Office, DWP, Treasury</td>
</tr>
</tbody>
</table>

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Halton Borough Council Annual Progress Report
Appendix 1
Major Scheme Appraisal for the New Mersey Crossing
Volume 1

Gifford and Partners
Page 7
Report No. Error No text of specified style in document.MSA/01
### 10.8 Route 3A Medium Spans

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Problems</th>
<th>Present Value Costs to Public Accounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 3A Medium Span Bridge</td>
<td>A new route to link the Central Expressway in Runcorn via the Ditton Road link to the A562, approximately 2km upstream of the SJB.</td>
<td>SJB acts as a control to test the road network capacity.</td>
<td>£3,998.7m</td>
</tr>
</tbody>
</table>

#### Objective

**Route 3A results in an additional 20 people being annoyed with most of them being in the higher noise exposure categories.**

#### Qualitative Impacts

<table>
<thead>
<tr>
<th>Environment</th>
<th>Sub-Objective</th>
<th>Qualitative Impacts</th>
<th>Quantitative Measure</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td>Route 3A results in an additional 20 people being annoyed with most of them being in the higher noise exposure categories.</td>
<td>Do-Minimum 3232</td>
<td>Net Population affected: 20</td>
<td></td>
</tr>
<tr>
<td>Local Air Quality</td>
<td>The proposal does not lead to an increase in PM10 levels by over 20g/m3 or NO2 levels by over 40g/m3. The proposal does not exceed the AQ5 NO2 objective of 40g/m3.</td>
<td>Do-Something (2022): 3252</td>
<td>PM10 ≤ 109.05 NO2 ≤ 178.005</td>
<td></td>
</tr>
<tr>
<td>Greenhouse Gases</td>
<td>The do something scenario will have a positive impact as it reduces carbon dioxide emissions when compared to the do nothing scenario, it will therefore go towards achieving national targets. Rail emissions not taken into account.</td>
<td>-1130.2 tonnes of CO2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape</td>
<td>Effects on distinctive estuary landscapes of local / sub-regional importance and its developed, sometimes degraded margins.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Townscape</td>
<td>Route of new crossing has a negligible effect on townscape.</td>
<td>Slight - Moderate Adverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heritage of Historic Resources</td>
<td>Right effect on setting and visual impact of a landmark feature that cannot be mitigated. Greater length of bridge and access roads and of some pier/ground works within the estuary there is a higher potential of uncovering previously undiscovered remains of heritage interest.</td>
<td>Slight - Moderate Adverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biodiversity</td>
<td>Incorporation of statutory requirements (EIA/BEN) to mitigate potential impact on ecology of the Mersey Estuary including sensitive procedures at the construction stage recognising seasonal constraints.</td>
<td>Construction: Large Adverse Operation: Large Adverse Decommissioning: Large Adverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Environment</td>
<td>The Mersey Estuary and Manchester Ship Canal in particular are well known national features. The Mersey is of a local scale with a high rarity; the Ship Canal is of a local scale with a moderate rarity. The aquifer is local but with high rarity and cannot be re-created.</td>
<td>Moderate Adverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Fitness</td>
<td>Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accidents</td>
<td>Security for all road users will increase (especially with the introduction of CCTV), also benefits for households, pedestrians and public transport users.</td>
<td>Reduction in annual accidents: Fatal: 0 Slight: 16</td>
<td>(£19.9m)</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Accounts</td>
<td>The crossing will provide relief, allowing traffic to flow more freely. The benefits shown are generated primarily by the relief of the delay, rather than by providing alternative route choices. The traffic figures are based on a variable demand, providing some measure of both suppressed and released induced traffic within the analysis. Analysis results in a Net Present Value of £319m and a Benefit to Cost Ratio (BCR) of 3.299 over the appraisal period 2007 to 2036 (discounted to 1998 prices).</td>
<td>Central Govt PVC £399.7m Local Govt PVC £0</td>
<td>Moderate Beneficial</td>
<td></td>
</tr>
<tr>
<td>Business Users &amp; Providers</td>
<td></td>
<td>Business Users PVC £609.7m Private Sector Providers PVC £0 Other PVC £0</td>
<td>£609.7m</td>
<td></td>
</tr>
<tr>
<td>Consumer Users</td>
<td></td>
<td>Consumer Users PVC £708.7m</td>
<td>£708.7m</td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td>A stress based approach considers stress as the ratio of daily traffic to the congestion reference flow. Impact is the change in stress x daily flow (AADT).</td>
<td>Stress Based Approach: Large Beneficial</td>
<td>Score 7,833,000</td>
<td></td>
</tr>
<tr>
<td>Wider Economic Impacts</td>
<td>The NMC is expected to contribute significantly to the growth of the wider NW economy and to regeneration of the Mersey Belt Priority Area through enhancement of the image of the area, increased attractiveness to inward investment, and strengthening and deepening of the economic base of the area.</td>
<td>(+9.5m2 new/modified commercial floor space; 5% house price increase; 3,350 additional jobs; 1,600 person-years construction jobs; £85 per annum additional value added: £90m increase in commercial property value; £73m increase in gross development value; 1.4% improvement in unemployment rates; 1.5% increase in town centre turnover)</td>
<td>YES</td>
<td></td>
</tr>
</tbody>
</table>

#### Accessiblity

<table>
<thead>
<tr>
<th>Option Values</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity</td>
<td>All routes subject to increased traffic flows are provided with existing grade separated crossings.</td>
<td></td>
<td>Neutral</td>
</tr>
<tr>
<td>Access to the Transport System</td>
<td>Most properties in Halton are within 250m of a daily hourly bus service. The new crossing will have no impact.</td>
<td></td>
<td>Neutral</td>
</tr>
<tr>
<td>Integration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Interchange</td>
<td>Unpredictable journey time can lead to missed connections to public transport facilities, Liverpool John Lennon Airport and Manchester Airport. Freight connections at docks can be missed</td>
<td>Passenger Interchange: Slight Beneficial Freight Interchange: Slight Beneficial</td>
<td></td>
</tr>
<tr>
<td>Land Use Policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Government Policies</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Other Government Policies

- DEFRA, Cabinet Office, DCMS, DfE, DTI, FCO, DfH, Home Office, DWP, Treasury
11. SUPPORTING ANALYSIS

11.1 Distribution and Equity

A Social Impact Assessment for the project has been provided as Technical Report B4027/TR12/01 – Social Impacts.

In 2000, a comprehensive survey of deprivation was undertaken by the DETR, (now The Office for the Deputy Prime Minister and Department of the Environment Food and Rural Affairs), who commissioned a team at the University of Oxford to produce an Index of Multiple Deprivation (IMD) for each ward within England. They updated and enhanced work done on the 1991 National Census data and 1998 Indices of Local Deprivation. This IMD data was used to assess the sensitivity of wards within Halton and therefore the likely significance of impact on individuals and families.

The Index of Multiple Deprivation Survey showed that 10 of Halton’s 21 wards are included in the top 10% most deprived wards in England, representing 54% of Halton’s total population (Halton Borough Council: IMD A Halton Perspective report 2000). This suggests that residents in Halton may be sensitive to both the positive and negative effects created by the construction of a new crossing in the Borough.

From the social assessment, the Do-Nothing option, although having the benefit of no disruption to communities, does not solve the problems of increasing congestion and could limit the community regeneration potential of the area. The construction of a second road crossing in Halton should go towards improving the long-term quality of life experienced by many residents.

However, construction of Route 1 will have a severe and significant social impact on individuals and families in the surrounding areas of West Bank and Runcorn and in Halton in general. The construction of this route will result in the demolition of a number of residential properties and community facilities and this will have significant social implications.

Disruption during construction will be a further major impact associated with Route 1 due to its location next to the Silver Jubilee Bridge (SJB) and within residential areas. Disruption may therefore be experienced by not only local residents but by people wishing to travel across the Mersey via the SJB. Air quality, health and safety issues are associated with the construction phase and possible increased traffic to the area. These are likely to mainly affect individuals and families in surrounding areas, who are sensitive and vulnerable to such impacts.

Health impacts have also been considered with regard to air quality and noise implications. However, there are a number of less easily defined health implications such as that of community stress. A detailed Health Impact Assessment is to be carried out in the near future for the preferred route.

Further development of mitigation measures specific to the chosen option will need to be undertaken. Finally suitable indicators will also need to be identified in against which actual impacts of the chosen Route can be monitored.
11.2 Affordability and Financial Sustainability

A full Economic Impact Assessment for the project has been provided as Technical Report B4027/TR13/01 – Economic Impacts.

This assessment of the economic and regeneration impacts of the NMC has identified that the project would generate substantial additional quantifiable and wider benefits. It would contribute significantly to the economic regeneration of Halton and the surrounding districts.

The NMC project fits very well with national, regional, sub-regional and local policy objectives. It would result in significant travel timesavings. The project would be expected to generate significant development and economic benefits, estimated as follows:

- 20,000 sq m of additional new and refurbished commercial floorspace;
- 3,350 total net additional permanent jobs created;
- 1,130 – 1,600 person/year of temporary construction employment created;
- £85m per annum in net additional Gross Value Added;
- £90m increase in existing commercial property values;
- 5% increase in average house prices; and
- £15 million of additional development value.

The net additional employment generated has the potential to make a significant impact on the relatively high unemployment levels in local areas, provided that local residents are trained and assisted to access the emerging opportunities.

The NMC will enhance accessibility to Widnes town centre and the district centre at Halton Lea. It will also generate opportunities and facilities that are accessible to residents of wards identified as suffering from acute levels of deprivation. The NMC will also complement a number of area-based regeneration projects that are underway in the area.

As well as the quantifiable benefits, the NMC project is expected to generate wider, less tangible benefits including:

- urban renaissance;
- image enhancement;
- inward investment; and
- strengthening the economic base
11.3 Practicality and Public Acceptability

11.3.1 Public Consultation

Throughout the lifetime of the project, consultation with the general public, local businesses and interest groups have been extensively carried out. The Consultation Technical Report is included as TR16/01.

There are three distinct consultation phases to inform different stages within the project development as follows:

There are three distinct public consultation phases to inform different stages within the project development as follows.

Stage 1, carried out between September and November 2002, focused on current perceptions of the SJB and travel needs. The report details: current use of the bridge; problems using the bridge and their impacts; suggested improvements to the bridge; support for a new crossing; and expectations and potential impacts of a new crossing.

The Stage 1 public consultation also included initial perceptions on a number of possible crossing options although the selection of a preferred route option was not an objective at this stage.

Since the completion of Stage 1, research has provided an assessment of the impact of each of the options. Stage 2 has therefore concentrated on detailed discussions of the route options, including: probable impacts; advantages; disadvantages and preferred options.

Stage 2, carried out between February and April 2003, again included the identified stakeholder groups: residents of Halton; businesses in the region; and local interest groups.

Stage 3 of the consultation is currently being undertaken. This is to focus on the details of the preferred route and any concerns of residents and businesses affected by the preferred route.

This assessment will concentrate on the first two phases of the consultation.

11.3.2 Public Opinion

The local population of Runcorn and Widnes are almost unanimous in their support for a new crossing of the river.

During extensive consultations, over 1200 people were questioned and 97.4% of those agreed that there was a need for a new bridge across the river.

On the more general question of the importance of good links between Runcorn and Widnes, 97.1% of those questioned felt that good links were either important or very important.

Business representatives agreed with the need for a new crossing to solve congestion problems. It was emphasised that a new bridge is very important to large companies such as Jaguar and Liverpool Airport who have invested heavily and made a commitment to Merseyside over the last 3-5 years and who are forecasting substantial future growth.
Over three quarters of travellers resident in other areas agreed that a new crossing is required.

11.3.3 Statutory Consultation

In accordance with Government guidance, the views of the following statutory bodies have been obtained:

- English Nature
- Environment Agency
- Countryside Agency
- English Heritage

A copy of their responses is shown in Technical Report TR/16/01.

11.3.4 Wider Consultation

In addition to the consultees and MCG partners indicated above, the following are those whose views have been sought in the preparation of this project. All the responses have been collated in the Technical Report and a list of consultees and supporting groups provided at Appendix C and Appendix D.
12. PREFERRED ROUTE

12.1 Preferred Route

On the basis of the foregoing appraisal, the Mersey Crossing Group and Halton Borough Council have unanimously selected Route 3A as their preferred choice for The New Mersey Crossing.

Figure 12.1 below shows the detailed alignment of the route:

![Figure 12-1 Route of the New Mersey Crossing](image)

12.2 Selection of the Preferred Route

Route 3A has been selected as providing the best means for satisfying the key objectives of a new crossing of the River Mersey.

