MERSEY CROSSING STUDY - INTEGRATED TRANSPORT SOLUTION

FINAL REPORT - VOLUME 1 - EXECUTIVE SUMMARY

July 2000
MERSEY CROSSING STUDY - INTEGRATED TRANSPORT SOLUTION

FINAL REPORT - VOLUME 1 - EXECUTIVE SUMMARY

July 2000

WS Atkins Consultants Ltd
Television House, Mount Street, Manchester M2 5NT
Tel: (0161) 839 3113 Fax: (0161) 839 3137
MERSEY CROSSING STUDY – FINAL REPORT

THE REPORT IS PRESENTED IN THREE VOLUMES -

VOLUME 1 – EXECUTIVE SUMMARY

VOLUME 2 – MAIN TEXT

VOLUME 3 – TABLES, FIGURES, APPENDICES

CONTENTS OF VOLUME 1

EXECUTIVE SUMMARY

Introduction 1
Integrated transport study - brief 1
Issues under examination 1
Road transport context 2
Public transport context 3
Walking and cycling context 4
Planning context 4
Economic development context 5
Environmental context 5
The second crossing - principles 6
Potential eastern bridge locations 7
Public transport, walking and cycling links 7
Bridge form and cross-section 8
Assessment of bridge options 8
Ecological, river and navigation issues affecting all options 10
Air quality and noise issues - affecting all options 10
Funding mechanisms 11
Overall assessment 11
Scheme preference 12
Comparison with previous studies 12
Conclusions 14

Figures A, B, and C
Introduction

1. The Mersey Crossing Study Report consists of three volumes. This volume is the Executive Summary. The main text of the report forms the second volume, and the third volume includes the various tables, figures, and appendices referred to in the main text.

2. This Executive Summary sets out the main elements of the background to the study, key information, the issues which have been addressed, the development and assessment of schemes, and the conclusions reached.

Integrated Transport Study - Brief

3. Following on from a number of earlier studies which have investigated the case for additional highway capacity across the River Mersey, west of M6 at Thelwall, WS Atkins was appointed by Halton Borough Council, on behalf of the Mersey Crossing Group, to examine the issues in more detail. Halton Borough Council has expressed a preference for a new crossing to be located within the Borough, but to the east of the existing road crossing point (the Silver Jubilee Bridge) at Runcorn Gap. (See Figure A for a locational reference plan).

4. Our brief was to:
   - examine the case for New Crossing East of Silver Jubilee Bridge
   - carry out a more detailed examination than previous studies, with new transport data
   - identify potential schemes, in the context of an integrated approach involving public transport, walking and cycling
   - assess scheme effectiveness
   - prepare a robust transport case for inclusion in the Borough Local Transport Plan (LTP), and those of adjoining authorities, and
   - make recommendations for progressing proposals.

Issues Under Examination

5. During the course of the study we have examined a number of issues, including:
   - demand for movement across the river
   - public transport
   - walking and cycling
   - air quality and traffic noise
   - river issues - hydrology, ecology, navigation, and pollution
   - the planning & economic development context
   - scheme funding and finance
Road Transport Context

6. Surveys were carried out in November 1999 by the Oscar Faber consultancy on behalf of Halton Borough Council. Key findings resulting from our analysis of those surveys are:

- Total daily two-way flow using the Silver Jubilee Bridge is now almost 80,000 vehicles
- The strategic split of this traffic is:
  - Local (trip wholly within Halton) 16,000 (20%)
  - Sub-Regional (through trips – start and finish both outside Halton) 30,000 (38%)
  - Remainder (trips starting or finishing (but not both) in Halton) 33,000 (41%)
- The nature of the traffic crossing the river can be described as follows:
  - Halton Resident trips¹ 26000 (33%)
  - Halton Employee trips² 13000 (16%)
  - Halton HGV³ trips 3000 (4%)
  - Other HGV trips 4000 (5%)
  - Other trips (through, coaches etc) 33000 (42%)
  - HGVs constitute 9% of the flow
  - Halton residents and employees make up 49% of the flow
- Major District to District daily movements observed in the surveys are:
  - Runcorn to Widnes 16,000
  - Runcorn to Liverpool 10,000
  - Runcorn to Knowsley 4000
  - Runcorn to Warrington (north) 4000
  - Vale Royal to Liverpool 4000

Future Flow Levels

7. In order to ascertain the scale of crossing which we should be examining we prepared forecasts of future levels of demand for vehicular movement across the river in Halton. These forecasts took account of the DETR District Level trip end

1.1

1 Trips in which one trip end had a Halton address and a ‘home’ purpose.

² Trips (excluding ‘Halton resident’ trips) in which one trip end had a Halton address and a ‘work’ purpose.

