

THE MERSEY GATEWAY PROJECT

CUMULATIVE EFFECTS ASSESSMENT

CHAPTER 21.0

CUMULATIVE EFFECTS ASSESSMENT

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21. CUMULATIVE EFFECTS ASSESSMENT

21.1 Introduction

- 21.1.1 Schedule 4 Part I of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (Ref. 1) requires that all significant environmental effects be taken into consideration, including cumulative effects. This Cumulative Effects Assessment (CEA) fulfils that requirement.
- 21.1.2 The EIA directive and regulations do not define “cumulative effects”. The Cumulative Effects Assessment Practitioners Guide (Ref. 2) defines what constitutes cumulative effects as “changes to the environment that are caused by an action in combination with other past, present and future human actions. A CEA is an assessment of those effects”. In this CEA the combined effects of different developments within the vicinity of the Mersey Gateway Project are considered. Cumulative effects occur when effects from individual projects have an additive effect to result in an effect which is greater than the individual residual impact of each development when considered in isolation. This effect may be positive or negative.
- 21.1.3 This Chapter provides an assessment of the environmental effects of the Project in synergy with the environmental effects from other projects planned within the CEA Study Area. Because “*cumulative effects can result from individually minor but collectively significant actions taking place over a period of time*” (Ref. 3), all significant residual effects from the Project will be addressed, not just those of high significance.

21.2 Approach

- 21.2.1 There is no standard methodology in the UK for CEA as part of an EIA and there are no specific requirements in the legislation as to how cumulative effects should be addressed. The EIA Directive, Schedule 4 Part I of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 and Amendment 2005 (Ref. 1.) do not specify a methodology for the assessment.
- 21.2.2 However, there are various publications suggesting how a CEA should be approached. This assessment was therefore informed by the following published guidance:
- a. Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Commission 1999) (Ref. 4);
 - b. Cumulative Effects Assessment Practitioners Guide (Canadian Environmental Assessment Agency 1999) (Ref. 2); and
 - c. Environmental Impact Assessment: A guide to good practice and procedures, A Consultation Paper (Department for Communities and Local Government 2006) (Ref. 5).
- 21.2.3 Aspects of the environment that are considered important for inclusion in a CEA may be termed Valued Ecosystem Components (VECs). It is these VECs that are then assessed for the potential to be subjected to cumulative effects. In this case the VECs are defined as the individual discipline chapters that make up the ES (i.e. Chapters 8 to 20: Surface Water Quality, Land Use, Terrestrial and Avian Ecology, Aquatic Ecology, Landscape and Visual Amenity, Cultural Heritage, Contamination of Soils, Sediments and Groundwater, Waste and Materials, Transportation, Noise and Vibration, Navigation, Local Air Quality, and Socio-Economic). Hydrology is not considered in terms of a VEC because it is treated as a pathway and not a receptor in this ES.

21.3 Study Area

- 21.3.1 To ensure all other projects were examined that could potentially have a cumulative effect with the Project, the geographical boundary for obtaining project data was determined by the VEC

with the largest geographical study area, which was Transportation. The Study Area for Transportation extended as far, or further in all directions than the study areas of all other VECs. The Study Area for this CEA is therefore the Study Area for Transportation. For details of the geographical area considered see Chapter 16: Transportation. As a result of this approach it is considered that all relevant projects have been considered, including those not in proximity to the Project, but which are linked to the Project by some other association, such as a water body.

21.4 Methodology

Collection of baseline data on other proposed developments

- 21.4.1 The Transportation Assessment (Chapter 16) for the Project required information on future developments in order to model future traffic flows. In order to rationalise which planning applications should be included in the CEA, and, to ensure consistency with the TA and the other environmental disciplines that relied upon data contained within the TA for their assessments, it was decided that the proposed developments included as part of the TA would be used, in combination with the Project, to assess cumulative effects. This is explained in the Traffic Forecasting Report that accompanies the Transport Chapter of this ES.
- 21.4.2 Those who undertook the transport modelling which informed the TA, consulted the following local authorities in order to gather information on proposed developments:
- a. Cheshire County Council;
 - b. Halton Borough Council;
 - c. Knowsley Metropolitan Borough Council;
 - d. Liverpool City Council;
 - e. St Helens Metropolitan Borough Council;
 - f. Sefton Metropolitan Borough Council;
 - g. Warrington Borough Council; and
 - h. Wirral Borough Council.
- 21.4.3 The following regional bodies were also consulted in order to verify the information:
- a. North West Regional Assembly;
 - b. Highways Agency;
 - c. Government Office North West; and
 - d. North West Development Agency.
- 21.4.4 Meetings were held with each of the authorities listed to ascertain what projects they were aware of in their areas. Further meetings then took place with individual planning and transport departments, singly or together, to gather fuller information on all projects.
- 21.4.5 There are a large number of planning applications made to local authorities in the Study Area each month. The majority of planning applications are very small, such as a house extension or change of use of a house to multiple flats, and significant environmental effects are extremely unlikely to result. It was therefore considered unnecessary to assess the effects of every planning application made within the Study Area.
- 21.4.6 For the TA, in general, residential developments of fewer than 50 units were not considered significant on an individual basis as the overall traffic growth model could reflect these relatively small-scale developments. For non-residential development or redevelopment no cut-off was applied as all of these sites may be considered significant in relation to traffic. Simple 'change of use' planning applications were also not considered. This selection of developments was also used in this CEA. Hereafter these developments will be referred to as the proposed developments.

- 21.4.7 The development information was used to generate a map showing the location of future proposed developments (Appendix 21.1). Details of these developments are summarised in Appendix 21.2.