Route 3A runs from the junction between the Central Expressway with the Bridgewater and Daresbury Expressways on the south bank. A fully grade separated junction will be formed extending the Central Expressway over the other Expressways and by viaduct over the Astmoor Industrial Estate. The elevated structure continues over the Manchester Ship Canal at a level providing the necessary navigation clearance before swinging west over Wigg Island and the southern Salt marshes. It crosses the Upper Mersey Estuary gradually reducing in elevation to cross the salt marshes of Widnes Warth. A bridge will be provided over the St Helens (Sankey)
canal and a grade separated junction provided with the A568 to the west of the Rhodia Plant. The route is then continued to link with the A562 Liverpool Road.

The reasons for preferring route 3A can be summarised as follows:

- The main community centres within the area are Runcorn on the south bank and Widnes on the north. The shortest route between those two centres is at the Runcorn Gap using the existing Silver Jubilee Bridge. The problem is that the existing bridge is dominated by traffic crossing the river from north of Widnes and south of Runcorn. Provision for this traffic (4 narrow lanes within a single carriageway) is resulting in severe congestion that produces intimidating conditions for pedestrians and cyclists. For public transport to be effective it must offer a regular and reliable service. To enable that, it must have a corridor through which it has some form of priority and preferred access. It is perfectly possible to provide such a service for buses over Silver Jubilee Bridge and to provide a much-improved provision for cyclists and walkers but to do that requires removing over 80% of the traffic currently using the bridge.

- A new bridge parallel to Silver Jubilee Bridge (Route 1) brings with it an extraordinary impact on Runcorn and Widnes West Bank involving substantial demolition of property and perpetuating the adverse effect of noise and poor air quality on those residents that remain. The tie-ins with the existing network, particularly with the expressways on the south bank, require a complex of elevated viaducts dominating the residential area.

- Route 2 is complicated by the junction on the South bank. In order to attain sufficient headroom to cross the Manchester Ship Canal, the access to the new bridge will need to be at high level. This requires the existing junction between the Bridgewater Expressway and the entrance to the Astmoor Industrial Estate to be substantially modified. The Expressway will require reducing to the same level as the Industrial Estate access road and a new roundabout forming. Elevated structures linking with the bridge viaduct can then be formed and taken above the Industrial Estate access road on the same alignment. The resulting traffic management implications during construction are obvious. The Industrial Estate is an important contributor to the local economy and the final junction arrangement for those using the new bridge is far from ideal (requiring them to join the Bridgewater Expressway to the junction with Central Expressway before returning to the Astmoor entrance to gain access).

- Route 3 does not perform as well as Route 3A. Additionally, the north end of the scheme takes some of the very valuable land within the new Economic Development Zone at Widnes Warth.

- Route 3A lies naturally on the desire line for through traffic. As a result, it attracts 90% of traffic currently using Silver Jubilee Bridge. This satisfactorily relieves the Silver Jubilee Bridge and permits its return to local use.

- Route 3A avoids residential areas and has a minimal impact on industrial areas. Its elevation on the southern bank provides a real opportunity for exploiting the area under the bridge within the Astmoor estate for commercial use.
• Route 3A involves the least impact on the existing highway network requiring a minimum of disruption to traffic and the local economy during construction.

12.3 Span Option

The tidal estuary of the River Mersey is a complex feature. The natural fluvial flows of the rivers feeding into the estuary (even in times of flood) provide only a minor proportion of water movement with the basin. It is the ebb and flow of the tide that is the major factor.

The estuary itself is a large body of water extending from its bar in the Irish Sea off Bootle and New Brighton in the Wirral to its upstream limit at Howley Weir in Warrington. The estuary is divided into an upper and lower element by the narrowing at the Runcorn Gap. This narrowing has a dominating influence on the form of the tide in the upper estuary. The restriction at the Gap holds back the incoming tide steepening the flood portion of the normal tidal sine curve and producing strong currents through the Gap. The ebb is a more leisurely process.

These differences in flow patterns result in a very changeable structure to sediment movements within the basin. The sand banks are in continual flux and the main river channel varies between the north and south banks of the estuary. Level differences within the sand banks can alter by 2 metres or more. It is this process of change that is viewed as a desirable feature and of environmental benefit. Additionally, the extensive salt marshes are only flooded on the very highest of storm tides, provide a valuable habitat for wading birds and other species.

The most economic structure would be to cross the estuary on a series of relatively short spans of approximately 100 metres. This results in 11 piers within the tidal estuary and this inevitably has an impact on the way the estuary performs. A large number of piers within the tidal estuary will have an impact on the existing tidal regime. Local velocities will be changed and erosion and accretion patterns amended.

Reducing the number of piers within the estuary has obvious benefits. As an alternative to the 100 metre spans, alternatives have been considered involving much longer span structures. A single span crossing the 1000 metre estuary is technically possible but will be very expensive and would conflict with the approach flight paths of aeroplanes to the Liverpool John Lennon Airport.

An acceptable compromise is believed to be provided by a 3-span crossing of the tidal estuary with spans of approximately 360 metres. This will require two supporting tower to be constructed within the sand banks. Modelling shows that there will still be some erosion and accretion changes relative to the do nothing scenario but that these are limited to values in the order of 0.1 metre or less (within the context of movements in the order of 2 metres). The large openings provided by the increased spans also interfere very much less with the limited amount of small boat movements navigating the river. The “larger” bridging option also permits a more dramatic structural form providing a distinctive signature for the new crossing and one more likely to contribute to the built environment. Such a solution, however, is more expensive in capital terms than the “short span” option.

There is a significant economic benefit in providing short spans (a Benefit-Cost Ratio (BCR) of 3.837), but this is offset by disbenefits in environmental degradation (large adverse reactions in respect of biodiversity).
Although the medium spans still offer some slightly adverse reactions in terms of biodiversity, landscape, and water quality, it still shows a BCR of 3.298.

It is therefore considered that the MEDIUM SPAN option be selected as the preferred span option.

12.4 Traffic and Transportation

Traffic modelling has been undertaken throughout the development of this assessment. In the Traffic Forecasting Technical Report TR23/01, we demonstrate that the route will transfer approximately 80% of the total traffic flow from the Silver Jubilee Bridge (SJB) to the new crossing.

This will allow the SJB to be remodelled and roadspace reallocated. It is proposed that the SJB will be reduced from 4 to 2 lanes and there will be dedicated provision for pedestrians and cyclists. Increased walking and cycling is likely to ensue – the towns of Runcorn and Widnes have historically developed around the SJB, as the only crossing point between the two, and many of the main destinations of travel are located near to the bridge.

Furthermore, this route will allow the realisation of the Borough’s integrated transport policy.

Buses will not be given their own dedicated lanes on the SJB, but the significant reductions in traffic flow will allow reliability to increase.

The SJB will be viewed fundamentally as a local bridge. The alignment of junctions on the routes to the SJB will deter strategic traffic. Consequently, there will be no timesavings to be made from using this crossing as an alternative to the new bridge.

12.5 Problem Resolution

The following were identified as the specific problems of the region that this route would help resolve:

- Economics and Regeneration

The assessment in Section 11.2 above has demonstrated that the crossing will bring substantial economic benefits to the region. The crossing will result in a Net Present Value of nearly £1 billion.
• **Social Impact**

Without a new crossing, the area will continue to suffer from deprivation, and problems will be likely to worsen. The New Mersey Crossing is an essential ingredient in bringing about the urban renaissance needed in the area.

• **Personal Injury Accidents**

The accident analysis prepared as part of Accidents Technical Report (TR26/01) finds that accident rates in Halton as a whole are less than as predicted by COBA. However, the average rate of accidents in the vicinity of the bridge is higher than the average rate on the network. This is perhaps not unsurprising given the degree of separation provided by the expressway system, bus ways, etc. Equally, because of the degree of disruption which even a minor accident on the SJB can cause at peak times, the accident record is perhaps perceived to be worse than the reality. Records are not available of damage only accidents, which nevertheless can incur significant delay and disruption to SJB traffic.

It has also shown that the average rate of accident per kilometre is higher for the section of the network covering the SJB and its approaches, when compared to the average accident rate for the entire network.

It is evident that the new scheme will serve a dual purpose, not only would it relieve traffic on the existing bridge, but should also achieve a reduction in accident due to improved alignment standard and reduced congestion on both SJB and NMC.

• **Access for Emergency Vehicles**

Emergency vehicles will have a choice of routes by which to cross the Mersey. This will significantly improve response times, and aid in emergency planning.

• **Strategic Traffic Movement**

The provision of this route will transfer 80% of the traffic from the SJB allowing it to be dedicated solely as a local crossing point.

• **Congestion**

At Appendix B, we have demonstrated the Congestion Reference Flow for the revised cross section of the SJB. Following construction of the New Mersey Crossing, the CRF is forecast to be 18,500 AADT. The actual traffic that is predicted to use this bridge, from the Traffic Forecasting Technical Report TR23/01 is of the order of 12,500 per day. Clearly, therefore, congestion is not likely to be an issue on the SJB.

• **Availability of Public Transport**

The majority of properties in Halton are within 250m of an hourly bus service. This is a key indicator of the local operators and also a primary Government statistic.
The new crossing will reduce congestion on the SJB to such an extent that buses will travel within standard carriageway lanes, without the need for formal segregation, and allow reliability to be greatly increased.

- Pedestrian and Cyclist facilities

The level of strategic traffic transfer resulting from the provision of the new crossing will result in a reallocation of roadspace on the SJB, meaning that dedicated pedestrian and cyclist facilities will be able to be provided on the SJB.

12.6 Economic Impact

The assessment of economic and regeneration impacts of the preferred route has identified that the project would generate substantial additional quantifiable and wider benefits. It would contribute significantly to the economic regeneration of Halton and the surrounding districts. The NMC project fits very well within national, regional, sub-regional and local policy objectives. It would result in significant travel timesavings and as such would be expected to generate significant economic development in the Halton area.

The net additional employment generated has the potential to make a significant impact on the relatively high unemployment levels in local areas, provided that local residents are trained and assisted to access the emerging opportunities. The crossing will enhance accessibility to Liverpool John Lennon Airport, the Runcorn and Weston Point ports, Widnes town centre and the district centre at Halton Lea. It will also generate opportunities and facilities that are accessible to residents of wards identified in the Social Impact Assessment as suffering from acute levels of deprivation. The NMC will also complement a number of area-based regeneration projects that are underway in the area.

The crossing will provide significant economic benefits as indicated in the Economic Impact Assessment. It is considered that there will also be added benefits to Widnes and some effects also on Liverpool, Ditton, Runcorn and Speke.

The current unemployment rates within Liverpool and Halton are at worst, around 5.8%. The route proposals will have a demonstrable but modest effect on unemployment, although the effects of other initiatives on factors such as skill levels, would be expected to increase the access rates of residents of these wards into employment created as a result of the NMC.

This route would also be expected to have benefits for the Port of Liverpool and the Port of Garston, as well as Liverpool John Lennon Airport.

The crossing will enhance the accessibility to Widnes and Halton Lea district centres and it is anticipated that there will be an increase in sales generated as a result. It is estimated that as a result of additional employment generated by the NMC, additional disposable income will be spent in retail centres within the region, including Widnes town centre and Halton Lea district centre.
12.7 Social Impact

A major social issue with the construction of Route 3A issue is likely to be that of employment opportunities. Unemployment across Halton is high and if, as predicted, a new crossing in Halton has the potential to improve employment opportunities these rates will be reduced. Particularly sensitive receptors are likely to be the communities in Riverside and Castlefield close to the bridge nodes of Route 3A. These areas are highly deprived and sensitive to any adverse changes caused by Route 3A.

Particular impacts may be the disruption the construction phase may cause for the daily movement of individuals around Halton and disruption to social networks in these areas.

However, following initial construction impacts, Route 3A will have a number of positive social impacts on these communities, strengthening social links across the Mersey, providing good access to community infrastructure, attracting people to Halton and people to stay in Halton that may previously have left.

12.8 Public Opinion

In general terms, 97% of those questioned in the early stages of consultation were in support of a new crossing across the river.

On the more specific question of route preference the following preferences (total responses 1484) were identified:

Reasons for preference stated were dependent on route, with respondents that selected Route 3 or 3A stating traffic flow, good road links and avoiding residential areas as their main reasons.
Initial analysis seems to indicate that Route 3 was selected over Route 3A due to concerns about congestion at Ditton Roundabout with Route 3A. However, it is believed that this is due to the lack of detail in the map shown on the leaflet rather than any difference of opinion with the qualitative work conducted.