³ Goods vehicles which start and/or finish their journeys in Halton
projections which form part of the National Road Traffic Forecasts, the constraining effects which congestion on the Silver Jubilee bridge might have on future traffic growth, and efforts to encourage a transfer from private car to public transport. We developed a range of forecasts for 2025 (which is assumed to be the ‘design’ year, fifteen years after a 2010 opening year for a new bridge). By 2025 we forecast that the demand to cross the river in Halton will have risen from 79,000 vehicles per day in 1999 to between 101,000 to 112,000 vehicles per day.

8. DETR guidance suggest that the theoretical free-flowing capacity of Silver Jubilee Bridge would be about 55,000 vehicles per day, we have thus assumed that a new crossing should seek to remove congestion by reducing the flow on the Silver Jubilee Bridge towards 55,000 vehicles per day by providing additional capacity, whilst encouraging non-private car modes. Given the level of flow which the second crossing would need to attract, a dual carriageway standard route is envisaged.

Public Transport Context

9. Approximately 72,000 people cross the Silver Jubilee Bridge each weekday. The vast majority travel by car. Of trips wholly within Halton, 16,000 movements take place by car, with bus services carrying 1800 passengers (of whom 450 have a car available). That is, 10% of bridge-crossing movements within Halton are by bus, and 2.8% of those with a car available for the trip travel by bus (the other 97% travelling by car.

Importance of Public transport

10. Encouraging and facilitating greater use of public transport is important for two main reasons -
- Increased use of public transport by car owners will help to limit private car congestion and pollution, and limit the scale of a new crossing.
- Increased availability of more attractive public transport by non-car owners should reduce perceived severance between Runcorn and Widnes and increase overall mobility

Mode Split Detail

11. The overall 10% share by bus for movements within Halton masks quite wide variations in public transport mode share for various movements.

12. In general a much higher bus mode share is achieved for trips starting or finishing in
- Runcorn High Street area
- Victoria Square/Town Hall area of Widnes

13. A much lower bus mode share is achieved for other trips starting or finishing in
- Halton Lea
Mersey Crossing Study Report – Volume 1

- Brookvale and Beechwood areas of Runcorn
- Widnes Town Centre
- Farnworth and Ditton areas of Widnes

14. We therefore concluded that schemes should seek to raise bus modal share for low share movements whilst protecting existing high share movements. The scheme can thus be expected to incorporate bus priority measures within its layout, and may also need to include positive public transport assistance at other locations in the Borough, effectively linking Widnes into the innovative Runcorn Busway system.

Walking and Cycling Context

15. Our qualitative assessment of the present situation is that there is -
- Limited use of current pedestrian facilities on the bridge
- The Silver Jubilee Bridge offers poor facilities for cyclists
- Linkages at bridge ends to the main attractors of pedestrian and cycle movements are fairly poor.

16. We have thus concluded that if a new crossing is to contribute to more sustainable transport modes, it should seek to improve walking and cycling facilities for leisure and non-leisure uses – by providing links to the Trans-Pennine Trail, Bridgewater Canal towpath, Widnes and Runcorn Centres, and the Astmoor Industrial Estate.

