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MERSEY GATEWAY

DESIGN AND ACCESS STATEMENT

VOLUME 1: MAIN TEXT

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MERSEY GATEWAY

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C O N T E N T S

1. INTRODUCTION

1.1 This Design and Access Statement is submitted in respect of the Mersey Gateway Project (the 'Project'), which is described in greater detail below. It accompanies the following applications:

a. Planning Application for the improvements to the Central Expressway, Weston Link and the Weston Point Expressway;

b. Planning Application for the modifications to the approaches to the Silver Jubilee Bridge (the 'SJB');

c. The Listed Building Consent concerning the modifications to the carriageway on the SJB.

These applications are subject to Sections 62 and 327A of the Town and Country Planning Act 1990 (the '1990 Act') and Section 10 of the Planning (Listed Buildings and Conservation Areas) Act 1990. Both of these acts were amended by the Planning and Compulsory Purchase Act 2004 to require that certain applications pursuant to their terms and other sections must be accompanied by a design and access statement.

1.2 Authority to construct a significant portion of the works comprised in the Project will be sought by an application under the Transport and Works Act 1992 (the 'TWA'). This application will be accompanied by a request to the Secretary of State for Transport for a direction that planning permission be deemed to be granted pursuant to Section 90 (2A) of the 1990 Act. Although there is no legal requirement for TWA Application or such a request to be accompanied by a Design and Access Statement, this document will be a material consideration for the Secretary of State for Transport in determining the request made and the TWA Application.

1.3 This statement is accompanied by a Supplementary Annex containing illustrations. References to numbered figures in the Annex are pre-fixed by the letters 'SA'. The Works that will be subject to Planning Application are shown edged red on Plan SA1. The Works that will be subject to an application under the TWA are edged in blue in the same plan. Together these areas are known as the Project Area.

1.4 The 1990 Act is supported by the provisions of subsidiary legislation as well as guidance contained in Planning Policy Statement 1 ('PPS1') and Government Circular 01/2006: Guidance on Changes to the Development Control System. PPS1 states: "*Good design ensures attractive, usable, durable and adaptable places and is a key element in achieving sustainable development. Good design is indivisible from good planning. Planning authorities should plan positively for the achievement of high quality and inclusive design for all development, including individual buildings, public and private spaces and wider area development schemes. Good design should contribute positively to making places better for people. Design which is inappropriate in its context or which fails to take the opportunities available for improving the character and quality of an area and the way it functions, should not be accepted*."

1.5 While much of PPS1 is directed towards buildings, the sentiments expressed within it can be extended to a highway scheme. By definition, a road or bridge has access as a primary purpose. Thus design and access in a highway project are inextricably linked. The principles expressed within Circular 01/2006 for what is required in a Design and Access Statement have been embodied within this report and are set out within Section 4 of this statement, which should be read in conjunction with the Supplementary Annex. The visual annex includes illustrations, drawings and photographs that support and amplify this text.

1.6 By its very nature, a highway project is a linear feature. For convenience, the Project has been divided into discrete areas within the Design and Access Statement. These areas have characteristics that distinguish them from others. While there is a need for a coherent approach

to design to be adopted throughout the length of the project, the specific characteristics and requirements of the individual areas are recognised and described.

Purpose of Report

1.7 The Design and Access Statement aims to explain the process and factors leading to the design solution expressed by the design set out in the drawings submitted with the applications referred to in paragraphs 1.1 and 1.2 above. It is the design that has been subjected to an environmental impact assessment and for which the Environmental Statement that also accompanies the various applications has been prepared.

1.8 The Mersey Gateway Project has evolved from an identification of a need but with a recognition that that need has to be satisfied within a mix of constraints and conditions that are specific to Halton and Merseyside. Any new piece of infrastructure has to be sensitive to the natural environment in which it is located while also serving the purpose for which it is being created. In any scheme there will be both benefits and disbenefits both social and environmental. The structures that will by necessity be required to carry traffic will be interpreted in a manner that harmonises with their context while attempting to provide visual interest in themselves. The design requirement is for a coherent product that expresses the character and ambitions of the vibrant community that forms this part of North West England, whilst performing its engineering purpose.

1.9 The Project as a whole is a North-South transport link that incorporates improvements to the existing Silver Jubilee Bridge (SJB). It provides a new crossing of the River Mersey that relieves the SJB of much of the traffic that presently causes extreme congestion. The new route forms an essential link between the Merseyside area and North Wales and Cheshire. The reduced traffic will permit the SJB to be restored to its function as the local bridge serving the residents on both banks of the River Mersey in Halton and beyond. Improved public transport access to the SJB can be achieved, while pedestrian and cycling crossings of the Mersey can be encouraged.

1.10 The Project includes a new bridge (the New Bridge), which will cross the River Mersey upstream of the SJB. The New Bridge will be a significant structure, capable of becoming a symbol for the area. To achieve this aspiration it should be a structure of architectural merit.

2. PROJECT AIMS

Aims, Scope and Objectives

2.1 The aim of the Project is to deliver a new crossing of the River Mersey (the "River") in Halton that links into the existing principal road network. It will provide more effective road connections between the Liverpool City area and north Cheshire, allowing more effective connectivity for the North-West sub-region. It will provide an opportunity to re-balance the transportation infrastructure within the Borough of Halton towards delivering local transport and economic goals. The locations of Halton and the local road network are shown at SA2 and the proposed route is shown at SA3.

2.2 The Project's scope covers the following:

a. The delivery of a new road crossing of the River in Halton, to be known as the Mersey Gateway Bridge (referred to as "the New Bridge" throughout this statement);
b. Its incorporation into the existing highway network;
c. Modification and de-linking of the Silver Jubilee Bridge (the 'SJB');
d. Its integration with public transport, cycle and pedestrian links across Halton;
e. Its integration with the surrounding environment through landscaping; and
f. Implementation of tolling and development of associated infrastructure.

2.3 Halton Borough Council (the 'Council') has established a number of strategic objectives for the Project which includes the following:

a. To relieve the congested SJB, thereby removing the constraint on local and regional development and better provide for local transport needs;
b. To apply minimum toll and road user charges to both the New Bridge and the SJB consistent with the level required to satisfy viability constraints;
c. To improve accessibility in order to maximise local development and regional economic growth opportunities;
d. To improve local air quality and enhance the general urban environment;
e. To improve public transport links across the River;
f. To encourage the increased use of cycling and walking; and
g. To restore effective network resilience for transport across the River Mersey.

Social Connectivity

2.4 The history of Halton is one of a community divided by the river. North and South banks have developed in their own ways with little communication between them. Nevertheless, the narrowing of the Estuary at the Runcorn Gap has always been recognised as offering the most obvious crossing point – first by a ferry and, more recently, by a rail bridge and a road crossing. The first road crossing consisted of a transporter bridge (which had inherent, severe capacity limitations) and, in the second half of the 20th Century the transporter bridge was replaced by the current SJB.

2.5 In each case, usage and demand grew until the capacity of the crossing was exceeded.

2.6 The aim of the Mersey Gateway is to correct that imbalance by providing a new crossing for strategic traffic and return the SJB to a local crossing. The anticipated, vastly reduced use of the SJB by vehicular traffic permits dedicating deck space to pedestrians and cyclists.

2.7 Public transport will also figure highly in the new Mersey Gateway. The well developed Busway System in Runcorn can be extended into Widnes by ensuring Public Transport is given priority access over the SJB. Provision is also being made to enable access to the New Bridge for a possible Light Rapid Transit (LRT) system. The LRT system itself will not be installed as part of the Project, but space within the structure of the New Bridge can be reserved and accessibility created that will make future access relatively simple to achieve.

2.8 It is not just cross-river links that are of concern. The project involves considerable change to a North-South swathe through the Borough, especially through South Widnes, and it is important to retain (and improve) East-West movements across the corridor of the Project.

2.9 Particular interfaces with existing infrastructure include:

a. Ditton Junction;
b. Victoria Road;
c. St Helens Canal and the Saltmarshes;
d. Manchester Ship Canal and Wigg Island;
e. Astmoor Industrial Park;
f. Bridgewater Canal; and
g. the Central Expressway.

Regeneration

2.10 The Council is currently developing a Regeneration Strategy that will consider the various options for how the Project can enable and contribute to the regeneration of parts of South Widnes, Runcorn Old Town and the Astmoor Industrial Estate. However, whilst the opportunity to carry out such regeneration is provided by the Project, it is not part of the Project itself. The project design has however been influenced where special considerations are required to support the emerging regeneration schemes.

3. ENVIRONMENT

3.1 This section of this statement describes the location in which the Project will be constructed – the environment in which it is set. It does this by describing the wider area and then the specific corridor in which the works will be built.

Existing Transport Network

3.2 The Borough of Halton stands at a strategic crossing point of the Mersey Estuary. This point, known as the 'Runcorn Gap', provides the location for the main rail crossing of the Mersey linking Liverpool and the West Coast Main Line. It is also spanned by the SJB carrying the A557 road between the M62 and the M56 (see SA4.1.1 to SA4.1.9). The A557 is a principal road, maintained by the Council as the local highway authority and connects with the M56 and M62. To the west of Widnes the A562 Speke Road links Widnes to south Liverpool. The M62 to the north of the Borough links the majority of Merseyside to Manchester and across the Pennines to the Yorkshire conurbations. To the south, the M56 links North Wales and Cheshire to Manchester. Halton, therefore, lies on a transport interchange in the North West of England.

3.3 The SJB was completed in 1961 replacing the previous Transporter Bridge at Runcorn Gap. It is the only internal road link within the Borough between the towns of Runcorn and Widnes. The bridge is of major strategic importance to Merseyside and North Cheshire, with 40% of traffic crossing the bridge making trips across the region and an additional 40% having either an origin or destination outside the Borough.

3.4 The current theoretical capacity of the SJB is approximately 65,000 vehicles per day (vpd) but it regularly carries in excess of 80,000 vpd and a figure of 91,000 vpd was recorded in 2007. These traffic flows, combined with the four sub-standard lanes and absence of any hard shoulder, have inevitably led to congestion, which is having a impact on the communities surrounding the SJB. Peak hour capacity has been reached. Congestion associated with the SJB is also seen as a constraint to economic regeneration locally, within the Borough, and across the wider Merseyside region. As a result of these problems the Council is promoting a new crossing of the River.

Description of Widnes

3.5 Widnes is situated on the north bank of the River Mersey (SA4.1.9). It is a low-lying town, which occupies a broad tract of gently sloping ground, which falls towards the river.

3.6 Other than occasional outcrops of the underlying red sandstone there are no distinctive landscape features and the town, which is characterised by its expansion in the Victorian era as the centre for the chemical industry. During its growth, Widnes has expanded from a core of high-density, terraced housing surrounding a compact town centre, to absorb many of the surrounding villages within its urban fabric.

3.7 To the south of the town a spur of land projecting into the river contains the area of West Bank (SA4.1.2 et al), which forms a narrowing of the River to create the Runcorn Gap together with a spur projecting northwards from Runcorn. This forms a natural constriction in the River valley which became a focus for ferry crossings and subsequently the lowest point in the Estuary downstream of Warrington at which it was possible to construct a bridge crossing.

3.8 For almost the entire length of the north bank of the Mersey within the Borough, the Estuary is fringed by a mix of industrial development, residential development (SA4.1.4 – SA4.1.7) and, latterly, edge of town commercial and retail expansion. The result is that, apart from intermittent

views from the side of the St Helens Canal and some of the adjacent areas, views of the Estuary from residential areas and areas of public access are largely blocked or screened by the industrial fringe and other buildings.

3.9 Between the industrial developments and shoreline is the local Garston and Timperley freight railway line which is adjacent to and parallel with the St Helens Canal (SA4.1.2). Although not currently used for navigation, the canal is an important recreational resource and the towpath, which is on the southern side of the canal and adjacent to the Estuary, accommodates the Trans-Pennine Trail. This is a long distance coast-to-coast route for walkers, horse riders and cyclists, between Southport and Hornsea - a distance of some 215 miles. On the Trans-Pennine Trail, easy gradients and surfaced paths make many sections, including most of the route that passes through the Borough, suitable for families, gentle exercise and people using wheelchairs and pushchairs.