During the Stage 2 consultations, all focus groups and workshops decided that Route 3A was the preferred option.
13. LOWER COST NEXT BEST OPTION

The discussions above show that there is an undeniable and urgent need for a new crossing.

Consequently, it is considered that the lower cost option, in order to meet the requirement that it is “a credible scheme in its own right”, should be identified as the scheme that best appears to meet the appraisal criteria, but with some modifications.

A major part of the cost is in the crossing itself. A further direct effect on the cost is the number of piers in the estuary – less piers results in higher cost due to the increases in tower height and stiffness, although more piers in the estuary has undeniable environmental impacts.

Consequently, as Route 3A with medium spans (3 spans of 360m each) has been identified as the preferred option. A lower cost option would be the same route but with more spans and piers.

Therefore, the lower cost/next best option has been identified as Route 3A with short spans of 100m each.

An AST for this option has been prepared at Section 10.7 above.

The differences between this next best option and the preferred option is summarised in table 6 below:

<table>
<thead>
<tr>
<th>Span Option</th>
<th>Landscape</th>
<th>Biodiversity (operation phase)</th>
<th>Water Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferred Option</td>
<td>Medium Spans (360m)</td>
<td>Slight Adverse</td>
<td>Slight Adverse</td>
</tr>
<tr>
<td>Lower Cost option</td>
<td>Short Spans 100m</td>
<td>Moderate Adverse</td>
<td>Large Adverse</td>
</tr>
</tbody>
</table>

Table 6 Comparison of preferred route and next best option

(*) Cost includes Optimism bias Upper Band @ 66%

Both the preferred option and the lower cost option exhibit adverse environmental impacts. However the impacts with the shorter span options are, as should be expected, greater.

Table 7 is a comparison of the cost of the preferred option and the loss of benefits that would accrue as a result of the selection of the lower cost option:

<table>
<thead>
<tr>
<th>Span Option</th>
<th>Cost (*)</th>
<th>BCR</th>
<th>Loss of Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferred Option</td>
<td>£400m</td>
<td>3.298</td>
<td></td>
</tr>
<tr>
<td>Lower Cost option</td>
<td>£344m</td>
<td>3.837</td>
<td></td>
</tr>
</tbody>
</table>

Table 7 Comparison of Cost Saving and Loss of Benefits
As a direct result of the lower cost, the benefit to cost ratio (BCR) is significantly higher. The monetary economic benefits are identical in both cases.

However, it is considered that the additional degradation that would result from the provision of additional piers in the estuary does not warrant the selection of the lower cost option as the preferred option.
14. OPTIMISM BIAS

The *Supplementary Green Book Guidance*, published by HM Treasury, has been used in deriving the appropriate adjustment factors for optimism bias to be used for the New Mersey Crossing project as set out below.

The New Mersey Crossing is clearly a Civil Engineering project, but it is necessary to establish whether the project falls in the category of "standard" or "non-standard".

A project is considered non-standard if it satisfies any of the following conditions:

- *It is innovative*

The structure is unusual in being a multi span cable-stayed bridge however there are a number of examples of these structures throughout the world:

<table>
<thead>
<tr>
<th>Bridge</th>
<th>Number of Spans</th>
<th>Span Length</th>
<th>Total Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millau Viaduct, France (under construction)</td>
<td>6</td>
<td>342m</td>
<td>2052m</td>
</tr>
<tr>
<td>Rion Antirion, Greece (under construction)</td>
<td>3</td>
<td>560m</td>
<td>1680m</td>
</tr>
<tr>
<td>General Rafael Urdanetta Bridge, Venezuela</td>
<td>5</td>
<td>235m</td>
<td>1175m</td>
</tr>
<tr>
<td>NEW MERSEY CROSSING, HALTON</td>
<td>3</td>
<td>360m</td>
<td>1080m</td>
</tr>
<tr>
<td>Ting Kau Bridge, Hong Kong</td>
<td>2</td>
<td>475m</td>
<td>950m</td>
</tr>
<tr>
<td>Mezcala Bridge, Mexico</td>
<td>2</td>
<td>312m</td>
<td>624m</td>
</tr>
<tr>
<td>Arena Viaduct, Spain</td>
<td>5</td>
<td>105m</td>
<td>525m</td>
</tr>
<tr>
<td>Kwang Fu Bridge, Taiwan</td>
<td>2</td>
<td>134m</td>
<td>268m</td>
</tr>
<tr>
<td>Colindres Bridge, Spain</td>
<td>2</td>
<td>125m</td>
<td>250m</td>
</tr>
</tbody>
</table>

*Table 8 Multi-Span Cabled Stay Bridges*

The proposed forms of construction on the New Mersey Crossing are therefore not considered to be innovative – the main spans are, as indicated above, likely to be cable stayed with a maximum span of 360m.

- *It has mostly unique characteristics*

The characteristics of the New Mersey Crossing are not considered to be unique. It is a reasonably standard structure, although it is of a higher than usual length.

- Construction involves a high degree of complexity and/or difficulty

The construction of the New Mersey Crossing will involve some difficulties including construction over a tidal estuary of ecological importance and some construction on brownfield sites. Nevertheless, these issues are considered to be within the scope of standard civil engineering.
capabilities. Consideration has also given to the projects listed in Mott MacDonald’s report “Review of Large Public Procurement in the UK” which provided the data on which the Green Book Guidance is based. Only one major bridge project was included in the data and this was the Second Severn Crossing – it is similar to the New Mersey Crossing in a number of respects i.e. the form of structure, construction over an estuary and the fact that it was constructed as an alternative to an existing crossing with tie-ins to existing roads. The Second Severn Crossing is listed as a standard civil engineering project in the Mott Report.

In view of the foregoing, it is considered that the New Mersey Crossing does not meet any of the conditions for a non-standard project; it appears that the project meets the criteria for a Standard Civil Engineering project.

Despite this, the following was expressed as the view of the DfT in consultation on this project

“Our opinion is that the scheme should be classified as non-standard. This is the largest LTP road scheme with some difficult issues still to be resolved. However, it will suffice if you provide BCRs and TEEs using both classifications so we can see the sensitivity of the scheme to the choice.”

Consequently, the scheme will be assessed against criteria for both standard and non-standard projects.

The recommended adjustment ranges for Standard and Non-Standard Civil Engineering projects are:

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Non-Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Works Duration</td>
<td>Capital Expenditure</td>
</tr>
<tr>
<td></td>
<td>Upper</td>
<td>Lower</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>1</td>
</tr>
</tbody>
</table>

*Table 9 Adjustment Ranges for Standard and Non-Standard Projects*

The percentage contributions of the contributory factors for standard civil engineering projects (Table 3 of the Supplementary Green Book Guidance) are considered to be more appropriate to the New Mersey Crossing than those given for non-standard projects.
15. RISK ASSESSMENT

15.1 Methodology - Identifying the risks

A number of appraisals of the project have already been carried out. These include, for example, studies of financial viability, environmental impact, construction methods and geotechnics. The studies vary in depth and detail, and in the extent to which they consider “what may go wrong” as well as the costs and benefits of the project if it progresses as intended. It is proposed that, following an initial review of these studies to establish what is already known about risk, and where there may be gaps, a brainstorming session will be held between representatives of all the key areas of expertise in the project team. The session will review the risks already identified and identify any others that could impact the success of the project in meeting government policy and objectives.

The session will be structured to ensure comprehensive consideration of all types of risks associated with the project (e.g. financial risk, construction risk, environmental risk, risks arising from the timing of critical activities) arising at each stage in the lifecycle.

For each identified risk, the participants will be asked to identify potential outcomes, and any existing or planned processes by which these risks are controlled (mitigations). This information will form the basis for initial Risk Register. Risks, outcomes and mitigations will be identified at a relatively high level, appropriate to the overall decision-making process that the assessment is intended to inform. The session will focus on identifying major risks to the project, especially those that result from interactions between the various stakeholders and their objectives and activities. A group session is important because such interface risks may not be evident from specialist studies in isolation.

Having identified the risks, a high-level risk-ranking exercise will be carried out within the session. Any risks that can confidently be assessed as insignificant will be screened out, reducing the number that need to be considered further. It will also provide an initial picture of the priority areas for attention.

15.2 Quantifying the Risks

For each of the significant risks, additional, quantitative, information will be required on the likelihood of the risk occurring, the severity of each potential outcome, and the probability of each
outcome. Some information will be available from the existing studies, and some from other documentation. (e.g. historic analyses of similar projects). However, it is almost inevitable that subjective judgement will be necessary for many parameters, for which no robust, relevant objective data exist. Data elicitation sessions will therefore be organised with the participants from the original brainstorming session, and/or other domain experts as appropriate. Recognised formal data elicitation techniques will be applied to ensure that the best use is made of expert experience and judgement, and that areas of uncertainty or bias are identified and, where possible, minimised. (This exploration of uncertainty and bias is different from, but complementary to the application of the Optimism Bias factors referred to specifically in the DfT guidance.)

15.3 Modelling

In order to obtain an overall assessment of the project risk in common (usually monetised) terms, it is necessary to combine the likelihood, severities and probabilities associated with each identified risk, taking into account the uncertainties in these estimates. A number of methods and models are available, each with advantages and disadvantages for different types of problem. The specific tools adopted will thus be dependent on the nature of information available, but at this stage it is envisaged that a stochastic (Monte Carlo) model, based on proprietary add-ons to Excel spreadsheets or project planning tools, would be appropriate. If necessary, project-specific software can be used to supplement such models. A number of packages and modules are already available in-house and have been applied to other project risk studies.

In essence, stochastic models run the necessary calculations many times, sampling from distributions of each input parameter (likelihood, severity, probability etc), in order to build up a picture of the output risk distribution.

15.4 Outputs

The outputs of the model can be analysed in many ways. Key output formats include the statistical distributions of measures of project viability, such as costs, benefits and NPV. In addition, the sensitivity of these results to the various input parameters can be established, using statistical tests and visualisations such as scatter plots. This sensitivity analysis allows priority areas for any further risk mitigation to be identified.

It is recognised that risk assessment should not be a ‘one-off’ activity – it must be part of a proactive risk management approach if the project is to be successful. The submission to DfT will therefore consider the sensitivities and adequacy of existing risks mitigation plans, and provide an outline plan for continued review and management of risks as the project proceeds.
16. SCENARIO AND SENSITIVITY TESTING

16.1 Preferred Option

The key identifiers in which to test for sensitivity are:

- Level of cost overruns at which the net benefits of the scheme are zero
- The level of timesavings at which the net benefits of the scheme are zero

In the case of the New Mersey Crossing, the benefits of the scheme compared to the cost are so great, that the project would need to almost triple in price before the cost overruns negated the net benefits of the project. This is an extremely unlikely situation and it is not considered, therefore, to carry out further substantial examination of this criterion.

A full assessment of the sensitivity of timesavings has been provided in the Transport Economic Efficiency Technical Report (TR25/01).

The economic benefit of the scheme is generated principally from travel time savings on the crossings, as a result of reduced congestion and delays.

16.2 Lower Cost Option

The lower cost option realizes greater economic benefits to the area than the preferred option. It is therefore considered to use the same approach to cost overruns as indicated above. No further analysis will be undertaken on cost overruns as the sensitivity of this is considered to be minimal.

A full assessment of the sensitivity of timesavings has been provided in the Transport Economic Efficiency Technical Report (TR25/01).

The lower cost option provides an identical highway network to this preferred option, and hence generates the same level of timesavings.
17. APPRAISAL OF ALTERNATIVES

17.1 Park and Ride

Introduction

Park & Ride has the potential to divert some travellers from the use of the private car to public transport and has been suggested as a way of relieving congestion on the Silver Jubilee Bridge (SJB).

The elements that make for a successful Park & Ride scheme are set out in Government guidelines. These recommend that:

- an accurate assessment is made of the need for Park & Ride;
- that there is attractive car parking, and;
- that the scheme is effectively publicised

Studies carried out in the early 1990s have shown that for a successful scheme, several key factors are vitally important, such as the location of the car park site and the frequency of service. The P&R site must be as close as possible to the ultimate destination to enable a high frequency of service, keep fares low and minimise the non-car journey time.

But probably the most important factor is the car parking policy in the area being served by the scheme. A successful Park & Ride scheme introduced in York was accompanied by a package of measures to reduce traffic flows in the city centre. These included extensive pedestrianisation, access restrictions, parking controls and effective promotion.

