Amey

Infrastructure Cost report

Places for Everyone New Carrington Allocation scheme

CO00201703-AMEY-HGN-NCIC-RP-QS-0001 Rev. 1

07/02/2025

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1. Summary Overview

1.1 Introduction

Trafford Metropolitan Borough Council (TMBC) engaged Amey to provide cost estimates for future highway, public transport and active travel infrastructure for the Places for Everyone (PfE) New Carrington allocation scheme - see Fig. 1.1 below. The first stage of the Masterplan, the Delivery Strategy, is currently being prepared by WSP and Deloitte, as commissioned by TMBC.

The PfE New Carrington allocation has been identified for significant housing and employment development in the PfE plan - see Policy JPA30.

This report provides estimated costs of the highway and active travel infrastructure within the development area which TMBC will use to inform the infrastructure funding mechanism for the site and to identify proportionate developer contributions across the site.

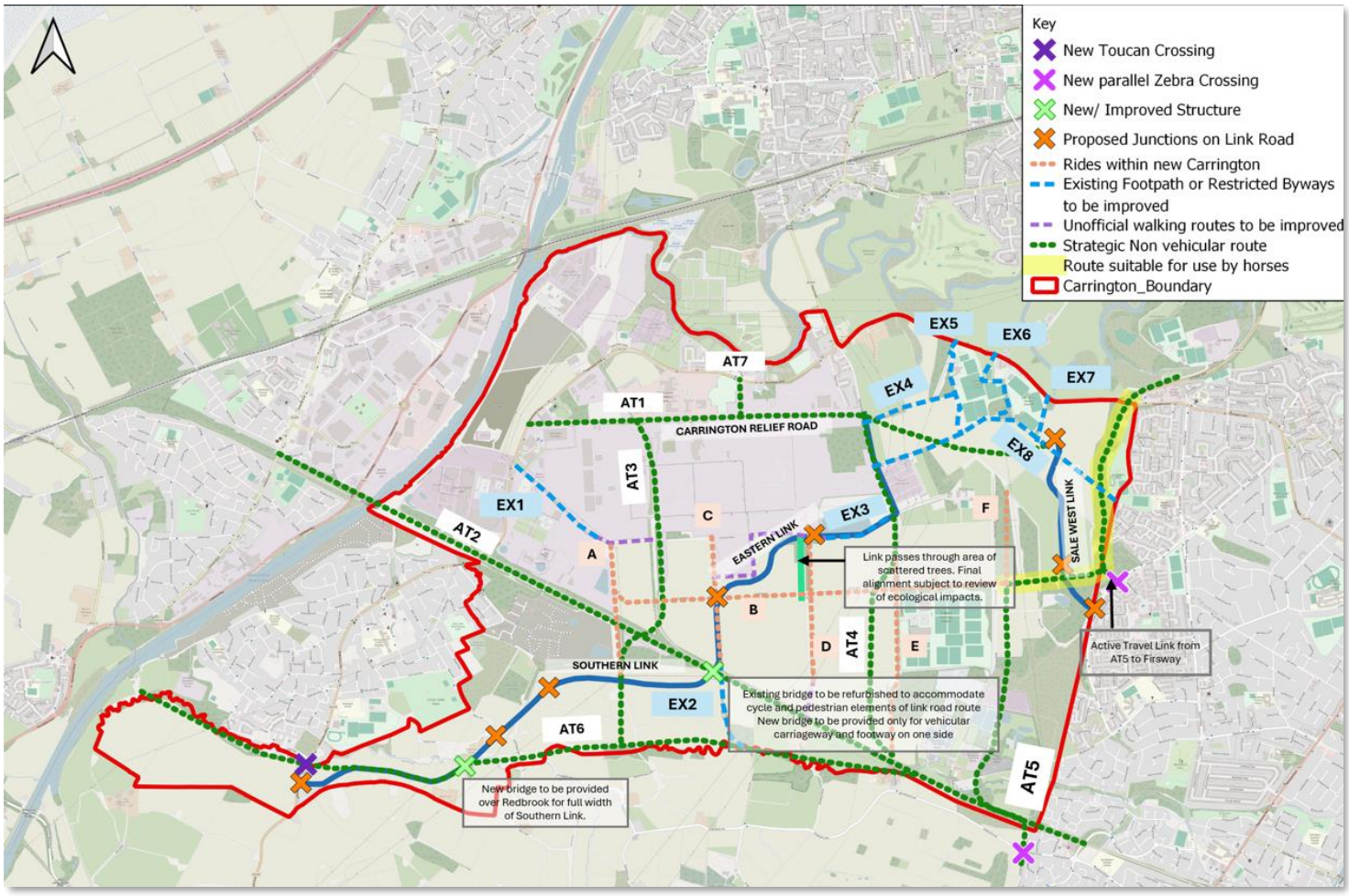


Figure 1.1 *– PfE New Carrington link roads and active travel routes (WSP)*

1.2 Highway, Public Transport and Active Travel Development Cost Estimates

The methodology used to determine the subject future highway costs were determined using empirical methods, i.e. itemised spreadsheets using calculated material volumes with current (July 2024) cost rates as used by Amey's Transport Infrastructure (TI) unit within TMBC's delivery framework. Three 'optimism bias' rates are also included to provide TMBC with high, medium and low costing options.