3.10 The A557 Widnes Eastern bypass (SA4.1.7) and the Garston – Timperley Freight line (SA4.1.2) form a distinctive landscape feature and a transportation corridor which is both visually dominant and a physical barrier, especially where it leads to the SJB approaches. Other than this, transportation corridors do not form substantive visually significant landscape features in Widnes.

Description of Runcorn

3.11 The spur of land on which the old town of Runcorn is situated projects into the River (SA4.1.3 - SA4.1.4 and SA4.1 8), which flows to the north and then to the west of the town. In contrast to Widnes the landscape is distinctive with the north facing slopes of the margins of the River rising steeply to form a local ridge. The ridge runs parallel to the estuary and culminates in natural outcrops of red sandstone, the most prominent of which is occupied by Halton Castle.

3.12 The land use to the south of the Estuary contains the same basic structure as that to the north. However, due to its topography with the underlying upper mottled sandstone creating a steeply sloping north facing ridge the landscape exhibits completely different characteristics throughout the slopes where there are both intermittent and panoramic views.

3.13 As with Widnes, the older parts of Runcorn are characterised by high-density, predominantly terraced housing areas clustered around a compact town centre, which expanded to absorb adjacent villages. However, it is the new town, built to the east of the existing town in the 1960's and 1970's which now defines much of Runcorn's character. It is characterised by clusters of purpose-built high-density residential districts, delineated by a series of expressways and bus lanes. These provide links between the various districts and focus upon the purpose built commercial and retail centre of Halton Lea. Notwithstanding the generally high density housing and areas of associated development, there are significant areas of open, green space, in particular heath land on Runcorn Hill and the extensive Town Park created as part of the new town.

3.14 The Bridgewater Expressway, busway and Bridgewater Canal follow the contours of the slopes, but do not register as prominent features in the wider context (SA4.1.5). Much more significant features are the natural valley features, which punctuate the slopes. Running in a north-south direction they contain the remnants of the natural land cover, open spaces and, most notably, the Central Expressway. The system of expressways, although segregating the main traffic flows from the main urban areas, can create barriers to access. They are crossed in key locations by a system of bridges and underpasses, which link the residential areas to the main urban centres.

3.15 The Manchester Ship Canal (SA4.1.1 et al) forms a continuous, linear feature immediately adjacent to the Estuary and is backed by an industrial fringe, albeit of smaller scale and generally of more recent origin than the industry on the North Bank. The industrial fringe gives way to mixed, but principally residential, development on the north-facing slopes, which culminate in the vantage point of Halton Castle, visible from much of the area on the northern bank.

Description of the Mersey Estuary and Runcorn Gap

3.16 The most prominent feature of the Estuary landscape is the Fiddler's Ferry Power Station (SA4.1.5). Located on the northern bank at the eastern extremity of the Borough, the power station is a well known landmark throughout the area and is readily visible from the Pennines, some thirty miles to the east.

3.17 Whilst the power station is the most prominent feature of the estuary, the most significant is the SJB. In juxtaposition with the adjacent railway bridge, this forms the present River crossing at Runcorn Gap.

3.18 The elegant SJB, though not as prominent as the power station, can (depending on weather conditions) also be viewed from as far away as the Pennines and has become an iconic symbol of the North-West region on a par with the Jodrell Bank radio telescope. Visible from all surrounding directions, the SJB is the principal focal point for the surrounding urban areas of Runcorn and Widnes and in turn it affords spectacular views of the upstream Estuary to the east.

3.19 At either end of the SJB, the cluster of mainly residential properties forms the distinctive settlements of Runcorn Old Town and West Bank. Each is characterised by high-density housing in narrow grid pattern streets and has a church as a prominent focal point. Lying, literally, in the shadow of the bridge these communities are completely distinct from the remainder of the developed landscape and, from their waterside fringes afford comprehensive and panoramic views over the estuary. The bridge dominates the scene but despite being imposed on the settlements, is not oppressive.

3.20 The Estuary and its saltmarshes are designated as an Area of Special Landscape Value and there are two areas of open ground of particular significance, both on the margins of the Estuary. Spike Island on the north shore, adjacent to West Bank and Wigg Island adjacent to the south shore are designated as Important Landscape Features due to their value to the public and for their nature conservation interest and industrial heritage significance.

3.21 Spike Island, adjacent to West Bank, is formed around the point where the St Helens Canal enters the River. Formerly the site of a soap works and processing plant the 'island' is now a popular recreation area, which also functions as a staging post on the Trans Pennine Trail and provides the setting for the 'Catalyst' Chemical Industry Museum. Spike Island affords some of the most expansive views over the Estuary to be found within the Borough.

3.22 Situated on the southern margins of the Estuary, Wigg Island, formerly a repository for the storage and manufacture of munitions is now a community park with a strong emphasis on the enjoyment and appreciation of the nature conservation interest of the Estuary. A series of bird hides provided at vantage points overlooking the adjacent saltmarsh also permit panoramic views over the whole Estuary.

Areas affected by the route

3.23 The aerial photographs at SA4.1 enable the broad characteristics of Halton and its surrounding area to be understood. These photographs also show features of note in considering the design of the Project. The following sections of this statement provide more detailed descriptions of features affected by the route of the Project, by describing the nature of the works to be carried out in these locations.

3.24 St Michael's Golf Course - The former golf course, constructed on reclaimed contaminated land, occupies a slightly undulating site bounded by Speke Road to the south and local access roads elsewhere. Much of the site is visually contained by substantial lengths of established trees and shrubs, which delineate these boundaries. The areas that formerly comprised the fairways have now developed into rough grassland, with occasional areas of scrub and semi-mature woodland (SA4.2). The toll plazas will sit within and respond to the woodland screening already present in this area. Coupled with a sympathetic landscaping scheme, there is potential to reopen the area to cyclists and walkers.

3.25 Ditton Junction -The existing arrangement (SA4.3) takes the main A562 to Liverpool over a large roundabout that provides for local links into Widnes and its main industrial areas. Two structures carry the A562 over the carriageway of the roundabout the centre of which contains landscaped earthworks which support the A562. The existing roundabout is somewhat daunting for all users other than vehicular transport. The Project will provide a signal-controlled junction that will improve this junction significantly for pedestrians and cyclists. The new arrangement will permit dedicated facilities for both, with protected routes linking the town centre with the employment opportunities in the 3MG Development Area.

3.26 Victoria Road - The present arrangement in this area of South Widnes (SA4.4.1) can be categorised as run-down Victorian terracing interspersed with small work units. The exception is the Waterloo Centre (SA4.4.2). This 1930's brick building stands immediately adjacent to the route of the Mersey Gateway. Behind the Waterloo Centre is an industrial area: the Catalyst Trade Park. This is a series of modern steel framed buildings of little architectural merit. The new road will be elevated over 10 metres above general ground level – even higher than the existing Widnes Eastern Bypass. The Project requires the removal of the Widnes Eastern Bypass and the demolition of some of the existing buildings (including within the Catalyst Trade Park). There is an opportunity to create an open area under the new viaduct.

3.27 The new Widnes Loops Junction and Widnes Eastern Bypass toll plazas will be formed within the area presently occupied by the Catalyst Trade Park described above. The new junction will become a heavily trafficked feature so would be screened from the local area in and around Victoria Road by suitable hard and soft landscaping giving sound and sight mitigation. There is an opportunity to provide a relatively peaceful thoroughfare between Widnes Town Centre and West Bank, passing under the new viaduct.

3.28 St Helens Canal and the Saltmarshes (SA4.5) -This area forms the northern fringe of the upper estuary. It is flat and open providing extensive views to Fiddlers Ferry to the east and the SJB to the west. The St Helens Canal, while being currently disused other than for fishing and providing the route of the Trans-Pennine Trail along its towpath, has the potential to be reopened to navigation at some time in the future. Its lower reaches at Spike Island are used as a basin for boat moorings by a boat club. North of the canal, the area is allocated for new industrial uses. The saltmarshes provide valuable habitat. The new road will be elevated above existing ground level and the new structure forming the north termination of the New Bridge will allow the provision of a new east-west route along the north bank of the St Helens Canal. The

configuration preserves the canal itself and the Trans-Pennine Trail. Widnes Wharf saltmarshes will remain largely unchanged under the approach spans of the New Bridge.

3.29 Manchester Ship Canal and Wigg Island (SA4.6) - The south bank of the upper estuary is fringed with saltmarsh similar to that on the north bank but also includes Wigg Island - a Nature Park for the public (see paragraph 3.22). The ship canal is regularly used and maintenance of navigation forms an important design condition, dictating the Project's vertical geometry The elevated section of the New Bridge is well above the River, its saltmarshes and the Manchester Ship Canal and Wigg Island. Other than the specific obstructions of individual piers supporting the elevated road, local access remains essentially unchanged.

3.30 Astmoor Industrial Estate (SA4.7) - The area is flat and occupied by medium sized industrial units served by an internal road system with a dedicated busway. The new carriageway will be carried on an elevated structure through the Industrial Park. While some units will be demolished to permit construction of the Project, the areas under and adjacent to the new bridge can be returned to industrial use after completion. The new structure will be well over 20 metres above normal ground level. The space can be used for parking, storage or even small industrial units (providing arrangements are made for periodic inspection of the deck above).

3.31 Bridgewater Canal and Expressway (SA4.8) - The existing expressway system runs parallel to the Bridgewater Canal which runs east-west along the line of the estuary. The canal was cut into the sandstone ridge that defines the south bank of the Mersey and has become wooded with mixed species. This marks the north edge of the Runcorn New Town established in the 60s and 70s. The new road is elevated and access along the canal and its towpath will be preserved. The area is a valuable recreational asset and this will be maintained in the new design.

3.32 Central Expressway (SA4.9) - The length of existing highway has established crossings that will be maintained and/or developed with the improved highway.

4. PROJECT REQUIREMENTS

4.1 Policy

4.1.1 National planning guidance set out within PPS1: *Delivering Sustainable Development* expresses the Government's commitment to the delivery of sustainable development. PPS1 places emphasis upon Local Planning Authorities to ensure that development proposals both promote and facilitate good quality development, which is both sustainable and consistent with their Plans. Planning Authorities are equally encouraged to "*promote urban and rural regeneration to improve the well being of communities, improve facilities, promote high-quality and safe development, and create new opportunities for the people living within those communities.*"

4.1.2 Good design plays a fundamental role in achieving the objectives of PPS1 and it is worth repeating the extract given in 1.4, which states: "*Good design ensures attractive, usable, durable and adaptable places and is a key element in achieving sustainable development. Good design is indivisible from good planning. Planning authorities should plan positively for the achievement of high quality and inclusive design for all development, including individual buildings, public and private spaces and wider area development schemes. Good design should contribute positively to making places better for people. Design which is inappropriate in its context, or which fails to take the opportunities available for improving the character and quality of an area and the way it functions, should not be accepted*."

4.1.3 With regard to all forms of new development, PPS1 advises that "*significant adverse impacts associated with development should be avoided and alternative options which might reduce or eliminate those impacts pursued*." Where adverse impacts are identified as unavoidable, planning authorities and developers are required to consider possible mitigation measures to minimise the impacts of development. Mitigation of any potential impacts associated with new development should be considered during the design phase of development.

4.1.4 To assist in achieving the Government's objective of sustainable development as expressed within PPS1, the Commission for Architecture and the Built Environment (CABE) has produced guidance in the shape of *"By Design- Urban Design in the Planning System: Towards Better Practice."* This represents a material consideration in the determination of planning applications.

4.1.5 This guide expresses three key messages, as follows:

a. Good design is important everywhere, not least in helping to bring rundown, neglected places back to life;
b. While the planning system has a key role to play in delivering better design, the creation of successful places depends on the skills of designers and the vision and commitment of those who employ them; and
c. No two places are identical and there is no such thing as a blueprint for good design. Good design always arises from a thorough and caring understanding of place and context.