Other key factors identified in studies include:

- vehicle comfort;
- the level of access at the car parks (walking distances, ramps, stairwells etc)
- the security of the car park and
- proximity of the set-down stops to the traveller’s ultimate destination.

The Effectiveness of Park & Ride

The ability of P&R to capture trips is limited to those drivers who have a choice as to which form of transport they can use. This excludes all commercial vehicles and light vans and people who use their car for work. Effectively, the target driver would be the commuter and shopper. However, a switch of some commuters to P&R would reduce peak hour flows on the bridge.

1 Department of Transport Guidelines on (bus based) P&R schemes (1991)
2 Capturing the Car User – The Potential of Park & Ride, PTRC 20th Summer Annual Meeting (1992)
3 Environmental transport policies: putting the theory into practice in York, Traffic Engineering & Control Vol 32 (1991)
Demand prediction methods for Park & Ride are not well established due to the many variables involved\(^4\). The maximum theoretical reduction in congestion in Newcastle city centre as a result of the Tyne & Wear Metro was predicted to be 9.3%.

However, it was found that reduction in traffic flows were compensated by the general increase in car ownership and the net effect of introducing P&R accounted for only one year’s traffic growth\(^5\).

Studies have also shown that shown:

- The majority of P&R users travelled very short distances and only 10% travelled more than 10 miles.
- There is a tendency for some users to be attracted from existing public transport services. A switch of between 10% and 26% of users from other forms of public transport has been noted.
- As many as 83% of users state parking charges in the city centre is their main reason for choosing P&R.
- Ease of access from the set-down point to the ultimate destination is vital.

**The Application of Park & Ride as a means of relieving the Silver Jubilee Bridge**

A survey has shown that traffic using the SJB is partly local and partly sub-regional. Local traffic - defined as trips between Runcorn and Widnes only - accounts for approximately 20% of all traffic. The majority of trips are between Halton and destinations outside the borough and trips with both origin and destination outside the borough.

P&R is most effective when applied to a single predominant destination. The most compact grouping of destinations shown by the survey is the Liverpool area comprising numerous sub-destinations and covering an area of some 200km\(^2\). This is far from ideal for P&R and would mean that potential users would be faced with long walks to their ultimate destinations.

Alternatively, to better serve as many destinations as possible, the P&R route would become too long and tiresome for potential users.

The application of Park & Ride as a means of relieving the SJB would therefore be aimed at capturing north bound commuters/shoppers originating in Runcorn and areas south of the Mersey having destinations in the Liverpool area. To be effective, therefore, the scheme would require the active and co-ordinated participation of a number of authorities in terms of parking policy, the introduction of complimentary measures and promotion of the scheme.

Two possible forms of P&R can be considered – bus based and rail based. A combination of both is also possible, but both systems would be competing for the same potential user.

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Rail Based Park and Ride

The existing rail system already supports a limited P&R scheme – Runcorn Station acts as a P&R to Liverpool and London, but scope for expansion is limited. The frequency of the existing service between Runcorn and Liverpool is too low to be effective for extensive and formal P&R, and would have to be increased.

A new station in Runcorn is proposed at Beechwood in this year’s Halton LTP submission. However, its remoteness from the town centre would make it an unattractive proposition for use as P&R.

A primary scheme in Halton’s rail strategy would be the introduction of bi-directional movements on the Halton Curve, thus providing a direct rail link to Chester. This would make it possible to utilise additional car park capacity at Frodsham, Helsby, Chester and other stations. However, the Strategic Rail Authority does not consider this proposal a priority.

Bus Based Park and Ride

There would appear to be adequate land available for a car park location south of the Mersey, particularly east of Runcorn. However, access to this area is not good and being some 6-7km east of the SJB would be less attractive to M56 traffic from the west.

The location of a P&R site in Runcorn is far from ideal in other respects, being over 20km from Liverpool city centre. The high fare coupled with the long journey time would be a strong disincentive to potential users and a large number of vehicles would be required to achieve an acceptable frequency of service. Furthermore, buses would have to cross the SJB at peak times exacerbating the congestion problems and resulting in little timesavings.

Conclusions

P&R has the potential to attract some drivers onto public transport and can be seen to be successful in many cases within the objectives that have been set.

However, capture can be relatively low in terms of overall traffic flows and the prospect of P&R significantly relieving the SJB, starting from this low expectation, is not good.

The destinations of potential users is dispersed, Halton is too far from any of these destinations for it to be attractive in terms of cost and journey time and most importantly of all, the imposition of a parking policy favourable to P&R over such a wide and diverse area would be extremely difficult to implement.

It is therefore concluded that a Park & Ride scheme would not significantly relieve the SJB.
17.2 Improvements to rail infrastructure

Introduction

Consultations carried out throughout this scheme raised the issue of whether an enhanced rail infrastructure has the potential to relieve the SJB by attracting both local and longer distance trips. This is also an important consideration of any integrated transport plan. The restoration of closed lines, the creation of new stations and the re-opening of some closed stations have been suggested. It is assumed that these improvements would be accompanied by the creation of new and more frequent services.

Possible Improvements

The Halton Local Transport Plan envisages rail having a crucial role in its integrated transport strategy. The strategy is to work with rail companies and surrounding local authorities to:

- seek improvements to services and stations;
- to promote the re-opening of closed lines;
- to protect certain potential station sites and closed lines from development, and;
- to encourage a shift of freight traffic from road to rail.

Implementation of many of the objectives of this strategy could attract trips from road to rail and therefore provide a degree of relief to the SJB. The objectives most likely to achieve this are as follows.

For passenger transport:

- a more regularly spaced service between Runcorn and Liverpool;
- a new Liverpool – Runcorn – Chester – North Wales service using the Halton curve;
- a new Hooton – Ellesmere Port – Runcorn East – Warrington – Manchester service timed to connect with the service above;
- improvement and expansion of station car parks, improved access for passengers, re-furbished buildings and shelters and better information and signing;
- the re-opening of the Halton Curve to two-way working for passenger traffic, connecting the Chester – Warrington line with the Liverpool branch of the West Coast Main Line (WCML);
- a new station at Beechwood to serve the re-opened Halton Curve;
- to improve bus/rail interchanges and encourage greater integration of services.
For freight transport:

- to support the aspiration of rail freight operators to increase by 80% the amount freight carried by rail in terms of tonne kilometres by allocating land for industrial use adjacent to suitable railway lines.

It is unlikely that the other objectives of the rail strategy would have a significant effect in attracting trips from the SJB.

Widnes South station would be located on the current Liverpool – Warrington freight route, which runs east – west north of the river and could not be accessed by trains between Liverpool and Runcorn.

Re-opening of Ditton station would only be viable if the density of its catchment area was to increase and therefore would not provide any relief to the SJB at this time.

The remaining objectives of the strategy relate to the Liverpool – Warrington line and the Chester – Warrington line east of Runcorn, which cannot be accessed by trains between Liverpool and Runcorn.

Potential Impact on the SJB of Implementing the Rail Strategy

The rail passenger transport strategy is based on a report by Mott MacDonald (August 2000) for Halton Borough Council. The report set targets for an increase in passenger numbers for stations within the Borough arising from implementation of the proposals, although the report points out that the rail strategy is constrained to some extent by factors outside the control of Halton Borough Council.

This is particularly the case with more frequent or added services, additional freight services and new stations that will be constrained by line capacity and the availability of train paths at Liverpool Lime Street station. The report estimated that passenger usage could increase by about 70% if all the strategy is put in place but recommended a target of only 50% as some elements rely on third party actions. As this analysis is taking a longer-term view, it would be reasonable to assume the most optimistic out-turn.

If this increase is applied to cross-river trips it would result in an additional 436 passengers daily using Runcorn station, representing a relief of nearly 900 vehicles per day on the SJB assuming return trips and single occupancy. However, WCML passenger usage would also increase under the strategy by nearly 600 passengers per day, a proportion of whom may be generated in Widnes and would use the SJB to get to the station.

The report only considers the impact on stations within Halton but the implementation of some elements of the strategy would have an impact on a much wider area. The re-opening to passenger traffic of the Halton Curve would restore the connection to Liverpool for trains to Chester and North Wales and potentially capture trips from Frodsham and Helsby.

The traffic survey showed that about 7% of trips over the SJB per day are generated from these areas (about 6000 vehicles per day), but it would be most unlikely that all would divert to a rail service if available. Drivers may not live close to, or have reasonable access to a station and
there may not be adequate or secure parking available at their nearest station. In addition, many drivers would not have the choice of alternative transport as they use their vehicles in the course of their work. Some of the 6000 trips will be small delivery vans, small trade vans and journeys with several destinations. The likelihood is that the number of trips captured by rail as a result of the strategy would be considerably less than 6000 per day.

The largest single movement across the river is between Runcorn and Widnes. Unfortunately, the rail strategy is unable to have any impact on these trips, as there is no station on the WCML in Widnes. Should Ditton Station be reopened, it is located too far from Widnes to have any real and significant effects.

Heavy Goods Vehicles (HGV) make up about 14% of traffic crossing the SJB but not all of this traffic would be suitable for transfer to rail. Much of this traffic will have origins and destinations that are not served by rail, its journey may not be long enough or the payload too small to make rail a viable option.

The most likely candidate for transfer to rail is container traffic and this is generally carried by the larger HGV (OGV2). This class of HGV comprises 4-axle rigid vehicles, articulated vehicles or HGVs with trailers and make up about a half of all HGVs and accounts for about 6000 vehicles per day on the SJB. Not all vehicles in this class carry containers and not all container traffic would be suitable for transfer to rail for the reasons given above. The likelihood is that rail would attract considerably less than 6000 trips from the SJB.

Conclusion

Clearly the implementation of Halton’s rail strategy has the potential to provide a degree of relief to the SJB. In the most optimistic scenario - that all possible trips transfer from road to rail - the relief could not be more than about 13000 vehicles per day.

In reality, experience shows that the transfer would be considerably less than the theoretical maximum and there would be insignificant relief provided to the SJB. Even the most optimistic scenario would fail to reduce traffic levels on the SJB to anything like acceptable levels. The much needed maintenance and refurbishment would not be possible and there would be a return to current traffic conditions in a matter of 5 to 10 years.

17.3 Light Rail

The Select Committee on Environment, Transport and Regional Affairs Eighth Report was prepared to consider Light Rapid Transit Systems. The Committee is appointed to examine the expenditure, administration and policy of the Departments of the Environment and Transport.

The report found that the principal benefit claimed for LRT is that it offers an attractive alternative to the car, and thus can help to limit traffic congestion and reduce environmental pollution, particularly when it is introduced in conjunction with additional traffic restraint measures.

There are many examples of light rail's ability to achieve modal shift. Almost one-fifth of the passengers using the first phase of Manchester Metrolink, for example, had previously made their journey by car and Metrolink was believed to have removed 2.5 million car journeys from the roads each year. Traffic volumes on the main radial routes into Manchester running parallel to the
light railway fell by between two and eight per cent. While such changes are small in absolute terms, they have had a significant impact on congestion on the roads affected.

In most cases, however, a much larger proportion of light rail passengers have previously made their journeys by another form of public transport than have transferred from their cars. In the case of the South Yorkshire Supertram, around 57 per cent of passengers had previously used buses. Another 7.6 per cent of passengers had made their journeys on foot or by bicycle and almost 10 per cent were using light rail to make new trips.

Essentially, public transport is effective where a large number of people wish to travel along the same route. It is therefore well suited to commuter routes in urban areas, and to well-travelled inter-city routes. Examples of successful modern urban transport systems include the Manchester and Sheffield Tram systems, which have been genuinely popular in attracting commuters.

Merseytram

On 10th December 2002, MerseyTravel was given approval for Line 1 of the Merseytram project when Ministers approved £170 million towards the costs of the new £225 million scheme. The remaining funding will come from local public and private sector backers and the European Union.

Merseytram is a 3-line network:

- Line 1 linking Liverpool City Centre to Croxteth/ Kirkby;
- Line 2 to Page Moss/ Prescot; and
- Line 3 to Speke/Garston and Liverpool John Lennon Airport.

Line 1 of Merseytram will also provide direct access to many of the 56,500 new jobs being created as part of the European Union's Objective 1 regeneration programme. Many of these will be in the major developments being planned in Liverpool city centre, and in the Approach 580 Strategic Investment Area in Croxteth/Kirkby. As part of MerseyTravel's integrated transport policies, Merseytram will also provide direct connections with regional and national rail services at Lime Street Station, Merseyrail at Lime Street and Moorfields, buses at Queen Square and Paradise Street bus stations, and the Mersey Ferries at the Pier Head.