Planning Context

17. We have examined the various regional and local planning documents, including regional guidance, the Halton Local Plan, and draft Halton UDP. As regards cross-river movements and a new crossing, the key issues raised in these documents can be summarised as follows -
- There is a need for improved communication across the Mersey at Halton at a strategic/sub-Regional level and well as from a local planning viewpoint
- Multi-modal solutions should be sought for transport problems
- Future development should focus on the re-use of previously developed land and regeneration of derelict industrial land, with a particular emphasis on SE Widnes (where there are significant areas of this type of land available)
- A Special Development Opportunity exists in the Spike Island/Widnes Warth area on the north bank of the Mersey
- A Regionally important strategic business site has been allocated and is under development at Daresbury Park, east of Runcorn
- Major revitalisation of areas of south Liverpool (particularly the Speke-Garston area) is key to future policies in the region.
Mersey Crossing Study Report – Volume 1

18. From a planning perspective, therefore, any new crossing should seek to improve accessibility to regeneration areas and special development opportunities both in Halton and in the surrounding districts, particularly south Liverpool.

Economic Development Context

19. Our examination of the economic development context has lead us to conclude that
   - Congestion on the Silver Jubilee Bridge is perceived as detracting from a positive image
   - Improved accessibility may improve prospects for derelict sites
   - The employment and development market on the north bank is depressed (job losses and ‘difficult’ development sites are concentrated in Widnes, and there are few easy to develop sites)
   - There has been a buoyant level of activity on south bank – particularly at Astmoor, Manor Park, Daresbury Park, and the majority of more easily developed sites are located in Runcorn.

20. At a more strategic level, congestion on the Silver Jubilee Bridge is seen as a significant constraint on the extent to which major development areas, particularly in the Speke-Garston area of south Liverpool, and in southern Knowsley can be implemented, and the success which the regeneration initiatives in those areas can achieve.

21. A new crossing should thus aim to provide sufficient highway capacity to ‘unlock’ the full development potential of areas of southern Liverpool and Knowsley and, at a more local level, improve accessibility for Widnes residents to access Runcorn employment opportunities.

Environmental Context

22. There are four main areas in the environmental field to which specific consideration needs to be given in developing and assessing the impact of a new river crossing
   - Air Quality and Traffic Noise in West Bank and Runcorn Town – The Silver Jubilee bridge and approaches are located immediately adjacent to the West Bank residential area on the north bank of the river, and pass through the westerly section of Runcorn Town on the south bank of the river. The high traffic flows and peak hour congestion on the bridge create an environment of poor air quality and intrusive traffic noise in these areas. Whilst the high level of the existing crossing and screening introduced on the east side of the bridge approaches reduces noise levels to below those which qualify residential properties for noise insulation in connection with new highway schemes, noise levels at the West Bank Primary School are very high, and levels of a number of air pollutants are above target levels on both banks of the River.
Mersey Crossing Study Report – Volume 1

Contaminated Land issues on the Banks of the Mersey – There is a long history of chemical production and tipping of waste materials on both banks of the river, particularly north of the St Helens Canal, and on Wigg Island and close to the Manchester Ship Canal. Some areas are heavily contaminated.

Ecology and Nature Conservation Issues in and around the River – The Mersey Estuary west of the Runcorn Railway bridge is a Site of Special Scientific Interest (SSSI) and RAMSAR site of international significance. East of the existing crossings, a number of Sites of Biological Importance (SBIs) have been designated on the marshland both north and south of the river. These sites are of local importance and do not have statutory protection, though there are local plan policies relating to them. The SSSI/RAMSAR area could potentially be under threat from a new crossing during the construction period – when construction of the bridge piers might disturb contaminants in the underlying silts which could be washed downstream – and when the bridge is in place – through changes to the hydrological regime in the river which might affect water levels and flow patterns.

Navigation and Hydrological Issues in the River and Manchester Ship Canal. There are rights of navigation on both the River Mersey and the Manchester Ship Canal, conferred by Act of Parliament. The height of the current road and rail crossings at Runcorn Gap are the governing factors in determining the height of shipping which could make use of the river or ship canal to the east of these crossings. A new crossing would either have to provide a clearance height similar to the existing bridges, have opening span(s), or remove some of the navigation rights. Any multi-span crossing in the river which maintains navigation would also need to recognise that the river channels are not fixed and their alignment tends to move with time. More critically, there are major hydrological issues to be considered. The flow regime in the lower estuary below Runcorn Gap is influenced by the behaviour of the upper tidal section east of Runcorn Gap. At present, navigation can be maintained to the Docks areas further downstream with limited dredging. The introduction of piers in the river for a new crossing could have a significant impact on the hydrology of the river.