A summary of highway and active travel costs is provided in Table 1.1 below. Chapter 2 provides a break-down of highway related costs. Public transport costs (on-carriageway bus stops with shelters) are included within the highway cost estimates.

The principal construction materials proposed for the link roads align with current highway standard practice, i.e. bituminous / crushed stone highway & footway pavements, drainage pipes, kerbs & gullies, imported fill, steel column LED street lighting, semi-mature trees and grass seeded topsoil in the verges (as proposed by WSP).

Nominal rates have been applied for 'Preliminary items' and 'Traffic Management costs' of 10% and 5% of total costs, respectively.

An options analysis to reduce the carbon footprint of the proposed works may result in alternate materials or volumes being selected, thus altering the estimated costs herein. In this regard, Amey recommends conducting value engineering and carbon assessments as part of any future design.

Highways & Active Travel Section Name	Notes	Approximate Length (km)	Total
Sale West link road	6.5m wide single carriageway with two 2.5m wide footways and a 3m wide cycle lane	1.2	£5,070,366.98
Eastern link road	6.5m wide single carriageway with two 2.5m wide footways and a 3m wide cycle lane. Finished surface is elevated 1m above NGL.	2.55	£12,846,518.20
Southern link road	6.5m wide single carriageway with two 2.5m wide footways and a 3m wide cycle lane	2.85	£11,062,428.12
Off-site junction improvements	WH3, WH5, WH7, WH8 (See Section 2.5)	Varies	£1,119,320.95
Existing footpath improvements	EX1, EX2, EX3, EX5, EX6, EX7, EX8 (see Fig. 1.1)	5.2	£1,931,959.35
Existing equestrian route improvements	Equestrian 'ride' routes A, B, C, D, F (see Fig. 1.1)	5.18	£1,957,626.37
Active travel links	AT2, AT3, AT4, AT5, AT6 inc. 2 x zebra and 2 x Toucan crossings (see Fig. 1.1)	17.35	£10,573,079.81
		Sub Total	**£44,561,299.79**
Optimism Bias - Low	3%	£1,336,838.99	**£45,898,138.79**
Optimism Bias - Medium	24%	£10,694,711.95	**£55,256,011.74**
Optimism Bias - High	44%	£19,606,971.91	**£64,168,271.70**

Bridge Structures Section Name	Notes	Length (m)	Total
AT 2 - Greenway	Refer to Trafford Greenway Feasibility Assessment Report - Structures WJP1/3 to WJP1/18	varies	£2,864,614.30
Red Brook (Southern Link Road)	Highway bridge	40	£3,200,000.00
Greenway (Eastern Link Road)	Highway bridge	37	£2,035,000.00
		Sub Total	**£8,099,614.30**
Optimism Bias - Low	2%	£161,992.29	**£8,261,606.59**
Optimism Bias - Medium	13%	£1,052,949.86	**£9,152,564.16**
Optimism Bias - High	24%	£1,943,907.43	**£10,043,521.73**

Optimism Bias	Grand Totals
Low	**£54,159,745.38**
Medium	**£64,408,575.91**
High	**£74,211,793.44**

***Table 1.1** – Headline cost estimates (July 2024) of all proposed highway and active travel works including optimism bias*

1.3 Optimism Bias

When forecasting cost and programme on highway infrastructure schemes it has been identified that adjustments need to be included to cover unknown issues or unexpected occurrences. The following is taken from the Green Book (2022) which is guidance issued by HM Treasury on how to appraise policies, programmes and projects: *'there is a demonstrated, systematic, tendency for project appraisers to be overly optimistic. To redress this tendency appraisers should make explicit, empirically based adjustments to the estimates of a project's costs, benefits, and duration. The main aims of applying optimism bias are to make adjustments to estimates of capital and operating costs, benefits values and time profiles and to provide a better estimate of the likely capital costs and work duration.'*

Optimism bias has been included in the costs shown in Table 1.1 above with low, medium and high adjustments applied, i.e. 3%, 24%, 44% for highway and active travel work and 2%, 13% and 24% for the bridge structures, as recommended by the 'Green Book' (p.2 - HM Treasury).

Discussion supporting the optimism bias rates applied to the scheme at this, the concept stage, is provided in Section 4.3.

1.4 Risk

As with any infrastructure development an element of risk is normal. In this regard a quantitative risk register has been developed which identifies and rates each forecast risk.