4.1.6 The 'By Design' guide is relevant to all aspects of the built environment, including the design of buildings and spaces, landscapes and transport systems. Both local planning authorities and applicants are urged to consult CABE at the earliest opportunity where they consider a proposal raises, or is likely to raise, significant design quality and access issues. The Project Team has had regard to this advice during design development, and has undertaken pre-application consultation with the CABE Review Panel at the following stages of the design process:

a. Initial early design review – 21 March 2007
b. Interim design review – 5 December 2007

4.1.7 The key issues raised by the CABE Review Panel, and which have sought to inform the design development of the Project, comprise the following:

Review of 21 March 2007

a. The procurement strategy should be reviewed to ensure the completed bridge is of a quality the local community can be proud of.
b. The new bridge should be a symbolic landmark
c. Consideration needs to be given to determine to what extent the bridge becomes a barrier as it lands at each end.
d. To investigate the space below the deck for use by pedestrians and cyclists. To explore the creation of new routes for pedestrians and cyclists on both the new and existing bridges. And to investigate the potential separations of pedestrians and cyclists from motor vehicles on the existing bridge.
e. Visualisations from various viewpoints should be produced to inform the design development.

Review of 5 December 2007

f. Further consideration needs to be given to determine to what extent the bridge becomes a barrier as it lands at each end.
g. It is important to ensure that the final structure will be of the highest possible quality in order to produce an elegant and distinctive bridge.
h. The quality of design should be retained through the bid process.
i. Suggest an elegant bridge design should include a sophisticated lighting design.
j. Indicative sections of the landings and other important intersections of the bridge structure with the surrounding landscape need to be considered.

4.1.8 Circular 01/2006 *'Guidance on Changes to the Development Control System'* outlines the statutory requirements for a Design and Access Statements to accompany all planning applications.

4.1.9 Circular 01/2006 states: "*A design and access statement is a short report accompanying and supporting a planning application to illustrate the process that has led to the development proposal, and to explain and justify the proposal in a structured way*."

4.1.10 Design and Access Statements are recognised as a mechanism through which developers and designers can demonstrate their commitment to achieving good design and ensuring accessibility in the work that they undertake. They should also be used as means of showing how the proposals are meeting, or will meet the various obligations placed on them by legislation and policy. A major part of a design and access statement is the explanation of how local context has influenced the design, and the steps taken to appraise the context of the proposed development.

4.1.11 Circular 01/2006 advises that statements should evolve throughout the design and development process, and should explain the key design principles and concepts that have been applied to particular aspects of the proposal – these include:

a. the **amount** of development which is proposed;

b. the **layout** of development, including an explanation and justification of the proposed layout in terms of the relationship between buildings and public and private spaces within and around the site, and how these relationships will help to create safe, vibrant and successful places;

c. the **scale** of development including the height, width, and length of a building or buildings in relation to its surroundings. The design and access statement should explain and justify the scale of buildings proposed, including why particular heights have been settled upon,

and how these relate to the site's surroundings and the relevant skyline. The statement should also explain and justify the size of building parts, particularly entrances and facades with regard to how they have been designed to relate to human scale;

d. **landscaping** – this includes the treatment of private and public spaces to enhance or protect the amenities of the site and the area in which it is situated through hard and soft landscaping measures. The design and access statement should explain and justify the proposed landscaping scheme, explain the purpose of landscaping private and public spaces and its relationship to the surrounding area, and comprise a strategy for landscape maintenance. Where possible, Circular 01/2006 also requires a schedule of the planting and proposed hard landscaping materials to be used;

e. the **appearance** of the development, including an explanation of the aspect of a place or building that determines the visual impression it makes, including the external built form of the development, its architecture, materials, decoration, lighting, colour and texture. In addition, an explanation and justification of the appearance of the place or buildings proposed including how this will relate to the appearance and character of the development's surroundings should be provided. It should explain how the decisions taken about appearance have considered accessibility.

4.1.12 In addition to the above, Circular 01/2006 requires the Access component of any Design and Access Statement to explain how access arrangements will ensure that all users will have equal and convenient access to buildings and spaces and the public transport network.

4.1.13 Circular 01/2006 also states the requirement for a design and access statement to accompany any application for listed building consent. Whilst applying the same broad approach used in preparing a design and access statement for planning permission, a design and access statement relating to listed building consent should include a brief explanation of the following:

a. the historic and special architectural importance of the building;
b. the particular physical features of the building that justify its designation as a listed building; and
c. the building's setting.

4.1.14 The Project design development and this Design and Access Statement have had full regard for the provisions and guidance set out within Circular 01/2006 in their preparation.

4.1.15 At a local level, the adopted Halton Unitary Development Plan 2005 (UDP) comprises two directly relevant policies that relate to the design quality of new development. These comprise policy BE1 and policy BE2, as follows:

Policy BE1 - General Requirements for Development

4.1.16 This policy establishes a series of criteria which all development proposals should satisfy where appropriate. This includes aspects in relation to the following topic areas:

a. **Environmental Quality** – this objective seeks to achieve high quality design in new development, comprising landscape proposals respectful of their surroundings and the existing character of the area. Development proposals should avoid an unacceptable loss of amenity by virtue of noise disturbance and unacceptable levels of additional sources of pollution. Proposals should also be designed having regard to reducing the fear of crime.

b. **Accessibility** - the design and layout of roads and associated footpaths must be in accordance with the Council's adopted highway standards, and must accommodate suitably accessible provision for cyclists, pedestrians and public transport, and people with disabilities and/or restricted mobility. Proposals should not overload the capacity of the surrounding highway network, nor should they prejudice accessibility to and the future expansion of greenway linkages within the Borough.

c. **Conservation of the Natural Environment** - the design of proposals must ensure the retention, conservation, integration, enhancement and management of sites and archaeological features of historic, landscape, or ecological importance which make a valuable contribution to the amenity value of the site or the surrounding area. Proposals should not result in the unacceptable loss of designated green-space or other important amenity space, nor utilise the best and most versatile agricultural land Grades 1, 2 and 3a.

d. **Infrastructure** - proposals must include adequate provision for any necessary improvements to utilities and services resulting from the development, and satisfy the Council's on site drainage requirements.

e. **Management of Resources** – development should not prejudice the planned development of a larger site or are for which proposals have been approved or are emerging. Where possible, design development should have regard to the need for energy efficiency and energy saving design, maximising the use of recycled materials and minimising waste production during construction and operation, including the on-site provision of waste storage and collection. Proposals should also take into account the need and potential to utilise sustainable drainage techniques.

4.1.17 So far as is appropriate and practical the Project has been designed having regard to the provisions of policy BE1 by:

a. Identifying a route that best suits the operation of the strategic highway network while also benefiting local transport needs;

b. Avoiding residential areas wherever possible and minimising the impact on commercial properties;

c. Incorporating landscaping proposals into the design that reinforce or supplement existing conditions;

d. Ensuring that public rights of way are maintained and providing facilities that encourage cycling and walking and that permit access by all – including those with limited mobility;

e. Adopting modern standards and guidance in providing safe means of access;

f. Understanding and respecting the natural environment throughout the route. In those areas of particular sensitivity, by treading as lightly as possible in engineering terms within them and minimising the impact of the new works;

g. Providing replacement facilities for those lost by the works;

h. Recognising development plans within the area and, where possible, designing the works to enable those plans;

i. Incorporating measures that deal with runoff from the Project and protect relevant receptors;

j. Recognising the potential effects of climate change;

k. Considering sustainability as a design objective by the use of appropriate materials and methods within the works;

l. Minimising the quantities of new materials within the works and incorporating arisings from the works where possible; and

m. Investigating the legacy of Halton's industrial past and ensuring that the new works can be implemented without any increase to pollution or its release.

Policy BE2 – Quality of Design

4.1.18 This policy states that the quality of design of a development proposal will be assessed by considering it against certain stated matters that influence overall design. These include the list below.

a. Layout;
b. Density;
c. Scale;
d. Massing;
e. Height;
f. Materials;
g. Landscape;
h. Access;
i. Accessibility;
j. Public Realm;
k. Topography and Site Levels;
l. Local distinctiveness and character;
m. Energy Conservation.

4.1.19 The policy advises that proposals should be designed to:

a. Respect the existing any positive characteristics of the area;
b. Respect and relate well to existing adjacent buildings and features of townscape value;
c. Optimise the relationship and integration of buildings;
d. Respect the nature and character of the surrounding area;
e. Create visual interest;
f. Provide an attractive building frontage with quality facing materials;
g. Maintain and protect views important to the character of the area;
h. Be of a height, massing, density and layout that respects human scale.

4.1.20 The policy promotes original and innovative architecture provided that it respects the character and appearance of its setting. Developments that will create a landmark or focal point will be acceptable where they will create an attractive reference point. Policy advises that planning permission will not be granted for proposals that will have an unacceptable effect on the character of the surrounding area because of their external appearance and style.

4.1.21 The Project has been designed having regard to the provisions of policy BE2 (but recognising that much of that policy is addressed to buildings rather than a new highway) by:

a. providing a highway alignment that best suits the needs of the travelling public while respecting the environment in which it is to be set;
b. setting design criteria that match the predicted use and satisfy current standards for those using the new highway and those adjacent to it;
c. adopting appropriate materials and methods in its construction;
d. recognising that new structures required to carry the new highway must meet the requirements of policies in BE2 as summarised in 4.1.20 above;
e. incorporating landscaping at all stages;
f. carrying out a full environmental Impact Assessment and develop the engineering in response to the outcomes; and
g. approaching the Project's design in the context of both the immediate conditions adjacent to the works and the wider landscape of the Mersey Estuary.

4.1.22 The Project has been developed in line with policies BE1 and BE2 by:

a. Providing access to and across the new bridge;
b. Providing access to and across SJB;
c. Maintaining and developing access to the estuary margins;
d. Maintaining and developing existing footway and cycleway links;
e. Maintaining and enhancing permeability where not to do so would be detrimental to public access and enjoyment.

4.2 Design Standards

4.2.1 The highway alignments and structures have been designed in accordance with the standards set out in the Design Manual for Roads and Bridges (the 'DMRB'). DMRB design standards are important because they stipulate the geometry and dimensions of roads if they are to function safely and efficiently. This in turn affects how the roads and associated structures are able to respond to their surroundings.

4.2.2 For roads two standards of design for roads are available, Urban and Rural. An Urban standard means minimum carriageway widths and small width central reserves, whereas Rural standards mean a wider central reserve and additional 1m strips on both sides of each carriageway. Urban standards permit closer junction spacing and greater flexibility in cross-section.

4.2.3 An analysis of the existing standards on the expressways within the Borough indicates that whilst the grade separation and lack of direct access to the expressway suggest Rural standards, other aspects such as junction spacing and merge/diverge geometry relate more closely to Urban standards. Nevertheless the project seeks to provide a high quality link for which Rural standards are considered more appropriate.

4.2.4 Cross Section: For the Mersey Gateway a Rural standard cross-section will be provided including hardstrips.

4.2.5 Design Speed: The following Design Speeds are proposed on the links listed, which it is anticipated will be enforced through mandatory speed limits.

Design Speed 100A (TD9, Table 2 Urban 60mph)

a. River Crossing and Approaches
b. Speke Road Approach
c. Weston Point Expressway
d. Central Expressway (North of Halton Lea)
e. Southern Expressway (North of Southgate Junction)

Design Speed 85A (TD9, Table 2 Urban 50mph)

f. Central Expressway (South of Halton Lea)
g. Southern Expressway (Approaching Lodge Lane Junction)
h. Weston Link

Design Speed 60A (TD22, Table 4/1, Urban 30mph Slip Roads)

i. Widnes Loops / Slip-roads
j. Bridgewater Junction Slip-Roads
k. Speke Road Slips, Northern Link Road (West of Ditton Plaza Option)
l. Ditton Interchange Slip-Roads (East of Ditton)
m. Halton Brow Connector Roads
n. Halton Lea Connector Roads (south facing)

Design Speed 60B (TD9, Table 2, Urban 30mph)

o. Queensway

4.2.6 Horizontal Alignments: Physical constraints along the alignment mean that derogations from the DMRB design standards sometimes occur. Provided adequate stopping sight distances (SSD) can be provided, there are no restrictions to where these derogations can be applied.