Assessment Method

- 21.4.8 Significant effects have been identified throughout the EIA process following a series of technical assessments within Chapters 7 to 20, and are described in greater detail in these chapters. Mitigation measures will be implemented to reduce the significance of effects resulting from the Project, in some cases the effect may become insignificant and need not be considered further.
- 21.4.9 The remaining significant effects are termed the residual effects. It is only these residual effects which could result in cumulative effects when considered alongside effects from other developments. Therefore only residual effects are discussed in this assessment and are considered to be the starting point of the assessment.
- 21.4.10 Using the geographical location of the developments in relation to the Project and its associated residual effects, screening was undertaken to establish the possibility of cumulative effects occurring for each VEC. Proposed developments for which completion was recorded as “Most likely” for 2015 were considered to have the potential for construction phase and operational phase effects with the Project, due for completion 2015. Those projects for which completion was recorded as “Most likely” for 2030 were only considered to have potential for operational phase cumulative effects. Professional judgement and expertise was used to screen the proposed developments, establishing those that have the potential to produce cumulative effects. A matrix was produced, and where the potential for a cumulative effect was identified, those proposed developments, and the corresponding residual effects, were considered in more detail in the analysis of the VEC.
- 21.4.11 The precise approach taken for detailed assessment varied for each VEC. This was necessary due to the varied nature of the VECs. For each VEC expert judgement was sought from the author of the relevant chapter as to how to approach the cumulative assessment.
- 21.4.12 Where screening had established the need to look at individual developments in more detail, the available information on those developments was reviewed. All residual environmental effects identified throughout the EIA for the Project were examined individually to determine the possibility of a cumulative effect occurring. In instances where significant effects were identified, or in which the relationship between the predicted cumulative effects were unclear, the author of the relevant chapter was consulted, in order to determine the most informed level of significance. The same principles were used to assign significance as were used in the relevant Chapter. Significance is therefore based on the magnitude of that effect and the importance of the receptor.
- 21.4.13 The assessment is recorded in tables of analysis in Appendices 21.3-21.14. These summarise all the residual effects associated with the construction and operation of the Project, as taken from the individual VEC chapters. Residual effects are divided into those that are anticipated to occur during the construction phase and those which are anticipated to occur during the operational phase of the Project. Three columns evaluate the cumulative effect of each residual effect. These state what the effect is, the nature and significance of the effect, and a brief explanation of how this conclusion was reached. Unless otherwise stated the receptor is the same as that of the residual effect.
- 21.4.14 In some instances a number of residual effects contributed to a single cumulative effect. In such instances the cumulative effect columns are merged to reflect this. This formatting has also been applied in circumstances where an explanation applies to a number of cumulative effects.

- 21.4.15 The objective of the assessment was to determine if the cumulative effect is likely to be significant and if so whether the overall cumulative effect will be worse (or better, in the case of positive effects) than the expected residual effect or effects of the Project.

Scope of Study

- 21.4.16 The cumulative effects of construction and operation phase road traffic were not assessed, because the TA already assumes a traffic growth factor. This growth factor includes an estimation of additional traffic generated by other developments that are likely to occur in the area over future years. Therefore the TA inherently takes cumulative effects into account by the use of regional and, where appropriate, local growth factors to estimate future traffic flows. The residual effects given for traffic are therefore a worst case cumulative assessment. It is not necessary, for the purpose of this assessment, to segregate the effect of the Project from other developments.
- 21.4.17 As the air quality and noise assessments also utilised the transportation modelling for their assessments, the cumulative effects of construction and operational road traffic on those VECs were not assessed within this study.

Baseline and Screening

Developments

- 21.4.18 The baseline data collection undertaken resulted in details of 100 developments. The locations of these developments are shown in Appendix 21.1. For details of these developments considered as part of this CEA, please see Appendix 21.2.

Screening

- 21.4.19 The baseline to assess cumulative effects for this project is taken to be the residual effects of the Project for each VEC.
- 21.4.20 Table 21.1 shows the screening of developments to establish those considered to have the potential to produce cumulative effects by discipline. A tick indicates that the development is considered to have the potential to have cumulative effects with the corresponding VEC. These potential effects have then been examined in more detail in the Examination of Cumulative Effects by Discipline. A cross indicates that there is considered to be no potential for a cumulative effect with this VEC, and therefore these have not been examined any further.

Table 21.1 - Screening of developments with potential to have cumulative effect with the Project

| Developments | Surface Water Quality | | | | | | | | | | | |
|--|-----------------------|-------------------------------|-----------------|------------------------------|-------------------|---|---------------------|----------------|-------|------------|------------------|-------------------|
| | Land Use | Terrestrial and Avian Ecology | Aquatic Ecology | Landscape and Visual Amenity | Cultural Heritage | Contamination of Soils, Sediments & Groundwater | Waste and Materials | Transportation | Noise | Navigation | Social Economics | Local Air Quality |
| 1. Ditton Strategic Rail Freight Park | ✓ | ✓ | x | ✓ | ✓ | x | ✓ | ✓ | ✓ | x | ✓ | ✓ |
| 2.Halebank Regeneration Area | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3. Widnes Waterfront | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4. Daresbury Business Park | ✓ | x | x | x | ✓ | x | ✓ | ✓ | ✓ | x | ✓ | ✓ |
| 5. Manor Park | ✓ | ✓ | x | ✓ | ✓ | x | ✓ | ✓ | ✓ | x | ✓ | ✓ |
| 6. The Heath | x | x | x | x | ✓ | x | ✓ | ✓ | ✓ | x | ✓ | ✓ |
| 7. Stonebridge Cross | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 8. Stonebridge Business Park | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 9. Liverpool Science Park | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 10. Estuary Business Park | x | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 11. Blue Lands/Wings Leisure Park | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 12. Edwards Lane | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 13. Blue Lands South | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 14. Redrow Cressington | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 15. Evans Road | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 16. Dunlop Playing Fields | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 17. Glaxo | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 18. Paradise Street | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 19. Kings Dock | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 20. G Park (formerly Axis) | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 21. Knowsley Industrial Park | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 22. Knowsley Business Park | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 23. Kings Business Park | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 24. Prescott Business Park (Former BICC site) | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 25. North Huyton Action Area | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 26. Port of Liverpool Post-Panamax terminal | x | x | ✓ | x | ✓ | x | ✓ | x | x | ✓ | ✓ | ✓ |
| 27. Port of Liverpool - new warehousing | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 28. Liverpool John Lennon Airport - terminal extension | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 29. Woodside | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 30. Wirral International Business Park | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 31. Wirral Waters - Birkenhead Docks. | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 32. Vulcan Works Urban Village | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 33. Worsley Brow Urban Village | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 34. Lea Green Urban Village | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 35. St Helens town centre | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 36. Cowley Hill | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 37. Parkside Former Colliery | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 38. Mere Grange | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 39. North Road/Pioneer Business Park | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 40. Omega - employment site | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 41. Omega - employment site | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 42. Birchwood Park | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |

| Developments | Surface Water Quality | | | | | | | | | | | |
|---|-----------------------|-------------------------------|-----------------|------------------------------|-------------------|---|---------------------|----------------|-------|------------|------------------|-------------------|
| | Land Use | Terrestrial and Avian Ecology | Aquatic Ecology | Landscape and Visual Amenity | Cultural Heritage | Contamination of Soils, Sediments & Groundwater | Waste and Materials | Transportation | Noise | Navigation | Social Economics | Local Air Quality |
| 43. Birchwood Corporate | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 44. Gemini | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 45. Gateway | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 46. Warrington Collegiate | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 47. Sterile Technologies Clinical Waste Treatment Centre | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 48. Juniper Lane | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 49. Blocks 6 - 10, Mandarin Court (Phase 2), Centre Park | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 50. Stanford House, Garrett Field, Birchwood Science Park South | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 51. Land east of Latchford Locks | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 52. Fiddlers Ferry Power Station, Ash Processing Plant | x | ✓ | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 53. Business Homes (Phase 2 & 3), Birchwood One, Dewhu | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 54. Imco Aluminium Recycling Centre | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 55. Burtonwood Brewery, Bold Lane | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 56. WRDC Site 26, behind Spencer House, Birchwood Cent | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 57. Trident Industrial Estate, Daten Avenue, Risley | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 58. Park Royal International Hotel, Stretton Road, Stretton | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 59. Next Warehouse (Phase 1) | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 60. Behind former Lever's Distribution / Excel Logistics | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 61. Farrell Street South | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 62. Howley Quay, Howley Lane | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 63. Land off Howley Lane | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 64. Edwards Cheshire, Navigation Street | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 65. Former Tinsley Wire Works | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 66. John St/Winwick St | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 67. Cheshire Lines Warehouse | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 68. Winwick Bridge, Winwick Street / Bewsey Street | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 69. Saxon Park Off Forest Way, WA5 1DF | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 70. Junction of Wilderspool Causeway/ Gainsborough Rd | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 71. J&G Greenall's Distillery, Loushers Lane | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 72. Beers Timber & Building, Station Road | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 73. Cantilever Garden Centre, Latchford East | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 74. Kingsway South / Grange Avenue, Latchford | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 75. Cardinal Newman High School | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 76. Land at Former Carrington Wire works | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 77. Warrington Central Trading Estate, Bewsey Road | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 78. Marsden Vanplan Ltd, Longshaw Street | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 79. Former Britannia Wire Works, Bewsey Rd, Bewsey | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 80. George Howard Scrap Yard Ltd, 94 Folly Lane | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 81. Thelwall Lane, Latchford | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 82. New World Ltd, New World House, Thelwall Lane | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 83. Chapelford Urban Village (remainder) | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 84. Chapelford Urban Village Phase 4 | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 85. Chapelford Urban Village Harvard Grange (Phase 3) | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 86. Chapelford Urban Village North Square | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |
| 87. Chapelford Urban Village (Parcel 2) Chandler Place | x | x | x | x | ✓ | x | ✓ | x | x | x | x | ✓ |

| Developments | Surface Water Quality | Land Use | Terrestrial and Avian Ecology | Aquatic Ecology | Landscape and Visual Amenity | Cultural Heritage | Contamination of Soils, Sediments & Groundwater | Waste and Materials | Transportation | Noise | Navigation | Social Economics | Local Air Quality |
|---|-------------------------------|----------|-------------------------------|-----------------|------------------------------|-------------------|---|---------------------|----------------|-------|------------|------------------|-------------------|
| | 88. Phase 4, Washington Drive | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x |
| 89. GH Grappenhall Heys (Remainder) | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 90. KW8 N (Tourney Green North), Kingswood | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 91. PG11/14 Stretton Rd / Pewterspear Green Rd | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 92. PG13 Pewterspear Green Road | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 93. AC Appleton Cross | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 94. Land at Oughtrington Lane / Longbutt Lane, Lymm | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 95. Hubert Jones Tankworks Site, Birchbrook Rd, Heatley | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 96. Anson Close/Blenheim Close, Blackbrook, Poulton North | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 97. Cables Park | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 98. Port of Liverpool - central docks redevelopment | x | x | ✓ | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 99. Liverpool Football Club - new stadium | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |
| 100. The Wireworks site | x | x | x | x | ✓ | x | ✓ | x | x | x | x | x | ✓ |

Examination of cumulative effects by discipline

Chapter 8: Surface Water Quality

- 21.4.21 There are no residual effects relating to surface water quality. Therefore there is no potential for cumulative effects on surface water quality.

Chapter 9: Land Use

- 21.4.22 Potential for cumulative effects was only identified for land use types where proposed developments directly impact on land use types, which are effected by the Project. This approach was also taken in Chapter 9: Land Use for evaluating land use change.
- 21.4.23 The results of this analysis are displayed in Appendix 21.3. One cumulative effect arises from Land Use. This is severance and disruption to PRoWs across the Borough and is classified as a negative effect of moderate significance. This will occur during the construction phase and is temporary. This effect is worse than the residual effect of the Project when considered in isolation but remains within the same classification of significance.

Chapter 10: Terrestrial and Avian Ecology

- 21.4.24 The Terrestrial and Avian Ecology assessment (Chapter 10) has considered the cumulative effects of developments close to the estuary, this included developments 1, 2, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 28, 29, 30, 31, 52. The assessment considered the direct and indirect cumulative effects of the developments on the bird interests of the Upper Estuary and the European Site. Therefore this assessment is used to inform the cumulative effects on Terrestrial and Avian Ecology. The exception to this was for Great Crested Newts which were assessed separately based on the location and type of proposed developments near to sites where they were recorded. Screening therefore included all developments in the vicinity of the

Estuary, as discussed in the Appropriate Assessment and any sites in the vicinity of known Great Crested Newt locations.

- 21.4.25 The effects assessment for Chapter 10 concludes that the Project is unlikely to result in significant effects on the European Site and that this is largely as a result of the fact that there is little interaction between the bird populations in the Upper and Middle Estuary.
- 21.4.26 Although several of the development sites to the west of the Silver Jubilee Bridge were considered likely to result in potential effects on the European Site, it was concluded that there are not likely to be significant cumulative effects on the European Site. This is as a result of the population dynamics of the birds in the Upper and Middle Estuary as noted above in paragraph 21.4.25. In this sense the effects are not additive: the Project does not worsen effects elsewhere.
- 21.4.27 The assessment concluded that development 3: The Widnes Waterfront, would result in cumulative effects on the Upper Estuary as a result of human disturbance. As can be seen in Appendix 21.6 this translated into two construction phase cumulative effects of 1) Presence and movements of structures, machinery and personnel: Disturbance to breeding, roosting, feeding, loafing and migrating birds and 2) Noise and pollution by machinery and lighting: Disturbance to breeding, roosting, feeding, loafing and migrating birds. These effects were assessed as being of low negative significance. Although they remain within the same classification of significance as the residual effects, the cumulative effect is worse than the residual effect of the Project when considered in isolation.
- 21.4.28 One operational cumulative effect was identified which was the presence of new structures and permanent lighting. This was considered likely to cause disturbance to breeding, feeding, roosting and flying birds. For the Project this is a result of the New Bridge. For other nearby developments the effects are from buildings and associated lighting. This effect is considered to be of low negative cumulative significance. This effect is worse than the residual effect of the Project when considered in isolation but remains within the same classification of significance.