Total scheme risk identified to date is £ 19,149,128.93

It should be noted that the cumulatively most expensive risk relates to programme delay. Given the current 2.6% RPI annual rate of inflation a 12-month delay for the entire PfE New Carrington highway and active travel infrastructure is likely to add £1.91m.

Please refer to Appendix A to view the quantitative risk register.

1.5 Staged Development

The Carrington Masterplan proposes that staged development of PfE New Carrington highway and active travel infrastructure should occur to enable incremental adjacent land development. Section 2.4 of this report shows the proposed phasing plans and Section 2.6 provides estimated cost forecasts at 5 yearly intervals from 2030 to 2045, based on official and assumed rates of RPI inflation.

1.6 Inclusions

The costs shown in Table 1.1 cover core highway corridor development material supply and construction costs with rates based on Amey TI's July 2024 (Q2) figures. SPONS (2022) was also referenced for irregular items, e.g. new highway bridges.

Measurements of pond sizes and landscaping external to the highway corridors are not presently available. In this regard Amey have assumed that 5% of the link road and active travel costs be attributed to each of these items.

1.7 Exclusions

This report quantifies the core highway and active travel materials for supply and construction as expected during 'normal' works activities; however, it excludes the following items and activities due to unknown factors associated with the PfE New Carrington development during its concept stage.

Exclusions	Reason
Land acquisition/ CPO	Land requirements are currently unknown
Biodiversity Net Gain (BNG)	Impact and extents are currently unknown
Environmental enhancements/ mitigation	Impact and extents are currently unknown
All design & planning costs	Development staging will inform
Private and public statutory undertaker diversions and new installation costs	Accounted for in other infrastructure costs for the Masterplan
Statutory approvals	Accounted for in other administrative costs for the Masterplan
Noise reduction and air quality mitigation measures	Extents are currently unknown
Maintenance costs	E.g. carriageways, landscaping, drainage, traffic signals, street lighting
Farm/ private property access crossings	Locations are yet to be confirmed
Supervision of construction costs	To be identified in PCI and tender
Licencing and permits	Accounted for in other administrative costs for the Masterplan
Legal fees	Accounted for in other administrative costs for the Masterplan
Construction risk	To be identified in PCI and tender
EX4 existing footway/ Restricted Byway	This is improved as part of CRR scheme
AT1 – future footways and cycleways within the CRR scheme	These are provided as part of CRR scheme
AT7 as it already has hardstanding and street lighting, so no significant additional costs required	Confirmed by WSP
Equestrian Ride E	Not required due to existing equestrian provision - confirmed by WSP
Street lighting within equestrian 'rides' and existing footpath / restricted byway improvements to be excluded.	As per WSP advice to omit street lighting from equestrian rides, existing footpaths / restricted byways. See Section 3.2, Note 4.
Approximately 250m length of Common Lane (which forms a part of EX1)	Excluded from costing as the existing pavement in this section appears to be in fair condition; however, TMBC direction is sought on how this section will either be upgraded to a mixed-use highway or downgraded to an AT route

***Table 1.2** – Exclusions from cost estimates*

2. Future PfE New Carrington Highway Network

2.1 Introduction

The PfE New Carrington allocation will entail the development of around 5,000 homes and 350,000 sqm of commercial, industrial and warehouse sites (introduced incrementally until around 2042). This expansion represents a key component of the Places for Everyone (PfE) Joint Development Plan Document (DPD). PfE is the strategic spatial plan for nine of the ten boroughs within GM which sets out the strategic planning policy framework.

The PfE New Carrington development area is shown in Fig. 2.1 below.