The Merseytram Loop will provide new, easy and convenient ways of travelling to, from and around Liverpool City Centre and will serve all the key sites – the Waterfront including the Albert Dock and Pier Head; the Cultural Quarter including St George's Hall and Liverpool Museum; the Empire Theatre; the heart of the main retail area; the Commercial District and new city centre apartments.

Line 3 would provide a high quality link between the Borough, Liverpool Airport and on towards Liverpool and will greatly assist in promoting sustainable travel in these areas.
Role of the New Mersey Crossing

The New Mersey Crossing has an integral role to play in the provision of the Merseytram system to Halton. Although not a part of the current plans, it is thought that MerseyTravel will propose a future extension of the system into Widnes. Furthermore there would, with careful planning, be scope to further extend the LRT into Runcorn.

It is therefore essential that the considerations of the crossing take into account the possible future needs of the LRT. Conversely, the needs of the LRT may have an impact on the design of the crossing.

Potentially, two routes would be available to extend Merseytram into Runcorn following construction of the crossing:

- The route of the new crossing
- The existing SJB

From an initial inspection of the bridge, it is thought that the SJB is not a viable option to carry the light rail system. It is thought that the deck is too shallow to carry rails and that the bridge itself cannot take any further dead load. However, this does need to be the subject of a detailed design process.

If this is the case, then the new crossing presents an opportunity to extend the Merseytram into Runcorn where none presently exists.

This report does not cover the social or economic benefits of Merseytram, nor does it consider the preferred route for such a project. However, the two routes available will be sufficient to allow MerseyTravel to extend the network to Runcorn, should it be deemed necessary in the future.

17.4 High Occupancy Vehicle Lanes

High Occupancy Vehicle (HOV) lanes extend the use of with-flow (and potentially contra-flow) bus lanes to other vehicles, which make more effective use of scarce road space. These can include car sharers, taxis and commercial vehicles.

Trials of this in an arterial corridor in Leeds since 1998 suggest traffic flows had fallen by around 14%. Average car occupancy in the morning peak has risen from 1.35 to 1.41 for the road as a whole, and 2.19 for the HOV lane.

Experience elsewhere has suggested that HOV lanes can provide greater benefits than conventional bus lanes, provided that the delays to buses are not great. The bus operators in the Leeds scheme have reported timesavings of 3-6 minutes along the 1.5km HOV lane section.

New HOV lanes in South Gloucestershire have resulted in a 12% shift in the proportion of single occupant cars to car sharers.

In general terms, a major difficulty of HOV lanes is the likelihood of sole drivers illegally using such lanes, given what is perceived as a low risk of being fined. This system would require heavy
policing, the introduction of CCTV cameras and extensive infrastructure works where the HOV lanes merge into normal traffic flows. Further options could include tolling the SJB, but making HOV lanes free-of-charge.

The HOV scheme could be extended from the SJB in both directions to the point where congestion begins. The HOV lanes would be continued across the SJB to carry HOV vehicles in the dedicated lane to the opposite side of the river.

A direct comparison between the Leeds scheme and a similar scheme in Halton could not be accurately undertaken however, as the destinations of trips in Leeds are more confined than those of drivers who currently use the SJB.

However, specifically considering the SJB, an increase in car occupancy would be beneficial. Taking the reduction in traffic flows observed in Leeds of 14% would reduce traffic by around 11,000 vehicles per day. This would return traffic flows to their 1990 levels, and would be likely to return to current levels within 5 years or so.

17.5 Public Transport (Buses)

Throughout the preparation of the Local Transport Plan, Halton have considered a wide range of ways in which the public transport system of Halton may be improved to provide an alternative for those commuting by car within and through Halton, thereby obviating the need for a new crossing.

The key to encouraging greater public transport usage is quality co-ordinated information. The cornerstone of the Council’s information provision is the production, twice yearly, of the area travel guide. The Council are now fully participating in Passenger Transport Information (PTI) 2000 with a telephone information system operating 08:00hrs to 20:00hrs daily, funded by Halton Borough Council, Warrington Borough Council, Cheshire County Council, and bus operators. An internet information site is also available.

Further key improvement measures include an obligation on the Council to:

- Actively promote the use of the bus as a key feature of an integrated sustainable transport network
- Work with operators to develop high quality bus services and complimentary facilities (infrastructure improvements, Busway signal/junction improvements and new improved shelters), through regular liaison and formal quality bus partnership
- Continue to recognise the importance of the Runcorn Busway system as an integral part of the transport network, and will implement improvements to maximize its potential
- Provide socially necessary bus services that are not commercially viable, ensuring best value for money within available resources
- Ensure that potential for new and experimental services, including links where appropriate to new development, will be fully investigated and new initiatives implemented.
80% of traffic on the bridge is making trips across the region. 41% of all traffic movements are trips across the region but with either their destination or origin in the Borough of Halton. 39% of all traffic movements are using the bridge entirely as a through route across the region. Only about 20% of traffic movements across the bridge are purely local, i.e. between Runcorn and Widnes.

The National Travel Survey of 2000 revealed that the number of trips made by local bus has declined by over a quarter since 1985/86 when an average of 83 trips per year were made. However, the average length of a local bus trip increased by 17%, from 3.3 miles to 3.8 miles over this period.

The current public transport system is ill suited to many of the journeys currently made by car. Consequently, any improvements to the bus system must be made to those whose journeys start and end in Halton as it is unlikely that any major improvements to the use of buses can be made to journeys over 4 miles and crossing the river.

To assess the likelihood of public transport improvements being able to mitigate fully against the need for a new crossing, it is necessary to set some ambitious targets for the increased use of the bus.

The Centres for Excellence initiative is designed to highlight good practice in local transport planning and encourage local authorities to share their experiences. The authorities responsible for 16 LTPs in England have been designated as Centres of Excellence (COE) on the basis of the LTPs and subsequent annual progress reports.

Typically, the targeted modal split for a COE is as follows (this data applies to York):

- Car 47%
- Cycle 21%
- Foot 17%
- Bus (including P&R) 8%
- Other 7%

Therefore, even with a target of 8% of journeys made by bus, this would result in a reduction in car journeys of only 7,000. In reality, this represents 6,000 vehicle movements and does not take account of existing travel by bus. Such a reduction would probably see traffic return to current levels in two or three years.

17.6 Conclusions

These appraisals have shown that the impact of even an high level of investment and an impractically ambitious programme of improvement to the existing public transport systems would have only very small impacts on traffic levels and congestion on the SJB.
<table>
<thead>
<tr>
<th>Method of Improvement</th>
<th>SJB Reduction</th>
<th>Vehicle Reduction</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park &amp; Ride</td>
<td>Minimal</td>
<td>(Unquantified)</td>
<td>Unlikely to have high take-up</td>
</tr>
<tr>
<td>Rail</td>
<td>13,000</td>
<td>14%</td>
<td>Unrealistically optimistic scenario</td>
</tr>
<tr>
<td>Light Rail</td>
<td>7,200</td>
<td>8%</td>
<td>Modal shift mainly from other public transport</td>
</tr>
<tr>
<td>HOV Lanes</td>
<td>13,000</td>
<td>14%</td>
<td>Based on Leeds CC scheme</td>
</tr>
<tr>
<td>Buses</td>
<td>6,000</td>
<td>6%</td>
<td>Total number of journeys – no allowance made for existing journeys by bus</td>
</tr>
</tbody>
</table>

**Table 10 - Summary of alternative measures**

Whilst the cumulative effect of these improvements may seem good, it should be recognised that the overall effect will be significantly less. It would be dangerous to double-count the traffic shift, for example, some journeys identified as being suitable for transfer to rail might well be also suitable for travel by bus.

Consequently, it is unlikely that any of these measures, taken individually or together, would provide any significant reductions in car journeys across the SJB. Any reductions that were achieved would be negated by background growth in traffic over a few years.
18. MONITORING AND EVALUATION

18.1 Overview

The monitoring process will focus on actual strategy performance against broad objectives and against other strategy objectives (if these are different) and involves collecting a series of snapshots over time.

Identifying appropriate indicators will reflect the priorities of Halton. Wherever possible, such indicators should make use of available data, and should be relatively easy to collect. However it is important to recognise that, for the purposes of strategy monitoring and the later stage of evaluation, an indicator is only appropriate if it genuinely links to the intended purpose of the objective.

One indicator will be chosen for each target in order to make the data collection and handling manageable. Too many indicators pursued with insufficient clarity about what they actually reveal will tend to lead to disillusion with the monitoring process.

The evaluation process requires a review of desired objectives to assess whether they have been achieved. Evaluation is complex and expensive and is therefore performed infrequently related to stages in the planning process. Ideally, the performance would be evaluated against the main objectives of the Mersey Crossing Group.

18.2 Environmental Management Plan

An Environmental Management Plan (EMP) describes the management systems and monitoring and auditing arrangements required to ensure the proper implementation of agreed mitigation measures and the verification of predicted environmental impacts for the proposed New Mersey Crossing development.

The overall purpose of an EMP is to enhance the effectiveness of the Environmental Impact Assessment process by providing a systematic and explicit approach for the specification, approval and implementation of environmental mitigation measures.

The EMP for the New Mersey Crossing will be issued in four parts to cover the various stages of the project:

Part 1 - Investigations and Surveys
Part 2 - Design
Part 3 - Construction
Part 4 – Operation

Identification of environmental issues requiring monitoring and evaluation will be an on-going process throughout the life of the project. Some issues that may require mitigation and/or monitoring have been identified in the environmental assessments and these will be discussed further with the relevant consultees prior to completing the Environmental Statement. Three such issues are:
18.2.1 Ecology

Halton Borough Council have produced a Draft Saltmarsh Management Plan to address a number of concerns regarding the impact of the new crossing on the ecology of the area. The Management Plan has been discussed with English Nature and the Environment Agency. Details of the plan can be seen in Technical Report B4027/TR16/01 – Consultations; the six objectives are:

1. Bring together areas of saltmarsh into single ownership, with the express purpose of nature conservation management
2. Introduce integrated saltmarsh management based on a system of conservation grazing
3. Habitat creation and monitoring within the saltmarsh to extend diversity
4. Increase visitor appreciation and interpretation of the area
5. Enhancement of nearby designated nature sites
6. Provide new uses to land that is located within the Upper Mersey Estuary wildlife corridor

18.2.2 Hydrodynamics

The Acting Mersey Conservator and Manchester Ship Canal Company have expressed concerns over the impact of the new crossing on the hydrodynamics of the estuary (for details see Technical Report B4027/TR03/01 - Hydrodynamics. Although it is proposed to carry out some further modelling of the estuary as part of the detailed design, some long term monitoring of the estuary will be required. This could be carried out by comparing aerial photographs, bathymetric surveys and information obtained from the tide gauges installed for this project.

18.2.3 Transport

Traffic flows on the new and existing crossings together with the main feeder roads will be monitored to observe changes in transportation patterns resulting from the construction of the new crossing.

18.3 Informal Monitoring

Of no less importance to the formal monitoring process identified above, the project will be subject to extensive informal monitoring.

The impact of the crossing will undoubtedly be monitored by local interest groups and the point at which degradation might occur will inevitably be notified.
18.4 PFI Funding Monitoring

A requirement of the PFI process is a continual monitoring of the objectives of the scheme to ensure the correct level of payment to the operator. For example, both the highway authority and the operator will monitor accident rates and traffic flows.

Additionally, the accident rate will continue to be monitored as part of the ongoing LTP review process.
19. PROCUREMENT AND FUNDING

19.1 Justification for pursuing as a LTP major scheme

This scheme is the only major scheme being put forward by Halton in their Local Transport Plan. It is of major national, regional and local importance, not only to resolve the transport problems of the borough, but also to act as a stimulus to the economic regeneration and urban renaissance of Halton.

This scheme is essential to meet the objectives of the local transport plan. The vision statement of the plan is:

“To develop safe, efficient and inclusive integrated transport systems and infrastructure that encourage sustainable growth and regeneration”

This simply cannot be achieved using strategies that do not include a new crossing in Halton.

The importance of the project has already been recognised by Government. In May 1999, the Parliamentary Under Secretary of State for Transport advised that the way forward was to pursue a new, sustainable crossing on an eastern alignment via the Local Transport Plan process, and also to ensure that the scheme was incorporated in Regional Planning Guidance. It is clear through the discussions in this appraisal that these strategies depend on the crossing project being completed. Halton have been working hard to fulfil the Minister’s suggestions that interim measures should be carefully considered. Many schemes have been implemented, most recently a casualty reduction scheme across the bridge itself.