Chapter 11: Aquatic Ecology

- 21.4.29 Potential developments were considered to have a potential for cumulative effects if they were located near to or in waterways. The likely range of the residual effects was then qualitatively estimated using the results of modelling from Chapter 7: Hydrodynamics and Estuarine Processes and Chapter 8: Water Quality. The potential for the range of residual effects to overlap with those of other proposed developments and the overall effects on receptors was then assessed.
- 21.4.30 The results of this analysis are displayed in Appendix 21.5. One cumulative effect of a potential decrease in water quality damaging to aquatic organisms was identified, and was assessed of being of low negative significance. This effect is worse than the residual effects but remains in the same significance classification.

Chapter 12: Landscape and Visual Impact

- 21.4.31 The visual characteristics known about the proposed developments were considered in combination with the residual effects on landscape and visual amenity of the Project. The potential effect was then considered for the receptors at which each residual effect was identified.
- 21.4.32 The results of this analysis are displayed in Appendix 21.6. Although six construction phase cumulative effects were identified these were all concerning the same potential negative cumulative effect but acting on different receptors. This was a low negative effect of increased visual intrusion, which could occur if construction of proposed developments occurs the same

time as that of the Project. These effects would be worse than the residual effects but remain in the same significance classification. One operational phase effect was identified: a high positive cumulative effect on landscape and townscape through improvement to the poor quality landscape from regeneration projects and from reducing the obtrusiveness of the Project lighting. The high positive effect did not change in significance classification from the associated residual effect.

Chapter 13: Cultural Heritage

- 21.4.33 Potential for cumulative effects was identified using expert judgement of the author of the Cultural Heritage chapter and the locations of the proposed developments in relation to known archaeological and heritage features identified in Chapter 13: Cultural Heritage.
- 21.4.34 The results of this analysis are displayed in Appendix 21.7. Four cumulative effects arise from Cultural Heritage. These are the effects of construction works on the quality of setting of Listed Buildings in both the construction phase and operation phase, and effect of operation works on setting of a Conservation Area in both the construction phase and operation phase. These effects are considered to be of low negative significance. These effects are worse than the residual effects of the Project when considered in isolation but remain within the same classification of significance.

Chapter 14: Contamination of Soils, Sediments and Groundwater

- 21.4.35 The Project will not result in any residual effects relating to contamination of soils, sediments and groundwater. Therefore there is no potential for cumulative effects relating to contamination of soils, sediments and groundwater.

Chapter 15: Waste and Materials

- 21.4.36 The residual effects for waste were assessed using expert judgement considering the characteristics of the residual effects in conjunction with the possible effects of the proposed developments.
- 21.4.37 The results of the analysis are given in Appendix 21.8. Two cumulative effects were identified. In the construction phase dust from the handling of wastes is expected to have a temporary low negative effect if construction from other nearby developments occurs at the same time as construction of the Project. Also in the construction phase there is expected to be a cumulative permanent reduction in available landfill and treatment capacity. All proposed developments are considered to have the potential to generate waste and this will occur regardless of when the other developments are constructed. However it is of low negative significance because it is assumed that the waste management infrastructure within the North West Region is able to cope with any new developments that have been given planning permission in the area. Therefore the two cumulative effects are worse than the residual effects of the Project when considered in isolation but remain within the same classification of significance.

Chapter 16: Transportation

- 21.4.38 The possibility of cumulative effects relating to transport was assessed through consideration of the potential of other proposed developments to interfere with infrastructure in conjunction with the residual effects from Chapter 16: Transportation. Developments were considered to have potential to interfere with the infrastructure if they were located on or very close to PRow, the rail network or roads which would be affected during construction of the Project.
- 21.4.39 The results of the analysis are given in Appendix 21.9. Six construction phase cumulative effects were identified. In Areas A, B and C there would be the following cumulative effects: Increased traffic; Disruption to the PRow linking Cross Street and Ashley Way with Spike

Island; Disruption to the PRow linking Cross Street and Ashley Way with Spike Island, and to the cycleway on Ashley Way. In Construction Area D there would be a cumulative effect of increased traffic. In Construction Areas E, F, G there would be a cumulative effect of increased traffic.

- 21.4.40 All of the aforementioned effects would be of moderate negative significance and be temporary. Whilst all the cumulative effects are worse than the residual effects when considered in isolation, the effects are still considered to lie within the same significance category. There would be one cumulative operational effect of improved bus journey times and an increase in journey ambience for cross river trips which is considered to be of moderate positive significance and would be permanent. As the residual effects include the effects of other developments it is impossible to state how these effects compare to the Project considered in isolation. It should be noted once more that traffic growth associated with future developments is considered as part of the Transport chapter in any case. For this reason cumulative traffic effects have been assessed already.

Chapter 17: Noise and Vibration

- 21.4.41 Cumulative noise and vibration from changes in traffic levels as a result of the Project have already been assessed within Chapter 17: Noise. The residual effects for traffic in both the construction and operational phases are in fact cumulative effects as the data used in calculations included proposed developments and their associated traffic. Traffic is the cause of all residual operational effects and therefore the cumulative effect has already been assessed.
- 21.4.42 Noise from construction is assessed by counting the number of residential houses within a 100m radius of the works as the primary source of noise is unlikely to be traffic. In order to assess the potential for cumulative effects, other developments within a 200m zone around the Project are therefore considered. This means that any potential overlap of noise from construction of the Project and other developments can be identified. There were no residual effects on the construction phase relating to vibration.
- 21.4.43 The results of this analysis are given in Appendix 21.10. There is one cumulative effect during the construction phase, this is disturbance to dwellings from general construction activities and is considered to be of high negative significance. This is an increase in significance from moderate, when the Project was considered in isolation as the same receptors would potentially be exposed to noise from multiple sources of moderate negative significance. There are 11 operational residual effects, and therefore cumulative effects relating to noise. As the residual effects include the effects of other developments it is impossible to state how these effects compare to the Project considered in isolation.

Chapter 18: Navigation

- 21.4.44 The possibility of cumulative effects relating to navigation was assessed through consideration of other proposed developments with the potential to interfere with navigation in conjunction with the residual effects from Chapter 18: Navigation. The only residual effects relating to navigation are concerned with users of the River.
- 21.4.45 The results of this analysis are given in Appendix 21.11. The only development with the potential to interfere with navigation of the River is the Port of Liverpool Post Panamax terminal development (development 26) which will install additional container ship capacity. This is likely to involve considerable disruption to users of the Port of Liverpool during its construction and is awaiting public inquiry decision. However as discussed in Appendix 21.11 there is limited potential for cumulative effects as the number of users effected would be limited as the same receptor would only be affected by both developments if they navigated all the way up the river from the port; approximately 32 km. Developments 2, 3 and 10 are located close to the

navigable waterways, but are not likely to involve encroachment into the waterways during the construction phase.