4.2.7 Gradient: Design standards advise a maximum gradient of 4% for all-purpose dual carriageways. The proposed alignments comply with this requirement.

4.2.8 Superelevation: Superelevation has been applied appropriate to the combination of design speed and horizontal radius.

4.3 Physical Constraints

4.3.1 The following is a general statement of the physical conditions of the Project Area through which the Project passes. Location-specific physical constraints are addressed in the section of this statement dealing with design on a location-specific basis. This is set out at Part 6 of this statement.

Interfaces with Existing Infrastructure

4.3.2 Vertical clearances required for existing highways are 5.3m headroom for underbridges and 5.7m for footbridges and toll plaza canopies over the new highway.

4.3.3 Clearances required by Network Rail over the Timperley to Garston Freight line are 5m headroom to rail level and 4.5m lateral clearances to permanent features.

4.3.4 There are numerous interfaces with existing services along the route alignment. Some of these will require diversionary works in advance of the main works. In other areas the existing services creates a constraint, ie including a high-pressure gas main that lies alongside the Trans-Pennine Trail.

Navigation

4.3.5 The following navigation clearances are required or (where currently closed to navigation) assumed:

Waterway	**Air Draft**	**Minimum Soffit Level**
Manchester Ship Canal	24.25m above Normal Water Level of 4.38m AOD	28.63m AOD
Bridgewater Canal	5.00m above the Normal Water Level of 25.26m AOD	30.26m AOD
St Helens Canal	5m above the Normal Water Level	20.30m AOD

4.3.6 No specific requirements for air draft clearances have been established for the River Mersey. However, the minimum clearance achieved - 14.35m above MHWS of 5.1m AOD at the north edge of the inter-tidal zone - has been approved by the Harbourmaster on behalf of the Navigation Authority (MDHC).

Aviation

4.3.7 Liverpool John Lennon Airport requires the maximum level of any obstruction during the construction and operation of the New Bridge to be restricted to not higher than 150m AOD.

Future Light Rapid Transit (LRT)

4.3.8 The construction of the New Bridge provides an opportunity to secure a future route for LRT between Widnes and Runcorn within the design of the bridge structure and highway alignment. While there are no firm plans for providing a light rail or tram service across the river in Halton in the short term, the Council has made it policy to make provision for such a facility in the future. Accordingly, the new bridge will be designed to permit an LRT to be included within its structure without the need for major alterations.

Ground Contamination

4.3.9 In the urban areas of the Project Area, the ground conditions generally comprise made ground over alluvial and/or glacial drift deposits that in turn rest upon bedrock. The made ground includes a broad range of contaminants, consistent with the industrial heritage of the area. A general principle of the design has been to minimise the excavation so as to avoid the treatment and disposal of contaminated materials.

Terrestrial Ecology

4.3.10 The Estuary to the west of the SJB is of national and international nature conservation importance for its estuarine habitats and associated avian life. In addition there are a number of other local wildlife sites (LWS's) close to the Project Area. Habitats within the study area also have the potential to support species of fauna protected under national and European legalisation. This Project's design has sought to respect such designations.

Hydrodynamics

4.3.11 The Upper Mersey Estuary is characterised by a series of channels, which show lateral movement, and sand banks which are exposed twice daily by the tidal rhythm, and which are sometimes never covered by the tides. In common with many other UK estuaries, the Estuary has been infilling over time. In the future, the general trend for siltation is likely to continue, with the rate of siltation dependent on the balance of marine to fluvial sediment supply.

4.3.12 In terms of design the structures within the Estuary and the construction methods involved in their installation should limit their impact on the natural estuarine processes. This has affected the design of the New Bridge within the Estuary and a design predicted to be least likely to affect the estuarine environment has been adopted

Geology

4.3.13 As shown on SA5, the geology in the Project Area on land consists of made ground overlying glacial deposits that have formed across the study area, except in parts of Wigg Island and Astmoor Saltmarsh, the Estuary and parts of Runcorn (close to the Manchester Ship Canal). These glacial deposits comprise glacial till (boulder clay) and sands and gravels. Alluvium material, associated with the River is present on the saltmarshes and the sand banks. Bedrock in the area is comprised of red sandstone.

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

4.3.15 On the northern side of the River the area was historically used for heavy industry with numerous chemical works noted on historical maps prior to the 1960's. To the south of the River there is evidence of industrial development with chemical and other industrial land uses around the southern end of the SJB and along the northern side of the Manchester Ship Canal. The resulting legacy of ground contamination has lead to a design that minimises the excavation of the existing made ground.

5. STRATEGIC DESIGN

5.1 This part of this statement describes the Project as a whole, and its design having regard to the whole Project Area. This deals with universally applicable design concepts. Design of separate elements of the Project is assessed at Part 6 below.

. Design Philosophy

5.2 The Mersey Gateway will extend from the northern part of Widnes on the A562 Speke Road to Junction 12 of the M56. The new road will include a section cutting a path through South Widnes, a section crossing the environmentally sensitive Mersey Estuary and a final section through an established industrial park at high level. Thereafter, the route follows existing highway requiring some modifications to existing junctions. The aim is to provide a distinctive signature to the whole project that gives an identification with the area within a coherent theme. To this end there is a need for certain details to be consistent throughout.

5.3 Highway Details - Carriageway widths will be maintained as appropriate to rural standards. Dual 2-lane will be kept to as a minimum with 1m margins to a kerbed edge. The central length between the junction with the Widnes Eastern Bypass and the Daresbury/Bridgewater Expressways south of the River will be dual 3-lane. Kerb and central reserve details will be kept constant. Pedestrian access along the route will be prohibited and generally verges will be grassed and maintained. Over the structures, the verges will be formed from a hard finish such as brushed concrete. Safety fencing will be provided throughout within the central reserve and to the verges where required by current Highway Standards.

5.4 Bridge Parapets - At structures the safety fence will generally join with open 3-rail parapets. In the urban areas within Widnes, the parapets will be solid concrete to minimise noise and reduce the visual intrusion of traffic (SA7.1 and SA7.2). Over the railway, solid high containment parapets will be provided. Over the main bridge, the parapets will be supplemented by wind shielding. Highway Parapets are prescribed by TD19/06. Metal parapets will be either aluminium (in which case they are left unpainted) or painted steel. If the latter are selected, the paint colour will be a neutral grey.

5.5 Highway Lighting - The highway is to be lit throughout its length. Column details will be consistent with arms and luminaries that are standard in Halton and that feature throughout the expressway system. Should a revised or different stand be adopted this will be developed prior to the time when construction commences.

5.6 White Lining and Highway Marking - Road markings will be to current Highway standards. White, amber, red and green reflective studs will be used as appropriate.

5.7 Surfacing - A bitumen macadam wearing course, or equivalent, will be provided throughout including over structures.

5.8 Signs - Highway signs will be designed in accordance with Traffic Signs Regulations and General Directions and DMRB.

5.9 Structures There is a significant structural content within the Project with a particularly highly visible central feature that is the New Bridge. All structures carrying the main line will be linked visually by a strong line defined by the underside edge of the parapet stringcourse. This will form a reference for observers remote from each structure and will provide a continuous feature for the eye to follow. The decks themselves will vary between structures but, generally, they will

feature less prominently by being in shadow. Pier details will be kept consistent from structure to structure, with similar finishes being selected for each location.

5.10 Overbridges are few and do not feature in the new section of the Works. Where structures require modifying on the existing highway, details will be kept consistent with those structures remaining. New structures will be themed to complement existing structures while providing a reference peculiar to Halton.

Secondary Spans

5.11 The design of the bridge structures other than the New Bridge that make up the Mersey Gateway between Liverpool Road and the Central Expressway have been carefully co-ordinated with the New Bridge so that, for example, consistent edge detailing will provide a familiar character to the entire length of the route. The number of different types of containment has been optimised to ensure, so far as is reasonably practicable, that the edge condition is constant and that, where variations are required (for example, the high level wind shield across the main crossing or the high containment parapet over the Garston to Timperley Freight Line) these flow seamlessly into each other.

Bridge and Route Furniture

5.12 Care has been taken in describing finishes for the selection, appearance and detailing of bridge and highway furniture to ensure that a uniform, high-quality appearance is provided along the entirety of the route. This includes a study to coordinate all the applied and natural finishes to be used in structures, furniture and surface finishes; coordinated lighting and signage regimen, and; consistency in selection of highway containment. This has been coordinated with the landscape design.

Maintenance

5.13 All structures need to be maintained if a long working life is to be obtained. Good design can minimise the cost of maintenance by the use of well chosen materials, properly detailed and installed. But equally important is the need to design with maintenance in mind. Inspection needs to be easy. Access to elements that will need regular maintenance needs to be considered. Parts that could require replacing need to be accessible and capable of withdrawal and reinstalling – safely.

Landscape

5.14 The Mersey Gateway will succeed by ensuring that the new landscape proposals anchor the new works into their environment. The following section describes the approach taken to ensure that aim by considering the route in its entirety and as a series of individual features.

5.15 North of the Estuary the route would initially pass through a disused golf course within which would be set the broader expanse of the toll plaza, which would contain tollbooths envisaged as of a similar design and specification to those on the M6 Toll Road. The locations are shown on SA6.1.

5.16 The scale and visual impact of the toll plaza would be substantially screened by existing densely planted mature trees, which delineate the boundary of the golf course. Within this area it is proposed to enhance the existing green space by the introduction of wildflower grasslands. This would have the advantage of imposing amenity whilst minimising disturbance to underlying residual industrial contamination, which in places is near to the surface.

5.17 At the Ditton Junction the opportunity to create a new and imposing gateway to Widnes will be realised. A new grade separated junction would incorporate safe pedestrian routes, largely segregated from traffic in an ornamental landscape setting designed to provide year round seasonal interest and colour. Through traffic would pass over the junction and travel along an elevated section of highway bounded by slip roads, which also contain tollbooths. The whole of this section would be visually contained within dense woodland planting designed to screen views of the surrounding, largely degraded landscape whilst permitting selected views towards the Estuary and Widnes town centre. The screen planting would also benefit adjacent areas by providing a swathe of greenery, which screens traffic and reduces the impact of lighting.

5.18 The route would then pass over the Garston to Timperley Freight Line and Victoria Road. Here the existing elevated link to the SJB would be demolished, and the new route would be on a viaduct. This would open up current constricted views of the Estuary. It would improve visual and physical permeability between Widnes town centre and West Bank. For travellers on the viaduct travelling in a southerly direction this would provide the first of a sequence of elevated views over the Estuary.

5.19 The Widnes Loops Junction would be a complex, twin-level structure incorporating tollbooths on the margins of the Estuary (see SA 6.2). Its scale and geometry would be integrated into its surroundings by dense woodland scale tree and shrub planting. The land take associated with the junction would permit the introduction of segregated pedestrian / cycle routes through the landscaped areas which would replace the existing sub standard footpaths to provide improved links between the town centre and the Estuary.

5.20 The screen planting around Widnes Loops Junction would restrict southbound travellers' views to formal vistas of the Estuary. Upon crossing the St Helens Canal Bridge, the views would immediately open out to reveal the expanse of the Estuary.

5.21 The approaches to the structure which spans the tidal River comprise viaducts which would have the advantages of minimising physical impact on the saltmarshes and permitting through views from the recreation areas and recreation routes (Spike Island, Trans-Pennine Trail and Wigg Island) but would also have the disadvantage that the route and traffic upon it would be open to view from elsewhere.