This scheme has also been suggested as a possible candidate for PFI procurement and funding, and the following section discusses that in the context of the questions in Annex G of the LTP guidance. An initial examination of funding options was presented to the Department in the form of three briefing papers. One of these discussed funding via the PFI and an updated version of that paper is to be submitted with this appraisal. Halton are committed to further assessment of the PFI route should approval to the scheme be given.

19.2 Suitability for PFI funding

Government guidance indicates that PFI funding may be suitable for many local authority transport projects, and that authorities should be encouraged to look at the most effective means of delivery as part of their Best Value strategies.

There are five basic tests that should steer local authorities to an assessment of whether their project has the basic elements necessary for success in PFI procurement.

Capital expenditure

PFI may not be suitable for most projects with capital costs of under £10m.

Is the capital value of the project greater than £10m?
The value of the preferred route at between £291 million and £336 million significantly exceeds this threshold.

Service content

The legislative and accounting definitions of PFI transactions require that, subsequent to the completion of construction, the contractual requirements placed upon the operator must encompass a significant service element. This requirement should be for a substantial period such that the operator is effectively responsible for most of the whole life cost of the asset. For many transport projects, the maintenance and operation of the assets could provide the necessary service element (and including this within the project provides an incentive to the contractor to construct the asset to an appropriate standard.)

Does the project have a significant service component?

The project would be suitable for a Design, Build, Finance and Operate approach. The project could bring together the maintenance of the new crossing and the existing SJB (SJB).

Operator influence on design, construction and operation of projects

For a successful PFI project, it will usually be necessary for the private sector to be given the maximum flexibility to devise an effective design solution which meets the strategic objectives of the project whilst maximising value for money to the public sector as a whole.

Can the project requirements be defined in terms of desired outputs or outcomes rather than detailed designs of assets and services?

Under a DBFO approach, the operator could be given the flexibility to propose innovative design and construction methods. Management and operation could also be determined by the private sector in the context of performance standards set by Halton.

Performance Measurement

The technical definitions of a PFI transaction also require that the operator be reimbursed by reference to its success in delivering in full the intended outputs of the project. These outputs and, where possible, outcomes, need to be quantifiable and provide a clear indication of successful delivery. They must also be influenced by the actions and performance of the operator subsequent to the completion of the initial construction or installation period.

Are these outputs and outcomes dependent, in part, upon the performance of the operator throughout the life of the project?

Under a DBFO approach, the achievement of defined standards of road condition and availability will be clearly dependent on the performance of the operator throughout the concession period. Outputs can be readily measured in terms of availability of carriageways, road condition, traffic usage, and safety records.

Can the delivery of these benefits be measured sufficiently reliably so that they could form part of the basis for payment to the developer/operator of the project?
Payments could be made to the operator on the basis of these outputs, and each is readily measurable. Performance could be assessed using the following suggested parameters:

- Availability of carriageways – closure of lanes on the new crossing and on the SJB.
- Road condition – use of SCRIM, Deflectograph and TRACS surveys to measure achievement of defined standards for road condition, coupled with assessment of performance in more general management and maintenance of the road environment.
- Traffic Usage - shadow tolling payments made on the basis of vehicle numbers using the new crossing (perhaps with a weighting towards heavy goods vehicles and public transport) and reductions in vehicle numbers on the SJB.
- Safety records – by taking the two crossings as a “transport corridor”, interrogation of police accident data would provide before and after accident data, measured in terms of absolute numbers or against LTP target reductions.

Barriers to Market Interest

There may be major uncertainties surrounding a local authority transport project, which would be beyond the control of the developer/operator. Such uncertainties could have a detrimental effect on the level of market interest in the scheme, or the likely value to be obtained from PFI procurement.

*Are there significant factors which may deter potential PFI partners from bidding for the project e.g. likely strong opposition to the project / risk of major disruption from protestor action?*

This appraisal has outlined the extensive consultation that has taken place. There has been no significant objection to the project and the environmental assessments undertaken to date have shown the environmental impact will not be to an extent that it cannot be mitigated. The size of the project would be likely to attract substantial interest from the private sector.

*Does the success of the project depend on other projects or actions outside the control of potential PFI partners?*

The New Mersey Crossing, rather than being dependant upon other projects, is the stimulus behind the regeneration and economic growth of the region. The success of the scheme in economic terms is obviously dependent on a wide range of policy factors and economic circumstances. However, the successful completion of the scheme itself is only dependent on obtaining the necessary statutory approvals and funding.
20. PROJECT DELIVERY

The proposed New Mersey Crossing is a major civil engineering project of exceptional size, cost and complexity. Delivery of the project will be a serious challenge for the promoting authority. The Borough Council is fully committed to the delivery of the project and has prepared this outline strategy in order to demonstrate the steps it has taken to place itself in a position to confidently meet the challenge.

20.1 Background

The management of this project has been an excellent example of partnership working. In 1995, the Mersey Crossing Group was established to pursue a new crossing of the Mersey. It is chaired by Halton Borough Council and comprises the five Merseyside local authorities of Knowsley, Liverpool, Sefton, St Helens and Wirral together with Warrington Borough, Merseytravel, Cheshire County, the local Chambers of Commerce, English Partnerships and Peel Holdings.

The full Mersey Crossing Group is an informed and committed partnership acting as a Steering Group where all local authority partners are represented at senior member level. Gifford and Partners undertake day-to-day project management reporting to a core officer team made up of senior managers from Halton, Knowsley, Liverpool and Warrington councils.

The full Mersey Crossing Group receives regular progress reports and takes decisions on the direction of the project.

Expenditure over the first two years of the study, 2001/02 – 2002/03, reached £1.3M. Of this, £600,000 was funded through Halton’s special LTP allocation, Halton added a further £180,000 from internal sources and the balance was met through contributions from partners in the Mersey Crossing Group.

Expenditure is continuing through 2003/04 on project management, preparation of the Major Scheme Appraisal, preparation of the Environmental Impact Statement, hydrodynamic study of the preferred option, continuing consultation, continuing environmental monitoring, detailed design and preliminary consideration of statutory procedures.

A team of specialist legal and financial advisors has been brought together to assist the Mersey Crossing Group take the scheme forward to full acceptance. The cost of the preparatory work is expected to exceed £700,000 in 2003/04. Funding is being provided by Halton and its Mersey Crossing Group partners but elements of the work are being deferred pending the expected DfT decision letter in December 2003.

20.2 Delivery Strategy

The project will be delivered by a team of senior managers lead by the Chief Executive and supported by specialists from the engineering, legal and financial professions. The team is already in place under the title the New Mersey Crossing Procurement Group. The membership of the Group is as follows:

- Chief Executive
- Executive Director – Environment and Development
- Executive Director – Resources and Corporate Services
• Executive Director – Regeneration and Neighbourhood Services
• Operational Director – Highways and Transportation
• Operational Director – Planning
• Council Solicitor
• Head of PR

Specialist input is provided to the Group by a team of experienced practitioners in key disciplines:

• Gifford and Partners – their current provision of lead consultant and project management services will continue as representatives of the client.

• KPMG – have been on board with the project since 2000 and will continue to provide specialist financial services through the procurement process particularly if a PFI Business Case is required.

• Herbert Smith – this City law firm has recently been appointed to provide specialist legal advice on the procedural and financial procurement processes. They have extensive experience of transport infrastructure projects, of PFI/PPP schemes and of the Transport and Works Act procedures.

Herbert Smith have provided early advice that has enabled the Project Group to decide that the Transport and Works Act would provide the best procedural route for the Council to pursue the New Mersey Crossing project.

Supporting paper prepared by Herbert Smith is presented at Sections 21 and 22 below. The paper sets out an indicative timetable for delivery. Assuming a PFI funding route, it is expected that the TWA and procurement procedures would take two years to complete. This would mean that construction could start in early 2006 with completion by 2009.

A supporting paper prepared by Gifford and Partners on Early Contractor Involvement (ECI) is presented at Appendix E.

The Group will be augmented by a dedicated client side Project Manager with appropriate support. This will be quickly put in place as soon as a firm timetable for the scheme progress can be determined in light of the response from DfT to the Major Scheme Appraisal.

The relative advantages of procurement options are under active consideration including early contractor involvement and design, build, operate arrangements.

The Group provides regular progress reports to the Mersey Crossing Group.
20.3 Preparatory Costs

The costs of the statutory procedures are expected to be considerable and although will severely stretch the resources of Halton and its partners, the Council is committed to meeting this expenditure. As a demonstration of its commitment and willingness to contribute to the scheme, the Council will use its capital programme, potentially enhanced by prudential borrowing and continuing support of its partners, to meet the preparatory costs of the scheme. Once the scheme has been “fully accepted” a bid will be made for eligible preparatory costs in line with current guidance. This bid will be extended to include PFI related costs should that be the preferred funding mechanism.

Not withstanding this commitment, given the continuing budget implications of the scale anticipated on an authority of limited size, the Borough Council has included a bid in its 2003 APR submission for further assistance with preparatory costs in advance of full acceptance. The Borough Council will need to meet over £500,000 of the costs due to be incurred in 2003/04. The project would proceed in 2004/05 with continued environmental monitoring, more detailed hydrodynamic modelling, further site investigations and any additional investigations required by DfT. A contribution of £300,000 towards this expenditure has been sought. This would be in line with the special allocations made in 2001/02 and 2002/03, but not include procedural costs nor the costs related to a PFI funding application.

20.4 Proven Delivery Capability

Since 1974 and more particularly since achieving Unitary status in 1998, Halton Borough Council has achieved a proven track record of delivering a wide range of major capital projects. The Council has been instrumental in delivering major town centre regeneration schemes in both Widnes and Runcorn. Partnership working with both Peel Holdings (Manchester Ship Canal Company) in Runcorn and with St. Modwen in Widnes have been important features of these regeneration schemes.

Major works currently underway include an Arts Centre (The Brindley) in Runcorn and two major retail / leisure developments in Widnes. The Economic Development Zone on Widnes Waterfront and the Castlefields Regeneration are at the Master Planning stage. In addition, proposals for the new Ditton Strategic Rail Freight Facility supported by the Strategic Rail Authority have been the subject of detailed discussion during the recent UDP public inquiry and attention is now being turned to the detailed Master Planning requirements.

The Council also has a long and successful record of implementing major and complex brownfield regeneration schemes and is currently engaged in the remediation of Wigg Island (Runcorn) and the former Coal Stockyard (Widnes) whilst negotiations with English Partnerships about the regeneration of the West Bank Dock Estate are proceeding.

In summary, over a period of 30 years, Halton Borough Council has promoted and delivered a range of major development and infrastructure improvements. The phrase "on-time" and on budget" is built into the culture of those tasked with delivering major schemes. Engagement with experienced, competent, responsible and committed partners enables the Borough Council to promote the New Mersey Crossing with a confidence that it will be able to deliver this vital scheme following support in principle from the Secretary of State.
21. TRANSPORT AND WORKS ACT APPLICATION

21.1 Statutory Authority

Because construction of a bridge in and over the River Mersey will interfere with public rights of navigation, statutory authority is required for the works. The grant of powers allowing interference with navigation will be the key consent, upon which all subsidiary consents will be based. Briefly, there are three routes by which this can be achieved:

- Act of Parliament – obtained via a Private or a Hybrid Bill
- Section 106 Highways Act 1980
- Transport and Works Act 1992 (“TWA”)

One of these routes must be used, because there will be inevitable interference with navigation by the construction of a structure in and over the navigable waters of the River Mersey, the Manchester Ship Canal and the Duke of Bridgewater’s Canal. The various processes would each be able to confer the appropriate powers. Each of these is discussed below, along with a view as to its appropriateness.

21.2 Act of Parliament

Traditionally, works interfering with navigation have been authorised by an Act of Parliament. An Act would grant powers to interfere with navigation and could be used to authorise works to, and make changes to the regulation of, roads and highways as well as granting most of the other necessary powers and approvals that would otherwise have to be obtained separately. An Act can also confer powers of compulsory acquisition upon the person authorised to carry out the works. As such, an Act of Parliament would allow the Council to promote the scheme. It would also confer planning permission by way of permitted development rights.\(^6\)

However, where an Act is promoted by a person other than the Government it must be petitioned for in the form of a Private Bill. In enacting a Private Bill, a statement must be contained in the preamble to the Act that the matters to which it relates cannot be achieved without the authority of Parliament. This must be proved before the committee on the Bill in both the House of Commons and the House of Lords. If another means to achieve the purposes of a Private Bill exists, this must be pursued. For the reasons given below in relation to the TWA process, it appears to be the case here that an alternative means exists. Nothing has come to our attention to date in relation to the New Mersey Crossing that suggests a Private Bill is required.