- 21.4.46 Both development 26 and the Project are likely to result in temporary obstructions to navigation. Therefore one cumulative effect was identified for the construction phase of the Project which was partial obstruction to navigation. The temporary obstruction caused by the New Bridge would be caused by the cofferdams, piled jetty and amphibious craft. Details of any obstruction resulting from the construction of development 26 are not known. This cumulative effect is considered to be of low negative significance. This effect is worse than the residual effect of the Project when considered in isolation but remains within the same classification of significance. No operational cumulative effects were identified.

Chapter 19: Air Quality

- 21.4.47 Air quality receptors are considered for significant effects if they are within 200m of the Project in Chapter 19: Local Air Quality. This logic is applied to cumulative effects and receptors identified in Chapter 19 are considered to have potential for significant cumulative effects if they are within 200m of the Project and within 200m of any proposed development. This means that situations where the receptor could be affected by more than one development including the Project are identified. Expert judgement was then sought from the author of Chapter 19: Local Air Quality as to the nature and significance of any potentially cumulative effects.
- 21.4.48 The results of this analysis are given in Appendix 21.12. When considering those receptors that have been identified as part of the Local Air Quality Assessment, there are a number of receptors within 200 m of both the Project and at least one of the proposed developments listed in Table 21.1. These are proposed developments 1, 2, 3 and 6. As such, should construction of the Project and proposed development 1,2, 3 or 6 coincide, there is potential for three negative cumulative effects in terms of construction dust (low negative significance), construction traffic emissions (low negative significance) and disruption to traffic during construction (moderate negative significance). Although the cumulative effects would be worse than the related residual effects of the Project when considered in isolation they remain within the same classification of significance and would be temporary and of short term duration.
- 21.4.49 For operation phase, there are a number of receptors that lie within 200 m of proposed developments 1, 2, 3 and 6. However, since the traffic data modelled as part of the Local Air Quality assessment has included traffic from these proposed developments (as well as all the remaining developments listed in Table 21.1), the significance of cumulative effects remains unchanged from the residual significance.

Chapter 20: Socio-Economic Impacts

- 21.4.50 Socio economic effects evaluate the human effects of the residual effects identified in other chapters and from other sources not identified in other chapters. The residual effects for other chapters are therefore the starting point for many of the effects evaluated in the socio-economics assessment. For example, Chapter 9: Land Use considers direct change of land use whereas socio-economics consider the effect any land use changes have on the local population. Consequently Chapter 20: Socio Economic Impact Assessment is closely related to other chapters. There are however effects which are identified only in Chapter 20, such as those relating to job opportunities.
- 21.4.51 As a result it follows that the cumulative effects assessment is also similar to other chapters. Where for example, the health effects of noise are assessed, the cumulative effect of noise as an effect in itself is used to give the basis as to which developments may contribute to a cumulative effect. The interpretation of the data is then specifically focused on evaluating any social or economic effects, in relation to the residual effects from Chapter 20. Expert judgement was then used to assign significance to any cumulative effects identified. Where the residual

effects were identified only in Chapter 20: Socio Economic Impact Assessment, for example effects on jobs available, the potential for cumulative effects was assessed by considering the characteristics and locations of the proposed developments in conjunction with the residual effects identified in Chapter 20.

21.4.52 The results of this analysis are given in Appendix 21.13. Fifteen potential cumulative effects were identified for the construction phase, thirteen potential cumulative effects were identified for the operation phase as listed below in Table 21.2. Of particular note is the potential for regeneration and other proposed developments to bring employment to the area and an increased quality of life. The combined effect of these developments is also likely to improve public perception of Halton. A potential negative effect that is likely to accompany such population growth would be the additional pressure to community facilities, many of which, such as health centres, do not have planned expansion.

Table 21.2 - Summary of potential cumulative effects relating to Socio-Economics

| Cumulative Effect | Significance (and Nature) of Cumulative Effect |
|---|---|
| Construction Phase | |
| Change in Population structure: Increased pressure to community facilities and services (e.g. health centres, hospitals, leisure facilities). | Low negative (Temporary, Short term Indirect) |
| Change in Population structure: Increased feeling of insecurity amongst residents (associated with an influx of workers to the area) | Low negative (Temporary, Short term Indirect) |
| Change in Population structure: Economic benefits through increased expenditure within Halton (e.g. through local shops, leisure centres, private renting sector) | Low Positive (Temporary, Short term Indirect) |
| Change in Employment Opportunities: Increase in job opportunities available to local residents | High Positive (Temporary, Medium term, Direct). |
| Change in Perception of, or actual, health: Health implications through disruption in access to health facilities and increased traveller stress | Low negative (Temporary, Short term, Indirect). |
| Change in Perception of, or actual, health: Change in exercise uptake through disruptions to footpaths and cycleways with resulting effects on health | Moderate negative (Temporary, Short term, Indirect). |
| Change in Perception of, or actual, health: Creation of Project related Wastes (Dust) to Individuals and families within communities and LSOAs near to proposed developments or the Project | Low Negative (Temporary, Short term, Direct) |
| Change in Perception of, or actual, health: Creation of Project related Wastes (Dust) affecting employees working within or adjacent to proposed developments or the Project | Low Negative (Temporary, Short term, Direct) |
| Change in Perception of, or actual, health: Changes in Air quality resulting from construction traffic emissions (NO ₂ and PM ₁₀) | Low Negative (Temporary, Short term, Direct) |
| Change in Perception of, or actual, health: Changes in Air Quality resulting from road traffic emissions (NO ₂ and PM ₁₀) | Moderate Negative (Temporary, Short term, Direct) |
| Change in access to facilities and social networks: Effects to existing employers/ employees within Halton resulting from disruption from Project construction activities | Low negative (Temporary, Short Term, Direct) |
| Change in access to Further Education establishments and special schools | Low Negative (Temporary, Short term Indirect) |
| Partial obstruction to navigation by some users of the River | Low Negative (Temporary, Short term Direct) |
| Change in access to facilities and social networks: Change in daily movements by Car Users | Low Negative (Temporary, Short term Indirect) |
| Change in access to facilities and social networks: Change in daily movements by pedestrians and cyclists | Moderate negative (Temporary, Short term, Indirect) |