5.22 The impact of this was a consideration in determining the skewed alignment for the Estuary crossing (a more direct alignment would have had greater impact and be less sympathetic in the Estuary landscape). Visually the New Bridge on a skewed alignment will be more sympathetic to the SJB. Each would retain the integrity of its immediate setting and be viewed independently from most of the conspicuous local viewpoints.

5.23 When viewed from the surrounding areas the towers and deck of the tidal crossing section of the New Bridge would be viewed in the context of changing tidal and weather conditions (which can vary enormously) and offers a changing appreciation of the bridge and varying its visual impact.

5.24 The existing Bridgewater Junction (see SA6.4) is well sited in a natural depression in the north facing slopes on the margins of the Estuary. The route approaches this junction on an alignment which would emphasise Halton Castle as a focal point for travellers. The modified junction would also remain well sited in the surrounding landform. This would provide the basis for further visual containment by supplementing the existing tree cover, which provides effective screening, to integrate the scale of the junction into its surroundings and mitigate visual impact from adjacent areas.

5.25 Between the Estuary margins and the junction the route would pass through the existing Astmoor Industrial Estate on a viaduct. The existing recreational footpath routes along the Bridgewater Canal and throughout the surrounding area would be retained.

5.26 Throughout the section of the route between the Bridgewater Junction and the M56 the modifications to the existing highway would be contained within the existing highway corridor (see SA6.5 and SA6.6). Whilst this would largely contain the visual impact of the modified route, the existing tree cover around Junction 12 of the M56 would be supplemented to further integrate the proposed amendments. Initially there would be a loss of mature tree and shrub cover throughout the Central Expressway corridor to accommodate the modified highway alignment. Subsequent replanting would become increasingly effective and eventually re-establish much of the amenity value and screening capability of the existing tree and shrub cover. In the interim period a degree of visual alteration would be provided by the acoustic barriers envisaged for the whole of this section of the route.

6. LOCATION-SPECIFIC DESIGN

Commencing with a description of the New Bridge, this section of this statement addresses the individual sections of the Project and describes how it responds to particular design needs and constraints.

6.1 The New Bridge

General Description

6.1.1 Images of the New Bridge are at SA9.1 and SA9.5.

6.1.2 The New Bridge would have a total length of 2.13km from abutment to abutment. This would consist of approximately 550m of approach spans from the north abutment to the edge of Widnes Warth Saltmarsh, and 580m from the edge of Astmoor Saltmarsh, over part of Wigg Island, over the Manchester Ship Canal and onto the south abutment within the Astmoor Industrial Estate. The new crossing over the Estuary would consist of 1,000m of cable-stayed bridge consisting of four spans supported from three towers. The towers would be faceted with a diameter of approx 10m at water level, but would taper to a rectangular section and include architectural features throughout their height.

6.1.3 Typical span lengths of the approach viaducts are 70 to 100m with an overall deck depth of around 6m. Both approach viaducts are twin separate structures supported on their own independent substructure. There would be a total of 30 piers on the saltmarshes. Each pier would be of reinforced concrete approx 2m by 5m and the height would vary between 12m (north) and 23m (south) to suit the vertical profile of the deck.

6.1.4 The three towers of the cable-stayed spans are assumed to be concrete below deck level and steel above deck level. The overall height of the towers would be around 120 to 140m above the River level.

6.1.5 The decks of the cable-stayed spans would be twin parallel decks, similar in form to the approach viaducts, connected at positions of cable stay attachment. The cable stays would be arranged in pairs in a “harp” (ie parallel) configuration.

6.1.6 The foundations are piled throughout the length of the bridge. The depth to rock is greater at the north side of the Estuary. Therefore, foundations for piers will get progressively shallower as they near the Manchester Ship Canal.

Design Quality Statement

6.1.7 Bridges are an important component of the built environment: highly visible forms that have a significant impact on their locality. The bridge design must reflect a broad range of architectural issues that are as applicable to bridges as to buildings. The architectural approach to bridge design is complementary to that of the structural engineer. Context, composition, scale and function are juxtaposed with fundamental engineering demands for safety, efficiency, economy, durability and constructability as the basis for lasting quality.

6.1.8 This is particularly true for the Mersey Gateway project, where the new road crossing of the River will transform the appearance of the Estuary setting and radically improve transport connections throughout the region. As well as reaping the benefits of the improvements to infrastructure and the expected regeneration opportunities in both Runcorn and Widnes, the North West will benefit from a major new structure, which should be of sufficient quality to become an emblem for the region.

6.1.9 Bridge design unites two sets of values that underpin modern architecture: the 'romantic' view of external appearance and the 'classical' understanding of underlying form. Beautiful, efficient bridge design should satisfy both artistic and scientific analysis to be visually legible and structurally truthful. Resolving the relationship between the two is the key to every project.

Context

6.1.10 The most memorable and successful bridge designs stand naturally within their context. They generate such an intrinsic relationship with their setting – whether coastal, rural or urban – that the view becomes unimaginable without their contribution. But the design response to context runs deeper than just the physical environment. Cultural and historic factors generate an equally powerful response, particularly as not all contexts are visually memorable. Ancient routes and future development, local sensitivities and vernacular precedent all can strongly define the 'place' of the bridge.

6.1.11 The setting for the New Bridge within the Project is a broad, open estuary whose character varies enormously depending on the weather and lighting conditions and the state of the wide-ranging tide, from mud flats with multiple streams and inlets to a wide expanse of water. This part of the Estuary is regarded as one of the most distinctive and visually appealing parts of the Mersey Valley.

6.1.12 To the west, where the Estuary narrows at the Runcorn Gap, stand two existing river crossings. The most visible of these from the towns of Widnes and Runcorn is the 1961 Silver Jubilee Bridge; a highway crossing whose design is synonymous with the North West region. The structural form is a 330m single span steel arch utilising a lattice girder form, painted in a distinctive turquoise (pale blue-green). Immediately downstream and largely obscured to views from the east by the SJB is the Grade II*-listed 1864 Aethelfleda Railway Bridge, which also utilises a lattice girder design with three wrought iron spans of 93m standing on sandstone piers.

6.1.13 On the north bank the only structure of a scale likely to rival the towers of the new crossing is the Fiddler's Ferry Power Station, whose chimney and cooling towers are major landmarks. Otherwise the scale of the surrounding landscape and townscape features, including structures such as church steeples, large industrial buildings and silos, is of a much lower order of scale. The New Bridge will be visible from considerable distances in every direction particularly from the east of the SJB (including to airborne users of the nearby Liverpool John Lennon Airport) and the visual impact of such a permanent major change to the appearance and setting of this part of the Estuary will be significant.

Composition

6.1.14 Composition is essentially an aesthetic consideration – the formal arrangement of line, shape and proportion. Critical choices including transparency, pattern, texture, cable arrangement, colour, lighting, shadow and reflection add further layers of refinement and drama.

6.1.15 However, perhaps the most important compositional concern should be the visual expression of the loading diagram, of how the structural forces 'flow'. Pared down to its most efficient, light and elegant it is this simplicity and legibility that gives good bridge designs such broad popular appeal.

6.1.16 The Reference Design proposes an unusual composition for a major cable-stayed highway bridge of three towers and two equal main spans of 300m. The central tower is shorter than the two outer towers – an arrangement that is thought to be unique – with the position of the three towers an optimum combination of span configurations and minimised impact within the Estuary. The three towers are singular and positioned centrally, with a single plane of paired stay cables in a classic 'harp' configuration. The two outer towers each have sixteen pairs of parallel stay cables and the central tower has eleven pairs, with the spacing and angle of the cable anchorages common to all three towers, although the final number of stay cables, etc. may vary.

6.1.17 Unconventional approaches on a project of this scale immediately raise questions, as the design is likely to raise issues that have not previously been encountered (which may include engineering, visual and constructional aspects). In this case, the impact on hydrodynamics and the ground conditions of the Estuary have been an important factor, which the design aims to balance using the location, number and length of spans with the size and number of discrete supports located in the River. This results in an unusual arrangement but one which, considered in aesthetic terms, has a number of benefits.

6.1.18 Principal among these is that the crossing is truly rooted in context and will be instantly identifiable with its location – an important consideration for the local economy as well as for regional identity – with the potential to become a highly visible symbol of regeneration of this part of the North West.

6.1.19 By positioning the towers in the Estuary rather than on the riverbanks, the visual effect of their scale is moderated and the composition as a whole is 'contained' within the contextual frame of the Estuary. This is unlike (say) a two-tower suspension structure or a cable-stayed design where the (taller) towers would be nearer to land and the backstays would encroach much further towards residential areas. This would have had greater visual impacts both in the Estuary and at the landings of the backstays.

6.1.20 Vertical and horizontal alignments are significant determining factors on the appearance of the bridge and how it is viewed. These are largely governed by connections into the existing highway network, other highways issues (such as gradients and sightlines associated with the road classifications) and the vertical clearance over the Manchester Ship Canal and other highway clearances on the north bank.

6.1.21 Both vertical and plan alignment are fixed within certain limits of deviation. The plan alignment includes a curved approach at each end of the main crossing, which allows for varying oblique as well as axial views of the towers and cable array, which will offer a beautiful and changing appreciation of the bridge. As with the Second Severn Crossing and Oresund Link (connecting the Danish capital of Copenhagen and the Swedish city of Malmö), this curvilinear alignment presents the design to best advantage and is particularly important in the appreciation of this essentially two-dimensional composition of single towers and single central cable arrays.

6.1.22 The subtle fall in the deck level from south to north along the crossing is unlikely to be visually noticeable, although care has been taken in the detailing of the tower bases (avoiding strong horizontal features, for example) and their connections to the deck to ensure this gradient does not create visual discontinuities as the deck level moves down the tower.

Scale

6.1.23 From intimate to heroic, understanding the importance of scale in bridge design is critical. At a grand scale the structure will become a singular object, a monumental form relating to the tidal estuary. At a human scale the physical proximity of the user guides the level of refinement, so that the hierarchy of elements extends naturally from major structural connections down to parapet and handrail fixings in a series of comprehensible steps.

6.1.24 As well as considering the scale of the bridge in its context, scale is important when the relationship of discrete elements of the bridge is considered: connections between tower and cable; between cable and deck; and between the components forming the deck, truss and parapets are all highly important (see SA7.1). In addition to the design of the bridge the visual impact of the scale of the approach spans, particularly in Widnes, has been carefully considered as the scale and proximity of the soffit – in effect a third elevation – will be particularly significant. The truss element of the deck is designed to offer an inclined outer surface which, as well as optimising the structural cross section, will reflect the changing lighting conditions of the Estuary and so animate the structure in a way that a vertical edge would not. This design also ensures the minimum width of lower deck thereby maximising daylight and sunlight to the footprint of the bridge.

Function

6.1.25 The primary function of the structure is to carry road traffic safely and efficiently across the Estuary and the design of the road alignment is guided by the design speed of the road and other highway factors, with the main 1,000m cable-stayed spans straight in plan. With the Reference Design, the passive provision for a future light rail line is made without requiring further changes to the bridge geometry, with the line required to enter and exit the bridge abutments using relatively low radius curves taken at low speed.

Icon

6.1.26 All bridges create connections, a function that is both physical and metaphorical, and when a bridge becomes the focus for development it frequently functions as a destination in itself. It is natural to consider the physical presence of a bridge as a civic or regional landmark, particularly if this can act as the signature for urban regeneration or provide identity to new development. The importance of the Mersey Gateway project is not underestimated by the client and design team – CABE have rightly referred to this as the "project of a lifetime for all those involved" – and the Reference Design has been very carefully developed and refined so as to ensure the Project's legacy is of the highest quality.

6.1.27 There seems little doubt that the unusual three tower arrangement will be instantly recognisable and is likely to become an icon for the North West. The cable-stayed form is both different from and complementary with the already iconic SJB and the design will sit comfortably in context without the new crossing undermining the status of the existing bridge.

Deck Design

6.1.28 Considerable analysis of the appearance of the main span deck design has been undertaken

to provide a structure which is both elegant and reasonably transparent as well as functional and structurally efficient (see SA7.1). The deck module is also designed to facilitate pre-casting for ease and safety of erection and the unit size must remain within tolerable weight limits.