23. A new crossing should therefore, seek to reduce air quality and traffic noise issues in Runcorn Town and West Bank, minimise any adverse impacts on the SSSI/RAMSAR site in the Mersey estuary and on hydrological issues, and recognise that there are other ecological, contaminated land, and navigation issues which will need to be addressed within scheme development.

The Second Crossing – Principles

24. Our review of the background situation thus led us to conclude that a new crossing must meet the following principles. It must -

- be effective in attracting sufficient traffic from Silver Jubilee bridge
- provide improved facilities/mode share for buses, walking and cycling
be located to benefit economic development and planning aims
be located to reduce Air Quality and Traffic Noise Issues
minimise property demolition and adverse environmental/ecological impacts, and
offer value for money, fundability and deliverability.

25. The financial issues are considered in more detail, later in this summary.

Potential Eastern Bridge Locations (see Figure B)

26. ‘Armed’ with these principles, we set about identifying bridge locations which would have the potential to meet the requirements. On the south bank, we identified two possible locations where a new crossing could tie in the existing Runcorn Expressway highway network -

- Connecting to Bridgewater Expressway at the present Astmoor West Interchange
- As an extension to the Central Expressway (connecting to the Bridgewater Expressway/Daresbury Expressway/Central Expressway junction)

27. On the north bank we initially considered three potential tie-in locations -

- Connecting to Widnes Eastern By-pass south of the Garston to Warrington railway and Ashley Way (West of Albright & Wilson’s works)
- Connecting to Widnes Eastern By-pass between Ashley Way and Fiddlers Ferry Road (East of Albright & Wilson’s works)
- Forming an extension to an upgraded Tan House Lane

28. Following an initial engineering assessment, we concluded that a Tan House Lane termination could not realistically be achieved due to the railway crossings and the need to maintain access to premises and minimise extinguishing businesses.

29. With two potential tie-in locations on each bank, we were able to devise four groups of schemes which could then be developed and analysed. These linked -

- Astmoor to West of Albright & Wilson
- Astmoor to East of Albright & Wilson
- Central Expressway to West of Albright & Wilson
- Central Expressway to East of Albright & Wilson

30. Within these four basic concepts, we also developed a number of sub-options in which the form of the terminal junctions varied.

Public Transport, Walking and Cycling Links

31. In order to address the walking and cycling issues, all of our potential schemes incorporated links to Widnes Town Centre, the St Helens Canal/Transpennine trail,
and Spike Island/Widnes Warth on the north bank, and Wigg Island, Runcorn Town (via the Wigg Island swing bridge), the Astmoor area and busway, and the Bridgewater Canal towpath.

32. Similarly, all potential schemes included a number of bus priority enhancements, including -
   - bus priority links to/from Lugsdale Road in Widnes (via the Fiddlers Ferry Road junction)
   - bus priorities/lanes within the terminal junctions
   - potential bus lanes on the bridge itself
   - direct linkage to/from Castlefields and Halton Lea by connecting the busway to Castlefields Avenue East.

33. These measures effectively extend the busway level of service onto the new bridge and onto the north bank of the river, linking Widnes into the Runcorn busway.

Bridge Form and Cross-Section

34. In order to meet the target traffic reductions for the Silver Jubilee Bridge, and include the enhancements to bus, walking, and cycling facilities as set out above, our proposal is that the deck of a new crossing would be about 27m wide. It would include a two-lane carriageway for each direction of flow, a central reserve between the two carriageways, a shared footway/cycleway to one side of the dual carriageway, separated by a verge. There would be a verge adjacent to the other carriageway edge, together with parapets at both bridge edges. The road would have a design appropriate for a 40mph speed limit road, and it would include street lighting.

Assessment of Bridge Options

35. Extensive analysis has been involved in assessing the various bridge options so that we can make recommendations for the type of scheme to be taken forward. In order to summarise the assessment concisely, we set out below a comparison of the termination points of the crossing options on the two banks of the river.

Comparison of Northern Terminations (West and East of Albright & Wilson)

- Planning & Economic Development – The East option is preferred because it more directly serves the Tan House Lane industrial area, and it could skirt (and serve), rather than intruding into, the Widnes Warth reclamation/special development opportunity area.