| Cumulative Effect | Significance (and Nature) of Cumulative Effect |
|---|---|
| Operational Phase | |
| Change in Population Structure: Regeneration attracting individuals/families to remain/ immigrate to Halton | High positive (Permanent, Long term, Indirect) |
| Change in Population Structure: Increased pressure to community facilities and services (e.g. health centres, hospitals, leisure facilities). | High negative (Permanent, Long term, Indirect) |
| Change in Employment Opportunities: Creation of new jobs for individuals within Halton | Moderate positive (Permanent, Long term, Direct and Indirect) |
| Improvement of pedestrian and cycling facilities with potential for health benefits, specifically within Riverside and Mersey. | High Positive (Permanent, Long term, Direct) |
| Improvement of pedestrian and cycling with potential for health benefits within the rest of Halton. | Moderate Positive (Permanent, Long term, Direct) |
| Change in perception or actual health and safety issues for Halton individuals Changes in Air Quality – emissions of NO ₂ to Users of the SJB and Greenway Road | High Positive (Permanent, Long term, Indirect) |
| Change in perception or actual health and safety issues for Halton individuals Changes in Air Quality – emissions of NO ₂ to Individuals and families within the rest of Halton | Moderate Positive (Permanent, Long term, Indirect) |
| Change in perception or actual health and safety issues for Halton individuals Changes in Air Quality – emissions of NO ₂ , PM ₁₀ and CO ₂ to Individuals and families within the North West | Low Positive (Permanent, Long term, Indirect) |
| Change in perception or actual health and safety issues for Halton individuals Changes in Noise and Vibration to Individuals at Weston Point and West Bank School | High positive (Permanent, Long term, Indirect) |
| Change in perception or actual health and safety issues for Halton individuals Changes in Noise and Vibration to Individuals and families residing in close proximity to the SJB | High positive (Permanent, Long term, Indirect) |
| Change in perception or actual health and safety issues for Halton individuals Changes in Noise and Vibration to Individuals and families residing in close proximity to construction areas F, G and H | Low negative (Permanent, Long term, Indirect) |
| Change in access to facilities and social networks: Improved access routes for pedestrians and cyclists | High positive (Permanent, Long term, Indirect) |
| Change in access to facilities and social networks: Disruption and closure of footpaths and cycleways | Low Negative (Permanent, Long term Direct) |

21.4.53 In almost all instances the cumulative effects identified increased the significance compared to the related residual effect but not sufficiently to raise it to a higher band of significance. There are two exceptions. Firstly a 'change in exercise uptake through disruptions to footpaths and cycleways' with resulting effects on health, and secondly a 'change in access to facilities and social networks: a change in daily movements by pedestrians and cyclists', both increased from low negative to moderate negative significance.

21.5 Mitigation

21.5.1 This cumulative effects assessment has considered residual effects from the VECs. The residual effects for this Project by definition are those that remain after taking account of any practical mitigation. Therefore mitigation is beyond the control of the Project. Mitigation could be achieved through ensuring that the proposed developments considered also mitigate their impacts as far as is feasible. The majority of significant cumulative effects would occur only if construction of the Project and other developments coincided. The Council could potentially influence the timing of construction works so that multiple construction works do not affect the same areas simultaneously. In addition the negative socio-economic cumulative effects could be reduced if public services (i.e. Schools, GPs and Health Centres) were improved or more

services provided to accommodate the demand resulting from the expected increase in population.

21.6 Conclusions

21.6.1 A number of significant cumulative effects have been identified. A summary of the significant cumulative effects is given in Table 21.3, below.

Table 21.3 - Summary of Cumulative Effects

| VEC | Cumulative Effect | Significance of related Project Residual Effect | Significance (and nature) of Cumulative Effect |
|-------------------------------|--|---|---|
| Construction Phase | | | |
| Land Use | Severance and Disruption to PRowS across the Borough | Low Negative Significance | Moderate Negative (Temporary, Short Term, Direct) |
| Terrestrial and Avian Ecology | Presence and movements of structures, machinery and personnel: Disturbance to breeding, roosting, feeding, loafing and migrating birds | Low Negative Significance | Low Negative (Short term, temporary) |
| Terrestrial and Avian Ecology | Noise and pollution by machinery and lighting: Disturbance to breeding, roosting, feeding, loafing and migrating birds. | Low Negative Significance | Low Negative (Short term, temporary) |
| Aquatic Ecology | Potential decrease in water quality damaging to aquatic organisms | Low Negative Significance | Low Negative (Temporary, Medium term, Direct) |
| Landscape and Visual Amenity | Intermediate area receptors 1: Visual change (middle distance views). | Low Negative Significance | Low Negative (Short term, Temporary, Direct) |
| Landscape and Visual Amenity | Intermediate area receptors 2: Visual change (Middle distance views). | High Negative Significance | High Negative (Short term, Temporary, Direct) |
| Landscape and Visual Amenity | Intermediate area receptors 3: Visual change (middle distance views). | Low Negative Significance | Low Negative (Short term, Temporary, Direct) |
| Landscape and Visual Amenity | Local area receptors 1: Visual change (local views). | Part low negative part moderate negative. | Low Negative (Short term, Temporary, Direct) |

| VEC | Cumulative Effect | Significance of related Project Residual Effect | Significance (and nature) of Cumulative Effect |
|------------------------------|--|---|--|
| Landscape and Visual Amenity | Local area receptors 2: Visual change (local views). | Part moderate negative part high negative. | Moderate Negative (Short term, Temporary, Direct) |
| Landscape and Visual Amenity | Local area receptors 3: Visual change (local views). | Low Negative Significance | Low Negative (Short term, Temporary, Direct) |
| Cultural Heritage | Effect of construction works on the quality of setting of Listed Buildings | Low Negative Significance | Low Negative (Temporary, Short Term, Indirect) |
| Cultural Heritage | Effect of construction works on setting of a Conservation Area | Low Negative Significance | Low Negative (Temporary, Short Term, Indirect) |
| Waste and Materials | Dust from handling of wastes | Low Negative Significance | Low Negative Significance (Short term, Temporary, Direct) |
| Waste and Materials | Reduction in available landfill and treatment capacity | Low Negative Significance | Low Negative Significance (Short term, Permanent, Direct) |
| Transportation | Areas A, B & C The cumulative effects of traffic generated by construction operations, and waste disposal activities together with traffic management and phasing of the works will result in delays to vehicular traffic. | Moderate Negative Significance | Moderate Negative (Short term, Temporary, Direct) |
| Transportation | Areas A, B & C Disruption to the PRow linking Cross Street and Ashley Way with Spike Island. | Moderate Negative Significance | Moderate Negative (Short term, Temporary, Direct) |
| Transportation | Areas A, B & C Disruption to the PRow linking Cross Street and Ashley Way with Spike Island, and to the cycleway on Ashley Way. | Moderate Negative Significance | Moderate Negative Significance (Short term, Temporary, Direct) |
| Transportation | Areas A, B & C Effect on the Freight Line. | Low Negative Significance | Low Negative (Short term, Temporary, Direct) |