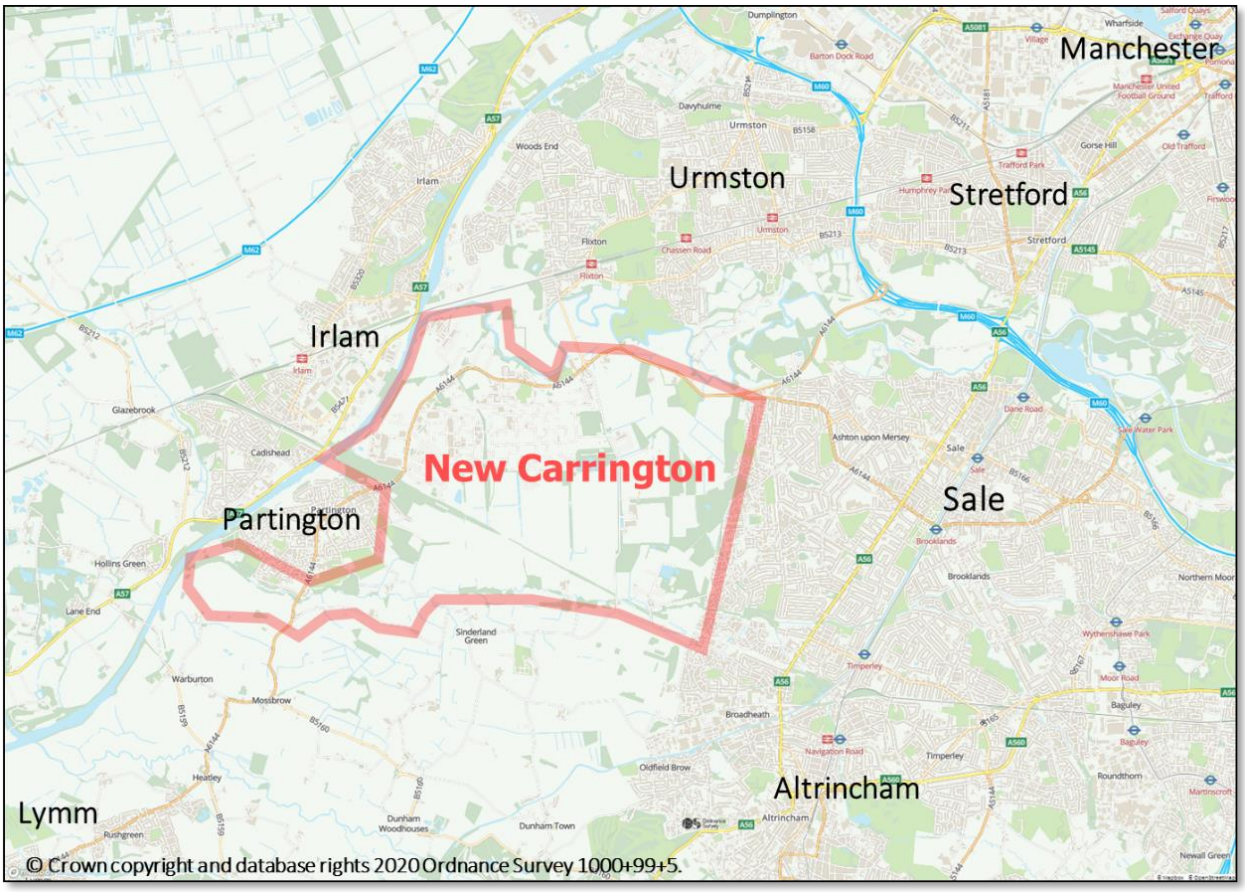


***Figure 2.1** – PfE New Carrington location (WSP)*

The proposed PfE New Carrington allocation is located in west Trafford, south of the River Mersey. The site has been identified for significant residential and employment development and is of sufficient scale to create a new community. The allocation includes a large area of brownfield land from the former Shell Carrington industrial site and other industrial areas as well as greenfield land which extends towards Sale to the east and Warburton to the south.

In the wider area, to the north of the allocation is the River Mersey and Flixton / Urmston and to the east is Sale, including the Sale West residential area. To the west is the Manchester Ship Canal which presents a barrier to movement in this direction. The existing communities of Carrington and Partington are adjacent to the proposed land development allocations. Maintaining and improving transport connections to these settlements is included in the proposed highway and active travel network; as such, the proposed highway connections provide access from the new developments to the wider highway network along with active travel proposals.

Internal walking and cycling links are proposed within the development and connections to nearby destinations (including public transport) using the proposed highway network as well as public rights of way. Bus stops and shelters are planned at 300m intervals along the proposed link roads. The estimated costs of each of these elements are included in this report.

2.2 Scoping the Infrastructure

WSP's analysis of the scheme, considering the likely development zones and their phasing, recommend that the highway links (shown in blue in Fig. 2.2 below) be constructed in a phased approach to enable adjacent land development – as shown in Figures 2.6, 2.7 and 2.8 below.

The naming convention of the link roads (defined by WSP) is Sale West, Eastern and Southern Links, as shown below. The Carrington Relief Road is shown for relative location purposes only and is excluded from this costing exercise.