6.1.29 The deck is formed from an upper and lower deck, respectively carrying highway and (potentially, in the future) light rail traffic. These decks are joined with inclined members to form 6m tall 'Warren' trusses, arranged in four planes. A comparative design analysis was undertaken to study the varying transparency and pattern of a number of truss structural options and the submitted proposal provides the optimum balance between the structural solution and a visual lightness demanded by the open estuary setting. The fine detailing in the structural members and in junctions between components such as cable anchorages and decks has been carefully developed with, for example, the adoption of circular inclined members to reduce visual impact and increase structural efficiency.

6.1.30 The outer edge of the deck is inclined upwards to catch the daylight and provide a clear linear element that is read continuously across the open water, and on to ground at each end of the bridge. Edge protection including a largely transparent windshield would sit to the outer edge of the deck and has been considered as part of the overall composition for their appearance as well as function.

6.1.31 The soffit view has been carefully considered as, to viewers on Wigg Island (see SA9.1.1) and other locations including the Estuary, this will be one of the dominant views. Careful detailing in the concrete formwork and the inclination of the outer planes of the trusses provide visual interest though longitudinal shadow lines and planes and through the repetitive pattern of the truss members.

Tower Design

6.1.32 As with the deck design, an extensive study into the design of the towers was undertaken, first with a comparative analysis of singular, inverted Y-form, A-form and other tower types followed by an evolutionary study of the selected singular tower in two and three-tower arrangements (see SA7.3). The singular towers have been detailed to provide a continuous form from water level to tower top, with the cross section evenly reducing with height. Clear, simple shaping of the form will provide crisp shadow lines that emphasise the slenderness of the design and these include a feature rebate into which the tower cable anchorages will be made.

6.1.33 The single central tower configuration, with a single central cable array, provides the most open aspect to drivers using the crossing and will offer extraordinary new views of the SJB, Runcorn, Widnes and the Estuary. The driver experience will be maximised by positioning the highway lighting along the centre of the bridge, away from the edges, and by providing largely transparent windshields on the outer edges. Signage for junctions to either end of the bridge will be kept as far as possible from the cable-stayed open water sections so as not to compromise the overall appearance.

6.1.34 The study also considered the heights of the three towers and established that the most successful relationship is a ratio of 1.2:1 between the twin outer and single central towers also provides both the most balanced functional composition. Although at first sight the lower centre tower is unusual, the design is guided by the constraints and will provide an elegant composition with legibility, character and which is entirely rooted in its context – without resorting to clumsy or unnecessary iconography this bridge will be instantly recognisable and identifiably of the North West.

Cable Array Design

6.1.35 There are two generic types of cable array associated with the cable-stayed bridge form: 'harp' and 'fan'. There are also combinations of the two types however certain tower and deck configurations are more suited to one or other end of the scale. For the Mersey Gateway a number of cable array options have been modelled with the various tower options (see SA7.3) and with deck connections along the centreline of the bridge (see SA7.4) as well as at the outer edge.

6.1.36 The harp arrangement comprises a series of parallel stay cables and is particularly elegant when used in a single plane along the bridge centreline; however it is not tolerant of visual irregularities in geometry. The basic geometry of the cable arrays has been developed to ensure it is uniform across the three towers with a common internal angle between arrays. This unifies the visual composition and brings additional benefits of commonality of detailing at the cable terminations. The preferred cable array, deck and tower combination comprises the paired harp array, singular towers and central line of anchor points.

6.1.37 The harp array has also been modelled with the A-frame towers and, while it is better than a fan array in this condition, the number of cables combined with the divergent angles of the tower legs creates a considerable visual interference that undermines the clarity of the cable-stay typology.

6.1.38 The fan arrangement comprises a series of stay cables, which tend towards a common focal point. There are some engineering benefits but the connections to the deck are all variable geometries. In terms of visual composition this tends to bring attention to the tops of the towers and is often used with the inverted Y tower where it is particularly elegant, although this is not applicable where the towers are so markedly variable in height. It is also suitable for use with singular towers. However, at the Mersey Gateway there is a stronger visual case for the harp so the simplicity of the tower design is not compromised.

6.1.39 The paired arrangement of stay cables may lead to one side of each tower having greater visual weight in some views. This is in addition to the variation caused in some lighting conditions where daylight and sunlight, and shadow, cause stay cables aligned towards the viewer to register differently to those aligned away. However, the simple proportional relationship between towers, cable array and deck is balanced and follows a natural order so that no one element is visually dominant.

6.1.40 The colour of the sleeves for the cables has been carefully considered, as these will vary from highly visible (especially to road users) to invisible depending on lighting conditions and proximity. The Estuary setting is similar to that of the Second Severn Crossing and not dissimilar to the Flintshire Bridge, both of which employ cable sleeves with a pale blue-green colour to good effect. The use of this colour range for the Mersey Gateway is also likely to be successful and will provide a visual reference to the similar paint colour used for the SJB. Further investigations will determine the range of available standard and non-standard colours, their costs and performance, to arrive at a final reference colour.

6.1.41 The sleeved cables will be a substantial size (approximately 350mm in diameter) and will be highly visible to road users on the bridge. Careful detailing of the anchorages between carriageways and their coordination with highway lighting columns will ensure the overall high quality of composition is maintained from macro to micro scale.

Lighting

6.1.42 Careful consideration has been given to the position of carriageway lighting. It is proposed these are mounted on poles between the carriageways to allow a maintenance regime that prevents risk of falls from the bridge. Lampposts are coordinated with stay cables to maintain a complementary rhythm. The appearance of the carriageway illumination should be considered in the estuary setting and, in particular, the effects on wildlife.

6.1.43 Consideration should be given to the positive and negative issues regarding architectural lighting of the cable array and towers – although floodlighting has been installed on SJB, architectural lighting is not generally undertaken on similar large UK projects, but taken up with enthusiasm elsewhere around the world. At the very least it would be prudent to allow for temporary, spectacular illumination of the bridge for special events through the provision of power cable routes and fixing points.

6.1.44 As well as the running and maintenance costs, consideration will need to be given to issues of light pollution and effect on wildlife. . Overall, any decision to light the bridge for architectural (as opposed to functional) reasons must use technology that is demonstrably as sustainable as possible. Architectural lighting is not part of the Project.

6.1.45 Aircraft warning lamps will be required and these should be accessible from within the towers, and include fail-safe, alarm and redundancy systems, to ease maintenance and safety issues. The below deck sections of the towers will be illuminated to assist with River navigation.

Approach Spans

6.1.46 In very large cable-stayed bridges the junction between the main cable-suspended length of deck and the approach spans is often a difficult transition, as the depth of structure and cross section changes. For the New Bridge, the design of the approach spans benefits from a constant height cross section to the main span and this allows the twin decks to flow seamlessly from main span to approaches. The Reference Design approaches will comprise independent decks on in situ concrete piers at spans varying from approximately 70m to 100m with the simple, elegant design of the piers using smaller scale features originating in the main tower design.

6.1.47 This familiar relationship is maintained in the bridge abutments which are, in themselves, quite significant structures; the height of the South Abutment at Astmoor being approximately 20m to the underside of the deck. The design of this element has been carefully developed and shaped to provide a shaped form, which terminates the tall truss design on one side, and the diverse and discrete decks of the southern approach ramps on the other. Vertical features and texture in the concrete structure are designed to coordinate with the approach piers.

6.1.48 The design of the in situ concrete abutments at each end of the new bridge allows the geometry of the main span truss deck to flow seamlessly into the shallower structures spanning St Helens Canal and Astmoor (see SA9.1.1 and SA9.1.2). This design terminates the form of the main span in a clear and logical manner and uses the length of the abutment to ensure the transition from approach to crossing is legible and gradual, as opposed to a step change at the junction between the differing height decks. The cross section geometry of the new bridge deck generates an asymmetrical triangular facet in elevation, between the vertical face of each abutment and the underside of the highway deck. As well as breaking down the visual scale of the vertical faces of the abutments – significant size structures in their own right – the use of an angular facetted geometry particularly assists with the span at the St Helens Canal, where the abutment is highly skewed in plan as the highway oversails

the canal. The facetted design suits the skewed arrangement and creates a more dynamic and elegant form than could be achieved in a simple orthogonal design. The inclined face of the abutment will be formed in flat concrete, with the vertical faces of the abutment formed in the ribbed finish specified throughout the project, so maintaining a consistent familial appearance. Through the different appearances of shadow and reflected light, the abutments will be animated and articulated as considered three-dimensional forms, which respond directly to their contexts.

Construction

6.1.49 Design of any bridge is not simply a matter of form and line. It has to be capable of being built. Very often, the construction process can impose more significant loadings upon the structure than any that it might be subjected to in service. For a large bridge – and the New Bridge is a very large bridge – how the bridge is to be constructed has a fundamental influence on the structure itself. Issues such as component size, ease of transport, ease of assembly, contribute to the final structural solution – and it is that solution that must influence the architecture. The practicalities of constructing the New Bridge are described in the Construction Methods Report.

6.2 Main Toll Plaza

6.2.1 The Reference Design assumes that the technology used to collect toll / charge payments from drivers is similar to that currently used on the Mersey Tunnels and elsewhere on the UK road network i.e. a combination of manned toll booths and unmanned tag systems located at appropriately positioned 'toll plazas'

6.2.2 The Main Toll Plaza, which would require approximately four hectares of land to accommodate the northbound and southbound tollbooths, would be at or just above existing ground level. Toll structures would be required, which are likely to comprise canopies providing sufficient headroom over tollbooths and their equipment for normal traffic use. In addition to the tolling booths, administration and staff welfare facilities will be provided; these will be located adjacent to the main tolling facilities. An indicative design for a tollbooth canopy is illustrated in SA9.3. Individual tollbooths or automatic barrier tolling technology would be sheltered by a light airy structure of this nature.

6.2.3 Specific requirements for toll collection will influence the final design of the structures and toll collection systems. Consequently, any final proposal will be subject to approval by the local planning authority. The illustrative toll plaza (plan at SA6.1 and impressions at SA9.3) is based upon that currently employed for the M6 Toll. The requirements will be for a canopy supported on a lightweight steel frame. A minimum headroom of 5.7m will be provided above each lane and the canopy will cover an approximate length of 10m centred on the axis of the toll booths. A Variable Message Signing system will be provided above each toll lane, indicating to approach drivers the status of the toll lane (open or closed) and the payment system being operated. The toll booths themselves will be spaced to provide a clear width of 3m between kerbs and include facilities for accepting some or all of cash payments, reading bank cards or recognising pre-paid TAG systems. The booths will also feature facilities for operatives. Toll collection points will also be required on the slip roads at Ditton Junction (paragraph 6.3.2 below), Widnes Loops (paragraph 6.5.2 below) and on the north approach to the SJB (paragraph 6.11.2 below). All these plazas will be of a similar form to the main toll plaza described above but with a more limited number of tollbooths. Architectural details will be consistent between all such facilities.

6.2.4 Functional requirements for tolling demand good forward visibility for approaching traffic and, preferably, a level area to permit easy braking and acceleration.

6.2.5 Extended link roads to the north and south of the Main Toll Plaza carriageway that bypass the tollbooths will be provided to allow access from Speke Road to Ditton Junction for vehicles not wishing to use the New Bridge. The north edge of the north link road will coincide with the northern edge of the existing southbound carriageway of Speke Road.

6.2.6 The principal constraint in the design of the Main Toll Plaza is the underlying contaminated ground, which has lead to a requirement to minimise the excavation and disposal of that material. The area itself if at, or just above, existing ground level and would be formed on a relatively thin layer (approximately 1 metre average thickness) of imported fill material supported on the superficial deposits that are likely to need to be subjected to ground improvement techniques to control settlement.

6.2.7 Stewards Brook and a public footpath pass beneath the existing Speke Road in culverts to the west of the proposed tolling areas. The public footpath and subway at this location would be stopped up, and the public footpath diverted around St Michaels Lane.