| VEC | Cumulative Effect | Significance of related Project Residual Effect | | Significance (and nature) of Cumulative Effect |
|---------------------|--|---|----------|---|
| Transportation | Area D Traffic generated by construction and waste disposal activities together with the cumulative effects of construction and waste disposal activities at other works areas will result in delays to vehicular traffic. | Moderate Significance | Negative | Moderate Negative (Short term, Temporary, Direct) |
| Transportation | Areas E, F, G and H Delays to vehicular traffic as a result of the following: Increase in traffic as a result of construction and waste disposal activity and phasing of the construction work at Astmoor Junction. Construction of distributor roads along the Central Expressway between Halton Brow and Halton Lea. Construction of Western link junction and Weston Point Expressway junction. | Moderate Significance | Negative | Moderate Negative (Short term, Temporary, Direct) |
| Noise and Vibration | Disturbance to dwellings from general construction activities | Moderate Significance | Negative | High Negative (Temporary, Short Term, Direct) |
| Noise and Vibration | Noise from general construction activities including canal bridge | Moderate Significance | Negative | Moderate Negative (Temporary, Short Term, Direct) |
| Navigation | Partial obstruction to navigation | Low Significance | Negative | Low Negative (Temporary, Short term, Direct) |
| Local Air Quality | Construction Dust | Low Significance | Negative | Low Negative (Temporary, Short term, Direct) |
| Local Air Quality | Construction traffic emissions | Low Significance | Negative | Low Negative (Temporary, Short term, Direct) |
| Local Air Quality | Disruption to Traffic during Construction | Moderate Negative | | Moderate Negative (Temporary, Short term, |

| VEC | Cumulative Effect | Significance of related Project Residual Effect | Significance (and nature) of Cumulative Effect |
|-----------------|---|---|--|
| | | Significance | Indirect) |
| Socio Economics | Change in Population structure: Increased pressure to community facilities and services (e.g. health centres, hospitals, leisure facilities). | Low Negative Significance | Low negative (Temporary, Short term Indirect) |
| Socio Economics | Change in Population structure: Increased feeling of insecurity amongst residents (associated with an influx of workers to the area) | Low Negative Significance | Low negative (Temporary, Short term Indirect) |
| Socio Economics | Change in Population structure: Economic benefits through increased expenditure within Halton (e.g. through local shops, leisure centres, private renting sector) | Low Positive Significance | Low Positive (Temporary, Short term Indirect) |
| Socio Economics | Change in Employment Opportunities: Increase in job opportunities available to local residents | High Positive Significance | High Positive (Temporary, Medium term, Direct). |
| Socio Economics | Change in Perception of, or actual, health: Health implications through disruption in access to health facilities and increased traveller stress | Low Positive Significance | Low Negative (Temporary, Short term, Indirect). |
| Socio Economics | Change in Perception of, or actual, health: Change in exercise uptake through disruptions to footpaths and cycleways with resulting effects on health | Low Negative Significance | Moderate negative (Temporary, Short term, Indirect). |
| Socio Economics | Change in Perception of, or | Low Negative Significance | Low Negative (Temporary, Short term, |

| VEC | Cumulative Effect | Significance of related Project Residual Effect | | Significance (and nature) of Cumulative Effect |
|-----------------|--|---|----------|---|
| | actual, health: Creation of Project related Wastes (Dust) to Individuals and families within communities and LSOAs near to proposed developments or the Project | | | Direct) |
| Socio Economics | Change in Perception of, or actual, health: Creation of Project related Wastes (Dust) affecting employees working within or adjacent to proposed developments or the Project | Low Significance | Negative | Low Negative (Temporary, Short term, Direct) |
| Socio Economics | Change in Perception of, or actual, health: Changes in Air quality resulting from construction traffic emissions (NO ₂ and PM ₁₀) | Low Significance | Negative | Low Negative (Temporary, Short term, Direct) |
| Socio Economics | Change in Perception of, or actual, health: Changes in Air Quality resulting from road traffic emissions (NO ₂ and PM ₁₀) | Moderate Significance | Negative | Moderate Negative (Temporary, Short term, Direct) |
| Socio Economics | Change in access to facilities and social networks: Effects to existing employers/ employees within Halton resulting from disruption from Project construction activities | Low Significance | Negative | Low negative (Temporary, Short Term, Direct) |
| Socio Economics | Change in access to Further Education establishments and special schools | Low Significance | Negative | Low Negative (Temporary, Short term Indirect) |
| Socio Economics | Partial obstruction to navigation by some users of the River | Low Significance | Negative | Low Negative (Temporary, Short term Direct) |

| VEC | Cumulative Effect | Significance of related Project Residual Effect | Significance (and nature) of Cumulative Effect |
|-------------------------------|--|---|---|
| Socio Economics | Change in access to facilities and social networks: Change in daily movements by Car Users | Low Significance Negative | Low Negative (Temporary, Short term Indirect) |
| Socio Economics | Change in access to facilities and social networks: Change in daily movements by pedestrians and cyclists | Low Significance Negative | Moderate negative (Temporary, Short term, Indirect) |
| Operation Phase | | | |
| Terrestrial and Avian Ecology | Presence of new structures and permanent lighting: disturbance to breeding, feeding, roosting and flying birds | Low Significance Negative | Low Negative (Long-term, Permanent, Direct) |
| Landscape and Visual Amenity | Intermediate area receptors 2: Effect on landscape and townscape | Moderate negative, low negative, part moderate positive part high positive. | High Positive Significance (Long term, Permanent, Direct) |
| Cultural Heritage | Effect of operation works on the quality of setting of Listed Buildings | Low Significance Negative | Low negative (Permanent, Indirect) |
| Cultural Heritage | Effect of operation works on setting of a Conservation Area | Low Significance Negative | Low Negative (Permanent, Short Term, Indirect) |
| Transportation | Improved journey times and an improved journey ambience for strategic trips. | High Positive Significance | High Positive (Permanent, Long-term, Direct) |
| Transportation | Improved journey times and an increase in journey ambience for cross-river trips. | High Positive Significance | High Positive (Permanent, Long-term, Direct) |
| Transportation | Improved bus journey times and an increase in journey ambience for cross-river trips. | High Positive Significance | High Positive (Permanent, Long-term, Direct) |
| Transportation | Support of the implementation of Halton wide Sustainable Transportation Strategy enhancement | High Positive Significance | High Positive (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- | Low Negative | Low Negative |