Hybrid Bills are used for schemes that affect private interests but that Government recognises are of wider public significance. An example is Channel Tunnel Act 1987 and the (failed) Crossrail Bill in the 1990s is another example. Schemes such as the New Mersey Crossing would not in our view, meet the criteria for a Hybrid Bill. It should also be recognised that the Hybrid Bill procedure is subject to the usual vagaries of parliamentary procedures and (unlike Private Bills) can lapse if

\(^6\) Part 11 of Schedule to the Town and Country Planning (General Permitted Development) Order 1995.

\(^7\) The promoter of a Bill must swear an oath in each House of Parliament that the purposes of the Bill cannot be achieved without the authority of Parliament.
not passed in the same session of Parliament or held over under the parliamentary rules. Procedural risk is therefore relatively high.

Even if we are wrong on the hybridity point, the Borough Council would need to persuade Government to devote resources and parliamentary time to any Hybrid Bill. Unless this process of persuasion is already underway (including convincing the parliamentary authorities on the hybridity point), this route even - if available - seems unlikely to be successful within the programme envisaged by the Council.

21.3 Section 106 Highways Act 1980

This provision allows the Secretary of State for Transport to authorise the construction of a bridge over navigable waters by a scheme made under this section. As well as a scheme for a bridge the authorisations/consents/powers noted below would need to be dealt with, but they would have to be dealt with separately under their own distinct procedures.

- Compulsory Purchase Orders;
- Application for Planning Permission;
- Coast Protection Act 1949 Consent;
- Consent of the Mersey Conservator;
- Stopping up Orders;
- Road Closure Orders
- Consent from the authorities for the Manchester Ship Canal, the Mersey Docks and Harbour Board, the Duke of Bridgewater’s Canal and Network Rail.

It is clear that the number of separate authorisations in this route – and possibly the number of separate inquiries if for timing or other reasons they are not conjoined – make it very unwieldy. As a result of the number of separate processes the procedural risk is relatively high: the more processes, the greater the risk of different/conflicting outcomes from each process, challenge or delay. Over and above procedural risk, this route is likely to result in delay and increased cost. In our view this is not an appropriate route for an application in respect of a scheme as complex as the New Mersey Crossing.

21.4 Transport and Works Act 1992

The TWA was introduced specifically to obviate the need for Private Bills. A TWA Order may authorise construction of works interfering with navigation, including a bridge\(^8\). It may also go further and permit matters that are also available under a Private Bill such as compulsory land acquisition, alterations to and stopping up of highways, the transfer of undertakings (in the case of PFI/PPP) and tolling. The TWA procedure also allows deemed planning permission to be

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8 Section 3 Transport and Works Act 1992 and the Transport and Works (Description of Works Interfering with Navigation) Order 1992 S.I. 1992/3230. This Order was amended by S.I. 1997/2906 but those amendments are not relevant for the purposes of this paper.
granted under Section 90(2A) Town and Country Planning Act 1990 at the same time as the TWA Order is made. The TWA procedure also allows various statutory provisions to be applied or disapplied, conflating them into a single process. This will apply to legislation, including:

- the Coast Protection Act 1949; and
- the consent of the Mersey Conservator under the Act of 1842.

The interests of such statutory bodies are protected by inclusion of specific provisions in the TWA Order. These provisions are typically developed by negotiation with the relevant bodies: in default the Secretary of State, on the advice of the DfT and his inspector, will settle the terms of any protective provisions. In return for these sorts of provisions the TWA process enables a scheme’s promoters to acquire land compulsorily from such bodies and to disapply or modify their legislation.

The TWA procedure requires that all statutory undertakers, landowners and other important bodies be notified of a TWA application that seeks to acquire land compulsorily from these sets of bodies and/or to disapply or modify their own legislation. This would apply to:

- the consent of the Mersey Docks & Harbour Board;
- the consent of the authorities for the Manchester Ship Canal and the Duke of Bridgewater’s Canal; and
- the consent of Network Rail for works to railway lines.

As in the case of other application processes the TWA procedure requires that an Environmental Statement must accompany the application for a TWA Order. This should also, in the present case, provide suitable information for the Secretary of State to make an appropriate assessment of the effects (if any) upon the Mersey Estuary Special Protection Area. The compulsory powers in the TWA Order may also be applied to securing mitigation or compensation measures and the land upon which they should be provided, should this be necessary.

All of the above matters can also be covered by a Private Bill. As explained in section 2 of this note, however, the fact that the TWA procedure is available means that it is the TWA procedure that should be used.

21.5 Comparison

The unwieldy nature of the Highways Act 1980 route and the unavailability of the Private or Hybrid Bill route means that a TWA application is the recommended route for the application.

This should not be a surprising outcome. The TWA procedure was established specifically to avoid the use of parliamentary time and resources and to streamline the otherwise disparate consent processes so that all relevant parties, and all relevant issues, can be dealt with in a

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9 An Act for better preserving the Navigation of the River Mersey [30th July 1842 5&6 Victoria cap. cx.]
10 In accordance with the conservation (Natural Habitats &c.) Regulations 1994.
combined process so as to deliver what is in effect a unitary approval by means of a single TWA Order.

21.6 Timescale

Based upon the use of the TWA procedure, a (relatively conservative) programme for an application is likely to be as follows:

- Preparation of application documents including Environmental Statement - late 2003 (assuming work is already in hand);
- Application – late 2003;
- Objection period – six weeks;
- Decision by Secretary of State to hold an Inquiry – one month (four weeks);
- Time to inquiry – not more than twenty-two weeks from Inquiry decision in 6.1.4;
- Inquiry – (say) four weeks;
- Inspector’s report, based upon a four week inquiry – (say) ten weeks;
- Target for Secretary of State’s decision, based upon Government guidance – up to six months from inspector’s report – twenty-six weeks.
- The above gives a total timescale of some sixteen to eighteen months from the date of the application. Assuming an application in late 2003, this would allow for a TWA Order to be made in mid 2005.
22. PROCUREMENT PROCESS

In this section, we set out a description of the processes required and the work programmes in relation to the procurement process. At the end of this section we have included a chart that describes diagrammatically some of the information that we provide below. The description assumes that at least some element of private financing will be involved, though we recognise that financing is still at large as an issue.

We assume that in order that the benefits that the new crossing will deliver can be gained as early as possible the Council would like the project delivered as efficiently as possible. We have therefore proposed what might be described as an accelerated procurement process the purpose of which is to get from the request for the initial expressions of interest (the OJEC notice) to a signed concession agreement as quickly as possible. We will touch on an alternative approach at the end of this section.

22.1 Drafting the concession agreement

The first step in the legal process will be the production of the first draft of the concession agreement. This will be the key document. It regulates the relationship between the Council and the concessionaire and it is therefore important that a lot of thought goes into the commercial structure of the deal. The concession agreement needs to be ready by the time the invitation to tender is issued to the bidders and as the work can take several months it should be commenced well in advance of the issue of the OJEC notice. Our experience suggests that there will be time to produce the concession agreement whilst the statutory powers are being sought.

22.2 Issue of OJEC and responses from interested parties
(6 weeks)

The first stage in the procurement process of which bidders will be aware is the issue of the OJEC notice in the official journal. This is a notice that is in a relatively standard form. It will describe the project in broad terms and invite interested parties to contact the Council if they require further information. They have a period of approximately six weeks in which to do this.

22.3 Prequalification period
(4 weeks)

Once those people who have expressed an interest in bidding for the project have responded, there will be a prequalification period of approximately four weeks. At the start of this period those people who have expressed an interest will be sent further information regarding the project together with a prequalification questionnaire for them to complete. This will be a simple document the purpose of which is to weed out those entities that the Council does not wish to bid for the project. Bidders will have two weeks in which to complete and return this form to the Council and the Council will then have two weeks in order to evaluate the forms. At the end of this period the Council should be in a position to announce a shortlist of approximately four bidders.
22.4 Issue ITT and tender period
(16 weeks)

At the end of the prequalification period those bidders that have been included in the shortlist will be issued with the invitation to tender. This will describe the project in more detail and set out the basis on which the competition to become the preferred bidder will be undertaken. It will therefore describe matters such as the required output and the financial proposals that the bidder is required to submit. The bidders will be sent a copy of the draft concession agreement with the ITT and they will either be required to confirm that they accept the terms of the concession agreement or to provide a mark up to the Council. During this period there could be some meetings with the bidders at which they will have the opportunity of asking questions about the project.

At the end of the tender period the bidders will be required to submit their bids to the Council.

22.5 Assess tenders
(12 weeks)

Once the bids have been received the Council will have a period of twelve weeks in which to assess the bids. During this period there could be a series of meetings with the bidders in order to clarify aspects of the bid that are uncertain and also to improve the quality of their bids. At the end of this period a final preferred bidder should be selected.

22.6 Final negotiations
(12 weeks)

The final stage of the project prior to financial close is the final negotiation of the concession agreement and the other related documentation (such as the lenders' direct agreement and the sub-contracts) with the preferred bidder. This can be a very intense period during which those working on the project will have to devote a lot of time to achieving financial close.

At the end of this period once the concession agreement has been signed and the various conditions precedent to the concession agreement becoming effective have been satisfied, financial close will have been achieved and the project will then be into its construction phase.

22.7 An alternative approach

The approach described above can be described as an accelerated approach. This approach will necessitate a lot of front-end work in order that the Council can be confident that the proposal being put to the market is what the Council wants delivered. It allows little scope for variations to the proposal throughout the procurement process. There could therefore be merit in going for an alternative approach that allows more time for schemes to develop.

Such an approach could be to structure the competition so that the shortlist of four is reduced to two and then to one rather than directly from a shortlist of four to a preferred bidder. This would permit a further stage in the procurement process where the Council will be working with two bidders. Such an approach can give rise to proposals being better developed and therefore improved. This can improve the quality of the project overall.
APPENDIX A

SUMMARY OF MERSEY CROSSING FEASIBILITY STUDIES
### Summary of Mersey Crossing Feasibility Studies

<table>
<thead>
<tr>
<th>Study Title</th>
<th>Date</th>
<th>Client</th>
<th>Consultant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Second Runcorn-Widnes Bridge – Initial Feasibility Report</td>
<td>Feb ‘78</td>
<td>Cheshire CC</td>
<td>Mott, Hay Anderson</td>
</tr>
<tr>
<td>Concluded that a bridge alongside the existing structure in the Runcorn Gap is feasible.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mersey Crossing Study Survey Report</td>
<td>April ‘92</td>
<td>Dept of Transport</td>
<td>Transport Planning Associates</td>
</tr>
<tr>
<td>Mersey Crossing Study – Final Summary Report</td>
<td>Sept. ‘93</td>
<td>Dept. of Transport</td>
<td>Oscar Faber TPA</td>
</tr>
<tr>
<td>Looked at a wide range of options within a 3km corridor either side of the Jubilee Bridge but although the COBA analysis was positive the Government concluded that the high cost and environmental issues could not justify a new strategic trunk road crossing.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mersey Crossing Study – Stage 1 Report</td>
<td>June ‘97</td>
<td>Mersey Crossing Group</td>
<td>Oscar Faber TPA</td>
</tr>
<tr>
<td>On the advice of Minister this looked at local options and identified three routes for further study that would meet the transport objectives, on-line, eastern and western.</td>
<td></td>
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</tr>
<tr>
<td>Stage 2 Environmental Assessment for New Mersey Crossing</td>
<td>March ‘98</td>
<td>Mersey Crossing Group</td>
<td>RPS (for Oscar Faber)</td>
</tr>
<tr>
<td>Looked at environmental impact of all local routes. Effectively ruled out all western routes, preferred the on-line route but recommended more work on the eastern option.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Economic Impact of New Mersey Crossing</td>
<td>March ‘98</td>
<td>Mersey Crossing Group</td>
<td>DTZ Pieda (for Oscar Faber)</td>
</tr>
<tr>
<td>Confirmed economic benefits arising from a new crossing that could lead indirectly to the creation of up to 17,000 new jobs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic Impact of Second Runcorn Bridge</td>
<td>Sept. ‘98</td>
<td>Mersey Crossing Group</td>
<td>Liverpool Macroeconomic Research</td>
</tr>
<tr>
<td>Concluded that an eastern alignment would yield the most benefits quantified at over 5,500 jobs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Mersey Crossing Study – Stage 2</td>
<td>March ‘99</td>
<td>Mersey Crossing Group</td>
<td>Oscar Faber</td>
</tr>
<tr>
<td>The study recommended a central route threaded between the existing road and rail bridges as the cheapest option that would provide relief to the Silver Jubilee.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Mersey Crossing at Runcorn – Review of Options</td>
<td>June ‘99</td>
<td>Halton Borough Council</td>
<td>Mott MacDonald</td>
</tr>
</tbody>
</table>
Confirmed the feasibility of a low-level eastern alignment.