6.2.8 Two balancing ponds would be formed to the south of the new carriageway on either side of Stewards Brook to control the drainage water outfall flow rate into the brook. These will be incorporated into the landscaping scheme for the area, which looks to mitigate the wide-open space that is the toll plaza by absorbing it into the visual context provided by the this area

6.3 Ditton Interchange

6.3.1 Ditton Junction would be changed from a roundabout to a signal-controlled junction. It is shown at SA6.1 and structures are shown in elevation at SA8.1.

6.3.2 The new carriageway would increase in level on embankment as it approaches the new grade separated junction and would be taken over the new ground level link, between Ditton Road and Moor Lane South, on a new, two-span bridge (see SA8.1). The southbound on-slip and the northbound off-slip would also feature toll collection facilities. An embankment of up to 9m in height would be formed. This crosses land currently occupied by old industrial buildings and a scrap metal yard.

6.3.3 Ditton Road has been a long established corridor for services and many of these would need to be diverted to accommodate the revised local highway alignment. These would include diversions of electricity, gas, water, sewerage and telecommunications mains. The Scottish Power Manweb electricity substation adjacent to the Anglo Blackwell compound on Ditton Road would require relocation.

6.3.4 While the embankments on either side of the new bridge will be landscaped to soften their impact in a manner similar to that existing (see SA4.3), the new link road between Widnes and Ditton is of an urban character. It provides the link into the Freight Terminal and will form the transition to and from the slip roads for the tolled road south. There will be sets of traffic signals that must be clearly observed and drivers should not be distracted by unnecessary visual gimmickry. The chosen structure is simple providing a wide and clear vista flanked by solid framing abutments. Massing is avoided by providing the surface of the concrete walls with a finish that breaks it into defined panels. The result will be light and airy.

6.4 Victoria Road Area

6.4.1 This area is shown in plan at SA6.2. Elevations and sections are at SA8.2. Rendered images are at SA9.5.3.

6.4.2 The following new structures and earthworks would be required in this section of the works:

a) The Freight Line Bridge (see SA8.2) – a single-span bridge over the Garston to Timperley Rail Freight Line;

b) Victoria Road Viaduct (see SA8.2) – a high level, multi-span viaduct connecting the Freight Line Bridge to the edge of the Widnes Loops Junction including the crossing of Victoria Road;

6.4.3 The freight line bridge is structurally simple to avoid conflict with rail operations and to minimise possessions for construction and maintenance. The bridge itself forms a break between the embankment to the north and the Victoria Road area to the south. Visually, it needs to be unnoticed other than as a backdrop to the plaza that will be formed under the new bridge over Victoria Road.

6.4.4 The abutment walls facing the Victoria Road need to harmonise with the fabric of Widnes in this area. This can be categorised at its best as being largely red brick with fine detailing. It is proposed to face the new structures with a similar brick with the long lengths of wall being broken into tall vertical panels echoing the adjacent Waterloo Centre (see SA7.5).

6.4.5 The new bridge deck will provide a plain concrete soffit broken into four discrete spines emphasising the flow of the structure. These, in turn, will be supported on a series of plain concrete columns. Spans have been determined to provide as flexible a space as possible below the structure. Hard landscaping will be provided and it is envisaged that the space could afterwards be available for a wide variety of uses.

6.4.6 A solid parapet has been chosen to minimise traffic noise and provide some visual relief from traffic passing over Victoria Road.

6.5 Widnes Loops

6.5.1 The following new structures and earthworks would be required in this section of the works:

a) Two bridges over the new Widnes Loops Junction carriageways (see SA8.3);

b) Embankments carrying the new highway at high level;

c) A bridge to carry the Widnes Loops Junction southbound on-slip over itself (see SA8.3);

d) Toll plazas connecting the Project to the Widnes Eastern Bypass.

6.5.2 The new Widnes Loops Junction forms the link between the Mersey Gateway and the Widnes Eastern Bypass leading up to the M62 Junction 7. They will be heavily trafficked and have to provide tolling facilities much like the toll plaza referred to in Section 6.2 above. There is a need to separate and distinguish the very “highways context” loops from the urban Victoria Road area. This must be achieved visually and in terms of intrusion. A barrier will be formed by the abutment of the Victoria Road Bridge being extended by appropriate landscaping to the Garston to Timperley Freight Line to the north and behind the Waterloo Centre to the south.

6.5.3 Within the loops themselves, the structures will be relatively utilitarian and designed to minimise excavation from the contaminated underlying ground. Simple concrete box-type structures are proposed with relatively plain finishes relieved by ribbing or similar. Parapet

details will be carried through from the Victoria Road structure, being solid concrete. This will also help to mitigate traffic noise within the wider area of South Widnes.

6.5.4 The earthworks would primarily be formed from the excavated arisings from the redundant Widnes Eastern bypass supplemented by imported fill. The visual concept becomes an increasingly tall earthwork carrying the main highway through the flat expanse of the toll plaza and the looped access roads. The new structures then sit inside the earthwork piercing it to permit the passage of traffic. The slip roads on and off the main highway sit in the shoulders of the earthwork.

6.6 St Helens Canal

6.6.1 Elevations and sections are at SA8.4. A visualisation is at SA9.1.2.

6.6.2 To complete the transition from the Widnes Loops to the New Bridge requires a structure to cross the St Helens Canal and the Trans-Pennine Trail. There is also a possibility of a new access road along the north bank of the canal to link between Widnes West Bank and the proposed Development Area being taken forward in the Regeneration Strategy.

6.6.3 The new structure is integral with the north abutment of the New Bridge itself so essentially forms part of that element (see SA8.4). A slim deck is required to permit any future LRT to access the New Bridge under the new structure while still providing sufficient headroom to the canal. The columns will be spaced sufficiently widely to permit passage of an independent LRT structure between them. This results in a very light and airy structure that will be high above the canal and boulevard. A similar 'spined' structure is envisaged to that provide for Victoria Road but with simpler finishes. Plain concrete is proposed.

6.6.4 Parapet railings will be an extension to those on the New Bridge. These will be taken to link with a normal highway safety fence detail that will be carried along the edge of the slip roads within the loops.

6.6.5 During construction of the New Bridge, it is anticipated that the St Helens Canal area would form the main reception / transition area for the main bridge units. As such, it is assumed that it will be necessary to temporarily infill the canal (maintaining its drainage water transfer function) to provide a working area. On completion, the canal would be reinstated with some minor changes to the alignment. A corridor for the Trans-Pennine Trail cycle and footpath would be maintained throughout the works.

6.6.6 The landscaping scheme would link the new earthworks with the leisure facilities offered by Spike Island, the St Helens Canal and the Trans-Pennine Trail.

6.7 Astmoor

6.7.1 This area is shown in plan at SA6.4. Elevations are at SA8.4. A rendered image is at SA9.5.4.

6.7.2 The new carriageway crosses the Astmoor Industrial Estate at a height of approximately 24m above existing ground level. The area would need to be cleared of existing light industrial buildings. The deck of the new viaduct is likely to be constructed in situ on a temporary scaffold falsework (although a precast solution cannot be ruled out). On completion of the works, the area below the viaduct would be available for future development.

6.7.3 The area between the south abutment of the New Bridge and Bridgewater Junction would comprise a high level multi-span viaduct called Astmoor Viaduct (see SA8.4). This would cross the existing industrial park at considerable height linking the high level crossing of the Manchester Ship Canal with the new crossing of Bridgewater Junction.

6.7.4 This elevated structure would vary in width up to a maximum of about 60m wide before the southbound slip road splits off onto a separate alignment. The structure splits again at the point where the northbound on-slip road merges with the main line. The main line of the New Bridge would remain at high level while the two slip roads reduce in level to the south to allow the slip roads to tie in with the roundabout at Bridgewater Junction.

6.7.5 The north end of Astmoor Viaduct would land on the south side of the south abutment of the New Bridge. The south abutment of the Astmoor Viaduct would be approximately 85m wide and would be at three levels. The abutment wall would retain the end of the embankment up to Bridgewater Junction.

6.7.6 The deck of the viaduct will be kept slim to permit any future LRT to exit through the South Abutment of the New Bridge and be carried on a separate structure(s) through the supports of the viaduct. The actual route of any future LRT system is not known, but the spacing of the viaduct supports permits a reasonably free choice in the future. The deck itself would be split into four spines which follow the varying highway arrangement above. This permits the slip roads to branch from the core of the structure in a visually coherent manner.

6.7.7 The Reference Design for the viaduct would be circa 340m long and would comprise 12 spans; with approximately 20m end spans and 30m intermediate spans. The deck would be supported by reinforced concrete rectangular plate piers, approximately 2m by 5m in cross section, under each spine.

6.8 Bridgewater Junction

6.8.1 This area is shown in plan at SA6.4. Elevations are at SA8.6.

6.8.2 Like the Widnes Loops Junction, the Bridgewater Junction is a complex of structures and slip roads to provide grade separation and access to and from the Central Expressway (N-S) and the Daresbury/Bridgewater Expressways (E-W). The existing through Daresbury/Bridgewater Expressway will be closed and brought into the new roundabout. A two-level interchange is envisaged with east-west movements at the lower level and the new road linking to the Central Expressway at the higher level. The lower level would contain the gyratory system linking the slip road movements. The upper level structure is likely to be a five-span steel and concrete viaduct. Similar construction materials would be utilised for the construction of the new slip road bridges over the Bridgewater Canal. The existing bridges over the Bridgewater Canal would be removed. The existing bridges over the Daresbury/Bridgewater Expressway would be retained, although they would no longer span across a live carriageway. Retaining walls are also envisaged to separate the various movements and to limit the land take.

6.8.3 The five-span high-level bridge (at Bridgewater Junction) would be about 150m long and 27m wide (see SA8.6). The substructure is likely to be of piled foundations and reinforced concrete piers. The superstructure would be of fabricated steel or prestressed concrete beams to allow erection to fit in with the phased traffic management regime that would be required to maintain traffic flows during the works.

6.8.4 High abutment structures would be required at both ends of the new bridge. The south abutment would be on the south bank of the Bridgewater Canal. Finishes will be selected to match with other structures on the Bridgewater Canal. The abutment walls will be taken through to link with the new bridges serving the slip roads.

6.8.5 The two existing slip road bridges over the canal would need to be replaced with two new slip road bridges on the new alignment of the slip road off the new roundabout. These would be single span bridges with prefabricated steel or prestressed concrete beams used to form the decks over the canal.

6.8.6 The existing highway alignment would be re-configured to incorporate the Project and to change the priority of the existing expressways. The free flow link between the Bridgewater and Daresbury Expressways would be removed and replaced by linking into the new roundabout that would be formed at the centre of the junction.

6.8.7 The embankments between this junction and the Central Expressway would be modified for the alignment of the Mersey Gateway and the re-aligned slip roads. This tie-in between the new highway and the existing Central Expressway would be at Halton Brow.

6.9 Central Expressway

6.9.1 This area is shown in plan at SA6.5. Sections are at SA9.4.1 to SA9.4.7.

6.9.2 Improvements would be required to the alignment of the Central Expressway to cater for the increase in traffic using the route, to bring it up to current geometric standards and to manage its interface with the Mersey Gateway. These should not involve any significant earthworks other than those at Lodge Lane Junction and would be undertaken generally within the existing highway boundary.

6.9.3 The distance between existing junctions along the Central Expressway is too close to meet current merging and weaving standards with the increased traffic levels. The alignment would be modified so that the Mersey Gateway passes through this corridor with connections restricted to Bridgewater Junction and Lodge Lane Junction. This would be achieved by converting the existing hard shoulders and merge/diverge lanes into distributor lanes with no direct connection to the Mersey Gateway at Halton Brow and Halton Lea Junctions. The existing hard shoulders would need to be strengthened to carry full highway loading and road markings and barriers would be added to prevent the merging movements.