| VEC | Cumulative Effect | Significance of related Project Residual Effect | Significance (and nature) of Cumulative Effect |
|---------------------|---|---|--|
| | Area 1 – industrial and commercial areas | Significance | (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise Area 1 – St Helens Canal | Moderate Negative Significance | Moderate Negative (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 2 – residential areas adjacent to northern approach to SJB | Moderate Positive Significance | Moderate Positive (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 3 – SPA | High Positive Significance | High Positive (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 4 – residential areas adjacent to the southern approach to SJB | Moderate Positive Significance | Moderate Positive (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 5 – residential areas adjacent to the Weston Point Expressway | Moderate Positive Significance | Moderate Positive (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 6 – Wigg Island | High Negative Significance | High Negative (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 6 – Manchester Ship Canal | Moderate Negative Significance | Moderate Negative (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 7 – Astmoor industrial estate | Low Negative Significance | Low Negative (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 8 – residential areas adjacent to Bridgewater junction | Low Negative Significance | Low Negative (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 8 – Bridgewater Canal | Moderate Negative Significance | Moderate Negative (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 9 – residential areas adjacent to the Central Expressway | Low Negative Significance | Low Negative (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- Area 10 – residential areas adjacent to the Weston link to M56 | Low Negative Significance | Low – Negative (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise | Low Positive Significance | Low Positive (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise- | Low Positive Significance | Low Positive |

| VEC | Cumulative Effect | Significance of related Project Residual Effect | Significance (and nature) of Cumulative Effect |
|---------------------|---|---|--|
| | Cavendish School – high importance | | (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise-West Bank Primary School | High Positive Significance | High Positive (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise-Weston Point Community School | High Positive Significance | High Positive (Permanent, Long-term, Direct) |
| Noise and Vibration | Road traffic noise-Woodside Primary School | Low Negative Significance | Low Negative (Permanent, Long-term, Direct) |
| Local Air Quality | Silver Jubilee Bridge, levels of NO ₂ and PM ₁₀ | High positive significance (NO ₂) Moderate positive significance (PM ₁₀) | High positive significance (NO ₂) Moderate positive significance (PM ₁₀) (Long term, Direct) |
| Local Air Quality | A557 Weston Point Expressway, levels of NO ₂ and PM ₁₀ | Moderate positive significance (NO ₂) Low positive significance (PM ₁₀) | Moderate positive significance (NO ₂) Low positive significance (PM ₁₀) (Long term, Direct) |
| Local Air Quality | Changes in regional NO _x , PM ₁₀ and CO ₂ emissions from the modelled road network | Low Positive Significance | Low Positive Significance (Long term, Direct) |
| Socio Economics | Change in Population Structure: Regeneration attracting individuals/ families to remain/ immigrate to Halton | High Positive Significance | High Positive (Permanent, Long term, Indirect) |
| Socio Economics | Change in Population Structure: Increased pressure to community facilities and services (e.g. health centres, hospitals, leisure facilities). | High Negative Significance | High Negative (Permanent, Long term, Indirect) |
| Socio Economics | Change in Employment Opportunities: Creation of new jobs for individuals within Halton | Moderate Positive Significance | Moderate positive (Permanent, Long term, Direct and Indirect) |
| Socio Economics | Improvement of pedestrian and cycling facilities with potential for health benefits, specifically within Riverside and Mersey. | High Positive Significance | High Positive (Permanent, Long term, Direct) |

| VEC | Cumulative Effect | Significance of related Project Residual Effect | Significance (and nature) of Cumulative Effect |
|-----------------|---|--|---|
| Socio Economics | Improvement of pedestrian and cycling with potential for health benefits within the rest of Halton. | Moderate Positive Significance | Moderate Positive (Permanent, Long term, Direct) |
| Socio Economics | Change in perception or actual health and safety issues for Halton individuals Changes in Air Quality – emissions of NO ₂ to Users of the SJB and Greenway Road | High Positive Significance | High Positive (Permanent, Long term, Indirect) |
| Socio Economics | Change in perception or actual health and safety issues for Halton individuals Changes in Air Quality – emissions of NO ₂ to Individuals and families within the rest of Halton | Moderate Positive Significance | Moderate Positive (Permanent, Long term, Indirect) |
| Socio Economics | Change in perception or actual health and safety issues for Halton individuals Changes in Air Quality – emissions of NO ₂ , PM ₁₀ and CO ₂ to Individuals and families within the North West | Low Positive Significance | Low Positive (Permanent, Long term, Indirect) |
| Socio Economics | Change in perception or actual health and safety issues for Halton individuals Changes in Noise and Vibration to Individuals at Weston Point and West Bank School | High Positive Significance | High positive (Permanent, Long term, Indirect) |
| Socio Economics | Change in perception or actual health and safety issues for Halton individuals Changes in Noise and Vibration to Individuals and families residing in close proximity to the SJB | High Positive Significance | High Positive (Permanent, Long term, Indirect) |
| Socio Economics | Change in | Low Negative | Low negative |

| VEC | Cumulative Effect | Significance of related Project Residual Effect | Significance (and nature) of Cumulative Effect |
|-----------------|--|---|--|
| | perception or actual health and safety issues for Halton individuals Changes in Noise and Vibration to Individuals and families residing in close proximity to construction areas F, G and H | Significance | (Permanent, Long term, Indirect) |
| Socio Economics | Change in access to facilities and social networks: Improved access routes for pedestrians and cyclists | High Positive Significance | High positive (Permanent, Long term, Indirect) |
| Socio Economics | Change in access to facilities and social networks: Disruption and closure of footpaths and cycleways | Low Negative Significance | Low Negative (Permanent, Long term Direct) |

21.6.2 Although almost all the construction phase effects are negative, as can be seen the majority of these would occur during the construction phase and be temporary. In addition very few of the cumulative effects increased in significance sufficiently to warrant being classified in the next significance class. In many instances whether they occur at all depends on the timing of other construction projects.

21.6.3 Operational cumulative effects are mainly positive. The mitigation of any cumulative effects is outside of the control of the Project and opportunities rest with the Council and the individual proposed developments to minimise the effects.

21.7 References

- Ref 1 Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 and Amendment 2005.
- Ref 2 Hegmann, G., C. Cocklin, R. Creasey, S. Dupuis, A. Kennedy, L. Kingsley, W. Ross, H. Spaling & D. Stalker, 1999. Cumulative Effects Assessment Practitioners Guide. The Cumulative Effects Assessment Working Group AXYS, Environmental Consulting Ltd. Canadian Environmental Assessment Agency.
- Ref 3 Council on Environmental Quality. 1978. National Environmental Policy Act.
- Ref 4 Walker, L.J. & J. Johnston, 1999. Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions. European Commission.
- Ref 5 Department for Communities and Local Government, 2006. Environmental Impact Assessment: A guide to good practice and procedures.