- Impact on Property – The differences between the schemes are limited; the west options would have some small impacts on the western fringe of the Albright & Wilson site and/or the eastern end of the former ICI plant (now owned by St Modwen); the eastern option affects a scrap recycling operation south of the Garston-Warrington railway, and potential development plots at Bowers Business Park.
Mersey Crossing Study Report – Volume 1

- Traffic Attractiveness – The western option is expected to attract about 34,000 vehicles per day (vpd) away from the Silver Jubilee Bridge, while the East of Albright & Wilson alignment could attract 40,000 vpd.

- Capital Cost – East of Albright & Wilson schemes cost about £8m more than more westerly schemes due to the additional rail crossing required, and slightly greater overall length.

- Traffic Economics – East of Albright & Wilson schemes provide an additional £20m of journey time savings and vehicle operating cost reductions compared with West of Albright & Wilson schemes.

36. Overall, our assessment is that there should be a preference for an East of Albright & Wilson alignment on the north bank.

Comparison of Southern Terminations

- Planning and Economic Development – there is a slight preference in favour of a Central Expressway termination, as this more easterly location gives more direct access to the Manor Park and Daresbury development areas.

- Impact on Property – the Astmoor West tie-in point is preferred on property impact grounds as it would affect one larger property which includes 8 smaller units; the Central expressway option would require 10 properties, incorporating 14 business units.

- Traffic Attractiveness – the Central Expressway alignment is preferred, as the majority of traffic using the bridge will approach and depart via the central expressway; this tie in point serves the main traffic demand directly, whereas an Astmoor West connection would introduce a ‘dog leg’ into the route to/from the Central expressway.

- Capital Cost – the Central Expressway option requires an additional outlay of about £22m when compared with the Astmoor West option, a proportion of which arises from increased land/property costs.

- Traffic Economics – the Central Expressway options provide an additional £11m time and operating cost benefits over the Astmoor schemes.

- Bus Improvements – the Central Expressway crossing can provide a more direct ‘busway’ type route for bus services between Halton Lea and surrounding residential areas on the south side to Widnes Town centre and suburban areas on the north bank.

37. Overall, therefore, we have concluded that the Central Expressway option provides a better performance but there is a significant cost penalty involved.

38. In addition to assessing the differences between the schemes, our assessment has, of course, considered a wide range of issues, upon many of which all options have a similar impact, as set out below.
Eco logical, River and Navigation Issues affecting all Options

39. Works to provide piers in the river, and the presence of those piers when the works are complete could have significant adverse impacts on a number of important issues:
   • the Mersey Estuary SSSI and RAMSAR
   • river and river bank ecology and contaminated land
   • hydrology (river flow)
   • navigation

40. At this stage, there is not sufficient information available to determine whether one scheme is likely to have a materially different impact on these issues than other schemes. Whilst some schemes might have different numbers of piers in the river than others, the overall impact might not be significantly different.

41. From a structural engineering/cost viewpoint we have considered various forms of bridge construction and concluded that the most cost-effective form of construction would be a concrete box girder bridge with spans of approximately 100m. This would result in between 7 and 11 piers in the river, depending on which option is selected. Some of the potentially adverse impacts of the crossing might be reduced if there were no piers in the river (though the impact of potentially much larger piers on the river banks may also be significant). We have, therefore, given some consideration to the use of suspension or cable-stayed bridges, which could span the whole river. However, they would add at least £50m to £80m to the cost. The cable stayed option would fall at the lower end of this range, but it requires considerably taller towers than a suspension bridge, and would penetrate the protected airspace requirements of Liverpool Airport. A suspension bridge would cost more, but could be constructed below the safety zone. Our financial assessment does, however, indicate that these higher cost schemes would not be financially viable.

Air Quality and Noise Issues - affecting all options

42. Our assessment indicates that air quality in West Bank and the western part of Runcorn Town is poor, with levels of nitrogen dioxide and particulates exceeding air quality targets. By 2025, advances in vehicle design and firmer regulations will mean that the level of particulates will have fallen below the target values over the whole area. All parts of West Bank and Runcorn will have improved nitrogen dioxide levels through technological improvement by 2025, but some areas will remain above the target levels. Whilst congestion will be removed, the reductions in traffic flow, irrespective of which eastern option is pursued are such that the impact of any of the eastern scheme options on air quality will be small, and will not materially change the air quality regime in the areas.