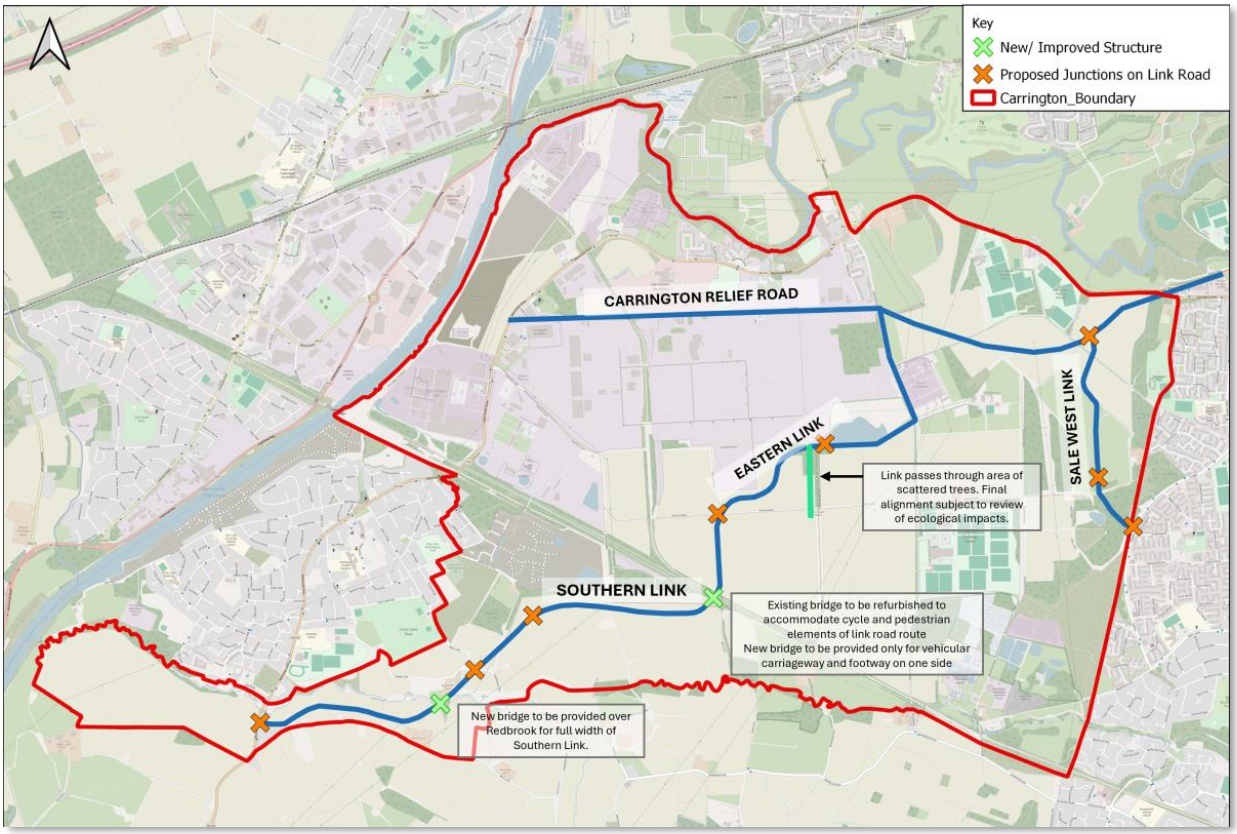


Figure 2.2 *– PfE New Carrington highway link naming convention (WSP)*

As shown in Figs. 2.3 and 2.4 below, the carriageway for each link is 6.5m wide, kerb to kerb with verges and active travel features in parallel. Street lighting is included throughout. On-carriageway bus stops and shelters are proposed to be spaced at nominally 300m intervals each side of the road.

Not shown in the cross sections is the surface water drainage system which is assumed to be a gully and pipe arrangement with outlets beyond the verges into new ponds strategically sized and spaced to accommodate runoff and limit outflow rates. As the ponds are yet to be sized and located, an assumption was made to add 5% to the costs to cover most design options. Similarly for landscaping beyond the verges, 5% has been assumed to be added to scheme costs.

While fencing is not shown in WSP's supplied information, an allowance for a 1.3m high, 4 rail wooden fence along each side of the highway corridor is included in the cost estimates. It is unlikely to be required for the full length of each corridor and may be omitted in selected locations in future stages of design and potentially be replaced with other forms of boundary treatment.