<table>
<thead>
<tr>
<th>Mersey Crossing Study – Integrated Transport Solution Volumes One, Two and Three</th>
<th>May ‘00</th>
<th>Mersey Crossing Group</th>
<th>WS Atkins</th>
</tr>
</thead>
</table>

Full O & D survey and traffic model predicted that daily flows across the river would grow to 101,000 vehicles a day by year 2025. Would result in increasingly unstable flow conditions, congestion, accidents and regular gridlock. With a second bridge, unconstrained flows were predicted to rise to 112,000 vehicles a day. (Current avg. daily flows on M6 between West Midlands and the North West are 115,000).

Concluded that low level crossings in a 2km corridor east of the existing bridge are technically feasible and provide good value for money. The cost of the crossing would fall within a viable PFI range and would perform well in terms of traffic operation and economic development aims. The study highlighted that a crossing could have potentially adverse environmental impacts on the river and estuary and recommended further technical investigations.

<table>
<thead>
<tr>
<th>Mersey Crossing</th>
<th>Sept. ‘00</th>
<th>Halton Borough Council</th>
<th>KPMG</th>
</tr>
</thead>
</table>

Confirmed viability of a PFI funded scheme.
<table>
<thead>
<tr>
<th>NEW MERSEY CROSSING</th>
<th>CONGESTION REFERENCE FLOWS / RELIABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Flows</td>
<td>Do Minimum</td>
</tr>
<tr>
<td>SJB</td>
<td></td>
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<td>am</td>
<td>4460</td>
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<td>3911</td>
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<td>48296</td>
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<td>46517</td>
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<tr>
<td></td>
<td>46168</td>
</tr>
<tr>
<td></td>
<td>45405</td>
</tr>
<tr>
<td>Road Standard (or capacity as value)</td>
<td>Do Minimum</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Percentage HGV</td>
<td>%HGV</td>
</tr>
<tr>
<td>Maximum hourly lane throughput</td>
<td>CAPACITY</td>
</tr>
<tr>
<td>Traffic</td>
<td></td>
</tr>
<tr>
<td>Peak Hour Flow</td>
<td></td>
</tr>
<tr>
<td>Daily Flow</td>
<td></td>
</tr>
<tr>
<td>Daily Traffic 0.9 7day AADT</td>
<td></td>
</tr>
<tr>
<td>Weekday Traffic 5 day AAWT</td>
<td></td>
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<tr>
<td>Pkd</td>
<td></td>
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<tr>
<td>carriageway</td>
<td></td>
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<tr>
<td>Carriageway Width (per direction)</td>
<td></td>
</tr>
<tr>
<td>Number of lanes (per direction)</td>
<td></td>
</tr>
<tr>
<td>*If more than one lane - assumes dual Width Factor</td>
<td>Wf</td>
</tr>
<tr>
<td>Congestion Reference Flow</td>
<td></td>
</tr>
</tbody>
</table>
### Congestion Reference Flows to TA46/97 Annex D

<table>
<thead>
<tr>
<th>Road</th>
<th>New Mersey Crossing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do Minimum</td>
<td>Route 1</td>
</tr>
<tr>
<td>Road Standard (or capacity as value)</td>
<td></td>
</tr>
<tr>
<td>Enter value or S,D,M</td>
<td></td>
</tr>
<tr>
<td>Percentage HGV</td>
<td>%HGV</td>
</tr>
<tr>
<td>Maximum hourly lane throughput</td>
<td>CAPACITY</td>
</tr>
<tr>
<td>Traffic</td>
<td></td>
</tr>
<tr>
<td>Peak Hour Flow</td>
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<tr>
<td>Daily Flow</td>
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<tr>
<td>Pkf</td>
<td>#DIV/0!</td>
</tr>
<tr>
<td>Daily Traffic</td>
<td>0.9 7day</td>
</tr>
<tr>
<td>Weekday Traffic</td>
<td>5 day</td>
</tr>
<tr>
<td>carriageway</td>
<td></td>
</tr>
<tr>
<td>Carriageway Width (per direction)</td>
<td></td>
</tr>
<tr>
<td>Pkd</td>
<td></td>
</tr>
<tr>
<td>Number of lanes (per direction)</td>
<td></td>
</tr>
<tr>
<td>*If more than one lane - assumes dual</td>
<td></td>
</tr>
<tr>
<td>Width Factor</td>
<td>Wf</td>
</tr>
<tr>
<td>Congestion Reference Flow</td>
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</tr>
</tbody>
</table>
APPENDIX C

WIDER CONSULTATION
• Acting Mersey Conservator
• AEP Energy Services (Fiddler’s Ferry Power Station)
• British Trust for Ornithology
• British Waterways
• Butterfly Conservation
• Cheshire and Wirral Amphibian and Reptile Group
• Cheshire and Wirral Ornithological Society
• Cheshire Bat Group
• Cheshire Fire Service
• Cheshire Police
• Cheshire Wildlife Trust
• Council for the Preservation of Rural England
• Daresbury Parish Council
• Farming and Wildlife Advisory Group
• Fiddler’s Ferry Sailing Club
• Friends of the Earth
• Government Office North West
• Halton Chamber of Commerce
• Halton Transport
• Halton Wildfowlers
• Health and Safety Executive
• Highways Agency
• ICI
• Institute of Logistics and Transport (Merseyside and Warrington Branch)
• Lancashire and Cheshire Entomological Society
• Liverpool Chamber of Trade Port and Transport Group
• Liverpool John Lennon Airport
• Mersey Docks and Harbour Company
• Mersey Estuary Conservation Group
• Mersey Strategy
• Merseyside Ambulance Service
• Merseyside and West Lancashire Bat Group
• Merseyside County Museums
• Merseyside Transport Forum
• Network Rail/ Railtrack
• Northwest Development Agency
• North West Freight Advisory Group
• North West Naturalists Union
• Penketh Parish Council
• Railtrack
• RSPB
• Sankey Canal Restoration Society (SCARS)
• Strategic Rail Authority
• The Mersey Forest
• Vale Royal BC
• Warrington Local Agenda 21 Waste Group
• Wildfowl and Wetlands Trust
• Wirral and Cheshire Badger Group
APPENDIX D

SUPPORT FOR A NEW CROSSING
The following groups have all expressed support for the project:

- AHC Warehousing
- AMEC Developments Limited
- Anthony’s Travel
- Arriva North West
- BBC Radio Merseyside
- Biffa Waste Limited
- CB Hillier Parker
- Cheshire Constabulary
- Cheshire Fire Brigade
- Chester & North Wales Chamber of Commerce
- Confederation of Passenger Transport UK
- DATS (Holdings) Limited
- Ellesmere Port & Neston Council
- EVC
- Express Travel (Holdings) Limited
- Freight Transport Association
- Granox Ltd.,
- Greater Manchester Joint Transport Policy Team
- Greater Merseyside Enterprises
- Halton College
- Halton Constituency Labour Party
- Ineos Fluor
- Learning & Skills Council
- Liverpool Chamber of Commerce
- Liverpool Echo
- Liverpool John Lennon Airport
- Liverpool Housing Trust
- Liverpool Land Development Company
- Liverpool Walton
- Manchester Chamber of Commerce
- Maple Grove Developments
- Merseyside Constabulary
- Morbaine
- Network Strategy North
- NHS Logistics Authority
- North West Business Leadership Team
- Norwest Holst
- NWRA Key Priority Group
- O’Connors Transport
- RAC
- Road Haulage Association
- Runcorn Probus Club
- Speke Garston Partnership
- St. Helens Chamber of Commerce
- St. Helens RLFC
- Tarmac
- The Mersey Partnership
• Tibbett & Britten
• Towngate plc
• Vale Royal Borough Council
• Weekly News Group
• Widnes Vikings RLFC
• Wire FM
• Wm Morrison
• World Group Newspapers
APPENDIX E

EARLY CONTRACTOR INVOLVEMENT

(Paper by Gifford)
EARLY CONTRACTOR INVOLVEMENT

The submission of the Major Scheme Appraisal (MSA) document to the Department for Transport (DfT) provides the ideal opportunity to consider the ongoing strategy for the effective realisation of the project.

A traditional form of procurement for large infrastructure projects was for the promoter to commission an engineer to develop the scheme in sufficient detail to take it through the statutory process, prepare a detailed design, invite tenders and appoint a contractor to build the works. Forms of contract (in particular the ICE 5th and 6th versions) have been developed for use in such circumstances. They establish the positions of Employer, Engineer and Contractor and confer certain duties and obligations on each. For many years they proved effective but more recently have become discredited. Their adversarial style rewarded those looking to exploit contract conditions and led to escalation in cost between tender values and out-turn costs.

A solution in part has been seen in the popularity of Design and Build contracts. This form of contract transfers the design responsibility (and the majority of the risk) to the contractor. This is a logical development since, in many ways, it puts the construction risk in the hands of the party best able to manage it. The down side from the promoter’s point of view is that he also transfers control over the design process. All he can expect to receive is that that he originally asked for. No less – but no more. Thus if there is a need or a desire to amend or develop the design on the behest of the employing authority, this can only be effected through a variation to the contract and a process of negotiation.

Design and Build still requires the promoter of the scheme to enable it by taking it through the statutory process and obtaining consents. This can be a time consuming process. It also imposes severe conditions on the form of the scheme that limits the opportunity for design innovation by the tendering parties. Evidence given to an Inspector at a formal Inquiry can often become binding conditions within a report. Good ideas later can be too difficult to implement without having an adverse impact on the delivery programme.

A solution is being seen in bringing a contractor on board at an earlier stage in the process. Such early contractor involvement (ECI) is being used by the Highways Agency (and others) to realise their ambitious highway programme. By exploiting the skills of a contracting organisation during the scheme identification process, the HA are hoping to enjoy the benefits of D&B in defining the most economic scheme and have that scheme confirmed through the procedural process. Contractor choice is made on the grounds of quality (proven track record of delivery etc) and, perhaps, management fees/charges. Normally the scheme breaks down into logical phases. Scheme definition (and Inquiry if necessary) is one such stage and is when a sensible value can be determined with reasonable accuracy. A target price will have been established and can be reviewed. Pain/gain formulae are agreed and risks apportioned. Should negotiations fail the contract can be determined with the intellectual property rights being retained by the scheme promoter. But “failure” should be seen as being a failure by all parties. It illustrates a breakdown in the partnering philosophy that all should enter into and participate in. The prize promises to be the Holy Grail: an optimum scheme produced within a predetermined budget.

Is such an approach applicable to the New Mersey Crossing?
Early involvement of a contractor offers significant benefits:

- Buildability will be an important consideration within the design of the scheme. An experienced contractor brings the benefit of determining the actual proposed construction methodology.
- A contractor will be able to give firm pricing guidance and cost estimates.
- A contractor can contribute commercial knowledge to the decision making process.
- A contractor can offer input into the Risk Register and to the management of risk.
- A contractor will contribute to the development of the Health and Safety file.

In the case of the new crossing there are potentially other benefits in seeking the early appointment of a suitable contractor. On the assumption that approval of the scheme is forthcoming from Government, in order to progress the scheme through the further design investigations and statutory procedures will require a significant investment. The following is believed to form a reasonable schedule of monies required:

- Legal advice / TWA preparation £1 million
- Further design in more detail £500 thousand
- Further Ground Investigation £250 thousand
- Environmental Monitoring £100 thousand
- Environmental Statement £100 thousand
- Public Exhibition £100 thousand
- Public Inquiry £100 thousand (or more)

A total figure of £2.5 million is probably not unreasonable. This may be a difficult sum for a local authority to find without the full support of central Government.

A large enough contracting group would possibly see participating in such an investment as worthwhile provided they are identified as the preferred contractor. They would have the capacity to defer their recovery of these costs, under suitable terms, until the construction stage. They would accept the risk of the scheme ultimately failing at Inquiry if convinced of the very low likelihood of such an outturn.