43. Traffic noise levels will gradually increase without a scheme in place. However, the impact of all the eastern crossings will be negligible – the scale of traffic flow reduction is not sufficient to cause a material change in noise levels, and any
reduction in flow is offset by an increase in traffic speed. The schemes will not bring about the 3dB reduction (the recognised threshold for a significant improvement) at any location.

Funding Mechanisms

44. We have examined how a new crossing scheme could be funded. We have considered conventional public funding through the Local Transport Plan process, and also a range of partial or full private sector involvement.

45. Our estimate of the cost of procuring a new crossing (including construction, land, and preparation costs) varies from £90m (Aiscoev to West of Albright & Wilson) to £123m (Central Expressway to East of Albright & Wilson with grade-separated junctions). The various scheme options do represent good value for money, and there is a strong argument for pressing for public funding to be made available for the project; the scheme should be given a high profile in this year’s LTP documents. However, we have concluded that funding through the LTP process is unlikely – only because the size of the overall public sector ‘cake’ likely to be available for transport infrastructure is too small for such a large ‘slice’ to be allocated to one project.

46. In any event, government is likely to require an analysis of the scheme’s suitability for private sector involvement. We have concluded that a Private Finance Initiative (PFI) or Public Private Partnership arrangement (PPP) would be a real possibility for a new crossing. However, the private sector consortium would need to recoup its outlay through the collection of tolls. Clearly, the tolls would need to be applied to both the Silver Jubilee Bridge and the new crossing if any significant income is to be generated.

47. We would envisage an arrangement whereby the existing bridge (and its maintenance commitment(s) would be handed over to a consortium which would undertake to build a second crossing (and possibly other socially important infrastructure), maintain the second crossing, operate both bridges and, after an agreed period of time, would hand the infrastructure back to the local authority. At that point, the consortium would have repaid its loans to the banks, and would have made its profits on the venture. The local authority would receive back the bridges in good condition and, although the maintenance liability would return to the Council, so would the toll revenue, which could be used to fund other transport infrastructure.

48. We estimate (on a very preliminary basis) that the long term net income from the bridges could amount to £8m to £16m per annum, and that the private sector would need to be given a concession period extending to somewhere between 2023 and 2038, depending on the value of a number of assumptions.

Overall Assessment

49. The overall conclusions of our assessment of potential eastern crossings of the river are that -
Mersey Crossing Study Report – Volume 1

- Both bridges in combination can act as an integrated package to provide good facilities and a good level of service for general traffic, bus passengers, pedestrians and cyclists.
- Eastern Crossings performs well in terms of -
  - Traffic performance
  - Improved Public Transport facilities
  - Cycling and Walking Linkages
  - Economic Development/Regeneration aims
- Eastern Crossings performs poorly in terms of -
  - Potential environmental impacts in the River and on the River banks
  - Impact on air quality and noise (where their impact is limited)

Scheme Preference

50. Of the wide range of eastern crossings which we have considered, we conclude that

- The best performance is provided by Central Expressway to East of Albright & Wilson crossing (see Figure C), but it also has the highest cost (£118 to £123m) and most impact on property
- The Astmoor to East of Albright & Wilson scheme performs slightly less well, but costs £20m less (and has potentially less impact on Wigg Island)
- Both options should be fundable via PFI or PPP routes
- Further studies are required on ground conditions, environmental issues, hydrology, and funding

Comparison with Previous Studies

51. The most recent river crossing study recommended that additional capacity be provided at Runcorn Gap (by effectively duplicating the existing bridge). In view of that recommendation, and to provide a complete assessment of the situation, we have compared the eastern schemes which we have developed in the course of this study with an alternative concept of providing additional capacity at Runcorn Gap. We have assumed that the duplication option would include the provision of a four lane northbound bridge (together with new facilities for pedestrians and cyclists), located between the Silver Jubilee Bridge and the Railway Bridge. The bridge would take the form of a concrete box girder bridge with piers adjacent to the railway bridge piers. The existing bridge would provide for southbound traffic, and some enhancements to bus priorities would be provided in both directions, together with alterations to the approach roads on the south side.