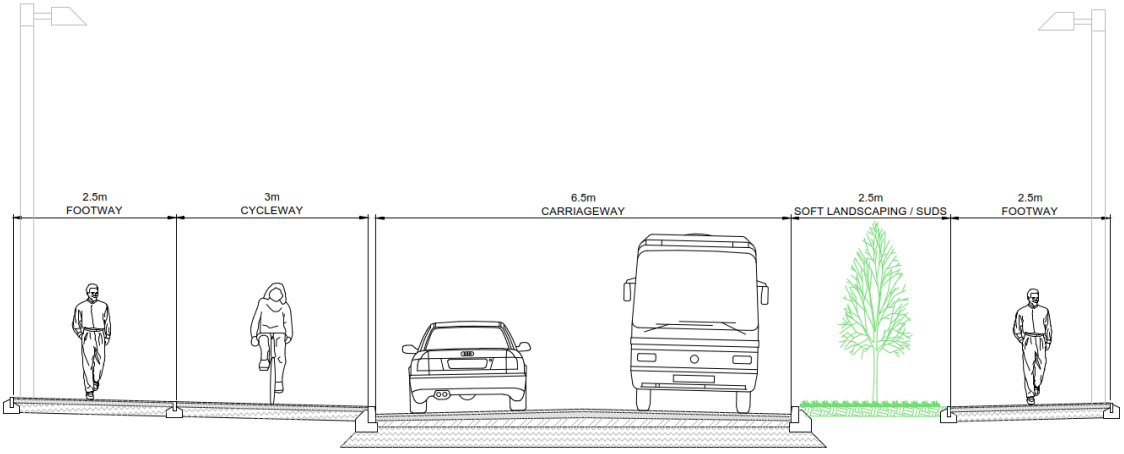


Figure 2.3 *- Typical cross section – Sale West and Southern link roads (WSP)*

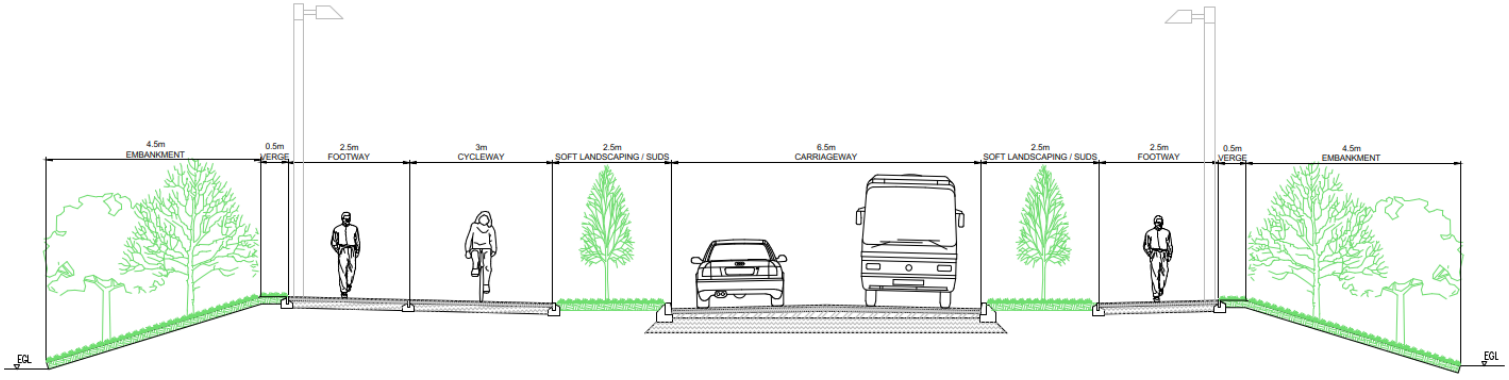
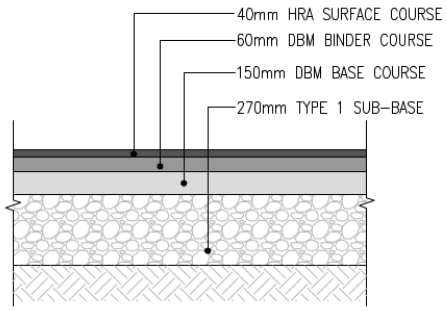


Figure 2.4 ***-*** *Typical cross section – Eastern link road (WSP)*

The proposed highway pavement comprises of HRA surface course, DBM base and binder courses and Type 1 sub-base material. The material thicknesses shown below are indicative and the final design will depend on ground conditions across the site, projected traffic volumes and design life, hence the final design may vary from the thicknesses shown in Fig. 2.5, below.



FULL DEPTH CARRIAGEWAY CONSTRUCTION

LAYER	CLAUSE	MATERIAL	BINDER	THICKNESS	SPECIAL REQUIREMENTS
SURFACE COURSE	910	HOT ROLLED ASPHALT HRA 30/14 F SURF 40/60 REC	40/60 PEN	40mm	BS EN/13108-4, 20/14 PRECOATED CHIPPINGS. PSV 50
BINDER COURSE	906	DENSE MACADAM BINDER COURSE AC20 DENSE BIN 40/60	40/60 PEN	60mm	BS 13108, PD 6691 HARDSTONE AGGREGATE. MIN PSV 50
BASE COURSE	906	DENSE MACADAM BASE AC20 DENSE BIN 40/60	40/60 PEN	150mm	BS 13108, PD 6691
SUB-BASE	803	TYPE 1 UNBOUND GRANULAR MATERIAL	N/A	270mm	BASED ON 5% CBR (CONTRACTOR TO CONFIRM ON SITE)

Figure 2.5 - *Highway pavement construction – all link roads (WSP)*

2.3 Construction Staging

A preliminary three-stage highway infrastructure phasing plan, as arranged by WSP, is shown below in Figs. 2.6, 2.7 and 2.8.

Delivery dates are currently being assessed by WSP (in consultation with TMBC) for each stage of work currently planned for completion by 2045; consequently, their costs will vary according to the delivery programme. Refer to Section 2.6 for future costs (to 2045) for each highway link, off-site work and active travel route.