6.9.4 The footpath network around the Central Expressway was formed with the construction of Runcorn New Town in the 60's and 70's. While being a highly innovative feature for those times, design standards have since evolved and much of the system is sub-standard in terms of vertical alignment to permit access for all. Where the footpaths have to be modified to enable the works to the Central Expressway for the project, the revised footpath will be reinstated to modern design standards. This will require longer flatter approaches to all affected structures. There are four footbridges over the Central Expressway. The one immediately south of the Halton Lea junction will not require modifying – so no changes are proposed. However, the existing pedestrian route does involve crossing a live roadway at grade. Traffic volumes are predicted to rise so signal control of the crossing is proposed to improve safety. The two northernmost bridges can be retained but the changes to the roadway that they cross will necessitate additional protection (and, possibly strengthening) of the intermediate supports. The spiral ramps of the existing north bridge of the pair encroach into the new roadway. Accordingly they will need to be removed and replaced by new ramps to current standards. The southernmost footbridge will need to be replaced. This will require

improved access arrangements as described above and it is proposed to relocate the crossing on a new alignment to the north of the existing. The replacement bridge will be a single span assumed to be a tied arch installed during a short night closure of the expressway. During construction, access to the existing bridge will be maintained although some footpaths will be temporarily closed and diversions made.

6.9.5 The existing busway bridge would be replaced with a visually similar structure to the footbridge but with a wider deck to carry highway loading. The new bridge would be installed just to the south of the existing bridge in a manner similar to the new footbridge. Normal bus operating services will be maintained throughout the construction period with only minimal interruptions at the tie-ins.

6.9.6 Lodge Lane Junction (see SA6.6) would be modified to change the priority of traffic flow from the Southern Expressway to the Weston Link. The junction would be modified to make provision for dual two lanes of through traffic from the Central Expressway to the Weston Link with single lane slip roads for traffic movements to and from the Southern Expressway. These works would comprise the construction of a new single span bridge, along with modifications to the earthworks and highway alignment.

6.9.7 Weston Link Junction (see SA6.6) would be modified to change the priority of traffic flow from the northbound to the southbound section of the Weston Point Expressway. These works would use most of the exiting junction layout; however, a new slip road would be constructed on the north side of the existing Weston Link Slip Road to allow traffic to slip onto the Mersey Gateway from the northern section of the Weston Point Expressway. A new equestrian bridge and ramps would be provided to maintain the existing bridleway.

6.10 M56 Junction 12

6.10.1 This area is shown in plan at SA6.6.

6.10.2 The existing roundabout to the north of the M56 Junction 12 would be modified to include a signal controlled link directly across the centre of the existing roundabout for the main line of the new highway, leaving the outer roundabout segments for local turning traffic and for eastbound access to the M56 Junction 12. The works would comprise highway realignment and the installation of new traffic signals. A new retaining wall would be required to support the highway realignment on the south side of the roundabout.

6.11 Silver Jubilee Bridge Changes

6.11.1 With the New Bridge being built approximately 1.5 km upstream of the existing crossing and predicted to attract over 80% of the traffic crossing the river, the SJB can be restored as the local bridge serving (primarily) the local communities.

6.11.2 The SJB is a listed structure and consent is being sought for the modifications proposed. These are limited to the re-configuration of the deck-surfacing layout and no material amendments are proposed to the fabric of the structure.

6.11.3 It is intended to reconfigure the deck space on the SJB to two traffic lanes (with priority access for public transport vehicles), with the remainder being dedicated to a “Green Corridor” for pedestrians and cyclists (see SA9.2). Other motor vehicles will be permitted to use the bridge but the access routes will be down graded from high standard dual carriageways to mostly single carriageway standard roads. Approaches will feature dedicated bus lanes (to ensure public transport priority) and need only be 2-lane single carriageway otherwise. The

substandard footpath cantilevered on the east side of the bridge could then be closed if desired, although its structure would be retained as it supports services.

6.11.4 The proposed changes will have a significant impact on the areas immediate to the bridge and offer the potential to significantly up-lift the area environmentally with consequent economic spin offs. The benefits to the local community could be considerable.

6.11.5 The existing deck is considerably higher than the normal ground level near the river. Any route between Runcorn and Widnes should remain at ground level as long as possible to attract the maximum number of local users. With a user friendly path it would be quite possible to walk or cycle (say) between say the Vikings' stadium in Widnes and Runcorn's main line railway station.

6.11.6 A tolling plaza would be constructed on the existing carriageway of Queensway approximately 330m to the north of the SJB. The embankment and viaduct linking to the Widnes Eastern Bypass would be removed. The link to Ditton Junction would be downgraded to comprise just the existing slip road. The main carriageway and structures would be removed between the Queensway tollbooths and Ditton Junction.

6.11.7 The main link between the SJB and Ditton Junction (after passing through the tolling plaza) would be along the existing northbound slip road. This needs only be a two-lane single carriageway. A new signal controlled junction would be needed to replace the one-way off and on slips. The remainder of the existing dual carriageway to Liverpool can be closed to traffic and demolished. The opportunities for improved access to development, and for development to take place on redundant highway land, are being assessed in the Regeneration Strategy.

6.11.8 The Project aims to reduce the volume of traffic crossing the Borough via the SJB by transferring through traffic over the New Bridge. This will be facilitated by de-linking the existing transport network arrangements that lead to the SJB in order to reduce its potential to act as an attractive route option for non-local traffic. The SJB will then be used as part of the local transport network providing a local link across the River to satisfy the key project objectives.

6.11.9 The proposed de-linking for Widnes will allow existing bus services over the SJB to be retained, giving access into the town centre and proposed development areas in Widnes via the SJB from Runcorn. On the Widnes side the section of the Queensway highway approaching the proposed Ditton Junction and the section of the Widnes Eastern Bypass from the SJB to the proposed Widnes Loops will be made redundant.

6.11.10 On the Runcorn side, existing direct bus services between Runcorn and Widnes will remain. In terms of highways infrastructure one option being considered includes the removal of the slip road from the Weston Link Junction and the replacement of the free flow slip roads connecting the SJB and the Weston Link Junction with a roundabout. Options are currently being reviewed to incorporate results from public consultation and the emerging Regeneration Strategy, but are not included in the current planning applications.

7. ACCESS

7.1 The Project is not a destination in its own right but, nevertheless, access is a significant consideration. The linear form of the development requires that a number of different aspects of access are considered and these have been addressed as follows.

Access to and across the New Bridge

7.2 The travelling public will only be able to access the New Bridge as highway users in motorised vehicles - pedestrians and cyclists will be prohibited. There will be no lay-byes or viewing platforms on the New Bridge.

7.3 Access from the north side will be through the toll plazas at either Speke Road, Ditton Junction or on the Widnes Loops from the Widnes Eastern Bypass. Access from the south side would be achieved directly at Bridgewater Junction either by continuing on the Central Expressway (from the south) or via the Bridgewater Junction from either the Bridgewater Expressway (from the west) or the Daresbury Expressway (from the east).

7.4 Maintenance access to the carriageway will be achieved from the main running decks. Alternatively access would be possible along the lower decks. Doors at deck level will provide maintenance access to the towers with access inside the towers provided by a permanent fixed ladder system.

Access to and along the Central Expressway

7.5 The Project requires the Central Expressway and the links to the M56 to the south, to be modified to cater for the predicted increase in traffic along that corridor. Changes in priority require the arrangements at Lodge Lane Junction (with the Southern Expressway) and at Weston Link Junction (with the Weston Point Expressway) to be reconfigured to favour the route to the New Bridge. Central Expressway itself currently suffers from access points off it being too closely spaced. It is proposed that the direct access at Halton Lea be closed and two parallel distributor roads be established along each side of the expressway linking Lodge Lane Junction with Halton Brow, picking up Halton Lea en route. Traffic wishing to travel north from Halton Brow will access the Mersey Gateway via the slip roads serving the Bridgewater Junction.

7.6 South of the river, pedestrian and cycling access between the local communities is achieved through a network of dedicated footpaths and cycleways. Those routes that cross the expressway system will be maintained by either strengthening the existing facilities where necessary or providing a replacement structure. Where a pedestrian or cycling route is affected directly by the works, the amended facility will be brought up to current design standards to enable access by all and a general improvement to the network.

Access to and across the SJB

7.7 The main form of public transport in Halton is the bus. On the Runcorn side this is well provided for by dedicated bus ways. On the Widnes side this is less well developed. Between Runcorn and Widnes, buses have to fight for road space on the SJB with all other traffic. Inevitably this makes journey times difficult to predict and delays of up to half an hour (or more) are not unusual. The Project will provide priority access onto the SJB for public transport. The reduced traffic flows will lead to greater certainty in journey times that should permit a more reliable service. This is predicted to translate into greater use by the public.

7.8 At present, cycling and walking is poorly provided for across the River. Indeed, when crossing the SJB, cyclists are encouraged to dismount for their own safety. The reduction in traffic using the SJB that is predicted to result from the New Bridge permits generous space to be provided for cycling and walking. The reconfiguration of SJB (and its access arrangements) will cater for these alternative transportation modes (see SA9.2).

7.9 The reduction of traffic on the SJB also allows for the improvement in access of walking and cycling from West Bank with new links to Widnes Town Centre and the Trans-Pennine Trail. On the Runcorn side links will be improved to Runcorn Old Town and the National Cycle Network.

Access to the Estuary

7.10 Access to the Estuary on the north shore will be improved by enabling the future provision of a new boulevard along the north bank of the St Helens Canal. This is allowed for in the structural form of the proposed St Helens Canal Bridge. This boulevard would create a new link between West bank and the new Widnes Waterside development.

7.11 The existing footpath from Spike Island to Simms Cross, including the subway beneath the Widnes eastern Bypass would be stopped off. However, a new route will be provided around the western perimeter to the Waterloo Centre and then along Victoria Road to South Widnes.

7.12 On the south shore of the Estuary the Project will have no detrimental impact on access to Wigg Island.

Changes to Other Routes

7.13 At the Main Toll Plaza the public footpath across the golf course (which is currently closed) will be permanent stopped up and diverted around St Michael's Road.

7.14 The changes to Ditton Junction will allow a dedicated cycling and pedestrian route to be established along the south side of Ditton Road through the bridge carrying the new carriageway of the Mersey Gateway.

7.15 The new arrangement at Victoria Road will create an open area below the viaduct, which will significantly improve North-South links.

7.16 Access along the towpath of the Bridgewater Canal will be maintained. However, the character of the towpath local to be the new structures will be changed from two isolated bridges to a length adjacent to a high retaining wall.

7.17 The footbridges over the Central Expressway will either be retained or modified, or replaced. One footbridge will need replacing and the new structure will be constructed off-line (to minimise disruption to users). The changes to the feeder ramps and paths will be designed to meet the standards for access by all.

7.18 The existing busway crossing of the Central Expressway will require a new bridge constructed alongside the existing. Existing bus services will be maintained uninterrupted and the Works designed in a manner that permits construction avoiding disruption.

7.19 The bridle way at Weston Link will be maintained with the provision of a new equestrian bridge crossing of the new slip road.

7.20 The downgrading of Silver Jubilee Bridge to single carriageway will permit a significant improvement in the facilities for all non-motorised users, providing a corridor inside the arch rather than the current exposed external location. This provision can be extended on both sides of the river with strong links into Runcorn Old Town, towards Runcorn Station, along Queensway to Ditton and into the West Bank area. The exact detail of these routes will be dependant on the emerging de-linking and regeneration proposals, but there is opportunity to provide facilities, which are fully compliant with current standards.

7.21 The reconfiguration of the Ditton Junction as a series of signal controlled junctions will incorporate full facilities for pedestrians and cyclists to current standards, and creating a stronger link from Ditton Road towards Widnes centre, as well as along Queensway towards Silver Jubilee Bridge

7.22 The Widnes Loops approach to Mersey Gateway will sever existing footpath routes from Ashley Way and Widnes Eastern Bypass. These will be reinstated to an enhanced standard within the scheme, linking with potential canal frontage access to Widnes Waterfront and removing existing underpasses, which might be perceived as unsafe by some users.