52. Our comparative assessment is set out below.
Planning & Economic Development Issues:

- Both scheme types offer congestion relief; the eastern option may open up more land, and is better located to serve Manor Park and Daresbury development areas on south bank, and SE Widnes on north bank.

Environmental Impact:

- Ecology – there would be a much reduced impact with a Runcorn Gap crossing as the river bank SBIs should be unaffected.
- Pollution – there would be reduced silt disturbance with a Runcorn Gap crossing – as the rock head is closer to the surface, and the faster river flow means that there is less silt present, and there would be far fewer piers in the river.
- Hydrology/Navigation - river flow impact is minimised with a Runcorn Gap scheme as the piers would be in line (and immediately adjacent to) those of the railway bridge, and navigation rights would be unaffected as the scheme would need to be at the height of the current bridge to tie in to the approach roads (simplification of these issues should allow a bridge to be provided sooner).
- Noise/Air Quality – the noise impact of a Runcorn Gap scheme is virtually identical to that of an eastern crossing; an eastern scheme would have a marginally better air quality impact than duplicating the current bridge.
- Traffic Economics – A Central (Runcorn Gap) crossing would produce £78m time & operating cost benefits compared with £98m to £131m with eastern options.
- Public Transport – it would be more difficult to achieve as great an improvement for public transport with a Central (Runcorn Gap) crossing.
- Walking and Cycling – there is more scope for improving links from West Bank to Runcorn with a Runcorn Gap crossing; an eastern crossing offers much more scope for leisure trips.
- Impact on Land – The Central Runcorn Gap crossing would require 20 residential properties, the eastern crossings demolish 8 to 14 industrial units.
- Construction, Land, Fees costs – We estimate the overall cost of providing a duplicate crossing at Runcorn Gap at £50m, compared with an Eastern crossing cost estimate of £90m to £123m.
- Financial Viability – From a financial viewpoint, a Runcorn Gap crossing would be of much greater interest to the private sector (as toll income would be similar for all options, but capital outlay and ecological/river issues are likely to be less onerous for a Runcorn Gap solution). Hand-back to Local authority of a PFI scheme might take place between 2018 and 2024 for a Runcorn Gap scheme compared with 2023 to 2038 for an eastern scheme, providing the local authority with an income stream much earlier.
Conclusions

53. The main conclusions of our study are that eastern crossings -
- are technically feasible and provide good value for money
- have costs which fall within a viable PFI funding range
- perform well in terms of traffic operation and economic development aims
- but have potentially serious adverse environmental impacts

and that
- a robust case for public funding of a scheme can be included in this year's LTPs
- as an absolute minimum, and given the scheme's value to a range of local authorities, LTP funding should be made available for future stages of the feasibility and development work
- the Central Expressway to East of Albright & Wilson option is the best performing but most expensive option
- A firm preference cannot be finally confirmed prior to more detailed surveys being carried out, the most critical of which are:
  - Geotechnical/contamination surveys to determine the location and strength of the rock-head on various alignments and the nature of (and contamination potential of) overlying material, both within the river and on the banks
  - Computer-based and physical modelling of the river hydrology to determine the impact on the river flow regime of various crossing locations and construction forms, so as to assess the acceptability and scope for mitigation on river flow/dredging and ecological issues, thus
- Alternative schemes – particularly Astmoor West to East of Albright & Wilson, and the Central Crossing at Runcorn Gap - should not be ruled out at this stage.

54. In order to achieve the target open year of 2010, the current momentum needs to be maintained. We recommend that
- further work is commissioned to examine alternative funding and procedural routes to achieve the implementation of the bridge
- survey and analysis work on ground condition and hydrological issues, essential to confirm the deliverability of a scheme, is commissioned at an early date
- the government office be encouraged to provide funding towards these next stages of scheme development (contrary to the normal practice for LTP schemes) due to the scale of the project and its importance at a Regional level.
The Preferred Eastern Option (Central Expressway to East of Albright & Wilson - Option 5/5A)