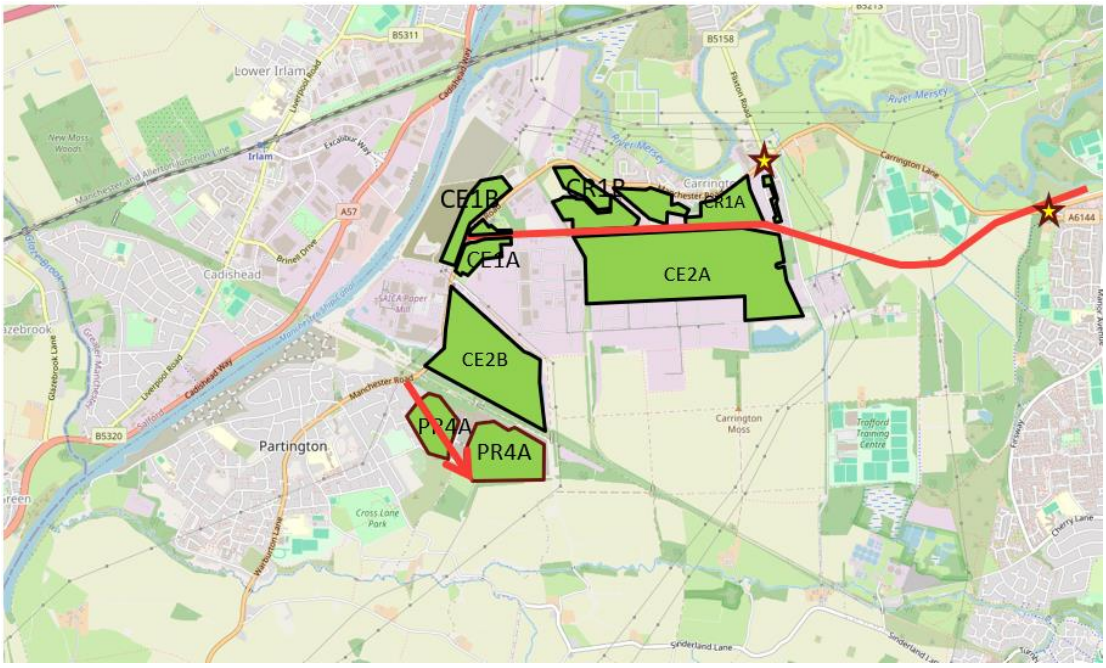


Figure 2.6 *- Phase 1 Development (green) and Highway (red) construction - (WSP)*

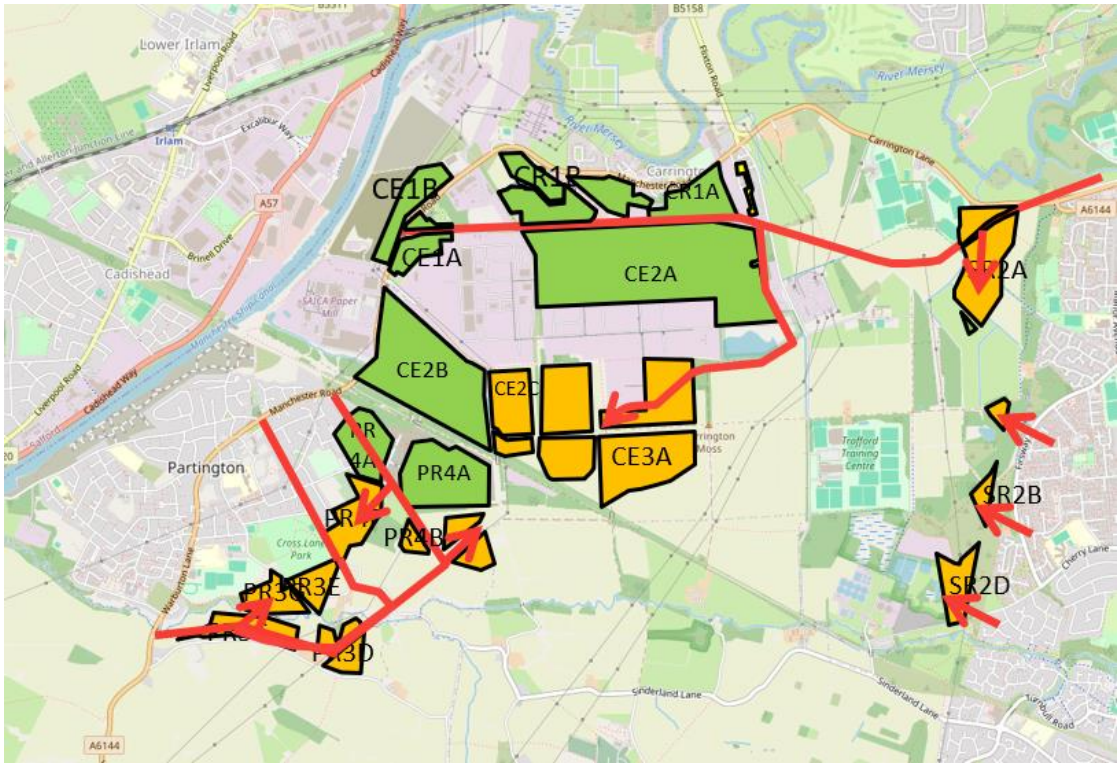


Figure 2.7 *- Phase 2 Development (orange) and Highway (red) construction - (WSP)*

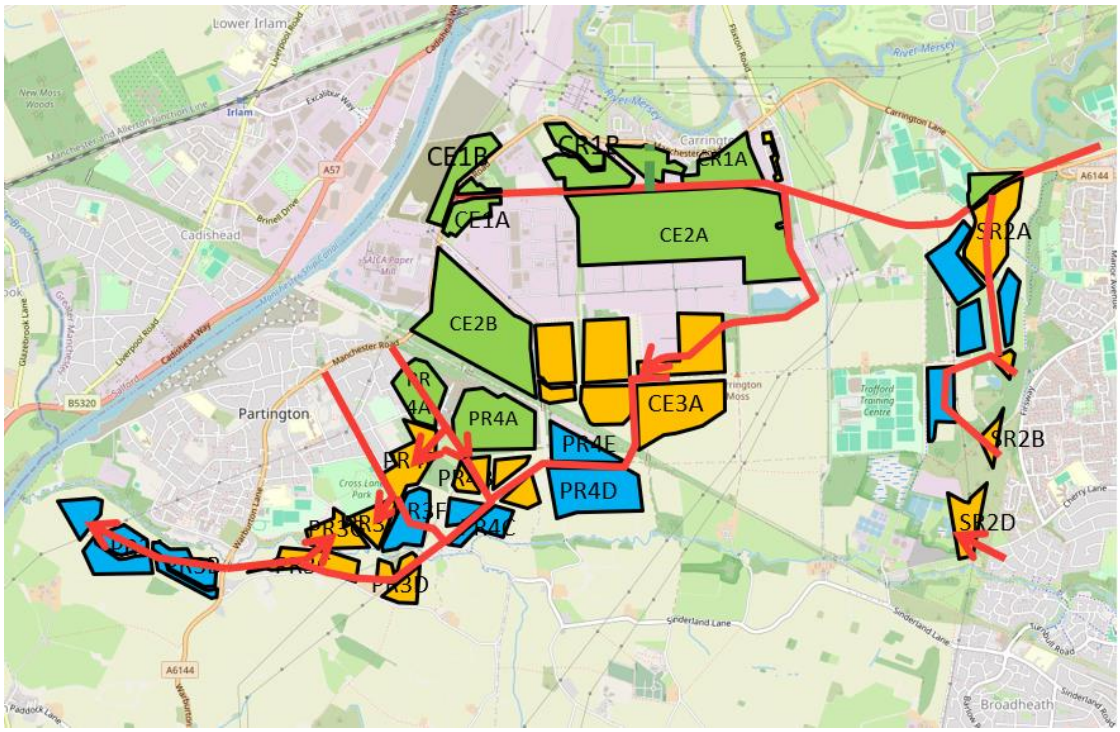


Figure 2.8 *- Phase 3 Development (blue) and Highway (red) construction - (WSP)*

WSP will further develop the staging arrangement schedule and assign costs pro-rata accordingly.

2.4 Link Road Estimated Costs

The cost estimates below present a cost breakdown for each element of the link roads. They are based on calculated 'unit' rates as described in Chapter 4.

Section Name	Section Notes	App. Length (m) / No.	Unit cost (per 100m / each)	Total
Sale West Link - 1.2km				
Highway	As per dwg. 0204-WSP-CV-SK03 (excludes junction flares)	922.000	£329,548.30	£3,038,435.37
Priority T junctions	Right turn lane & traffic islands adds £57k	1	£57,000.00	£57,000.00
Add a leg to 3-way signalised T Junction on CRR J5 (Cyclops)	At J5 on CRR - includes 228m of flare on Link Road	1	£705,070.48	£705,070.48
Roundabouts	At Firs Way 35m OD 3 arm roundabout - inc. 3 x 50m flares	1	£689,940.62	£748,520.48
Bus stops	On carriageway bus stop with shelter - a pair at 300m intervals	8	£7,549.77	£60,398.20
External drainage and landscaping improvements	E.g., ponds, drainage outlets, pond planting		Assumed additional 10%	£460,942.45
			Sub Total	**£5,070,366.98**

***Table 2.1** – Sale West Link cost components*

Eastern Link - 2.55km	Section Notes	App. Length (m) / No.	Unit cost (per 100m / each)	Total
Highway	As per dwg. 0204-WSP-CV-SK02 FSL 1m above NGL excludes junction flares	1994.000	£534,570.51	£10,659,336.04
Priority T junctions	Right turn lane & traffic islands adds £75k	2	£75,000.00	£150,000.00
Roundabouts	35m OD 3 arm roundabout - inc. 3 x 50m flares	1	£689,940.62	£748,520.48
Bus stops	On carriageway bus stop with shelter - a pair at 300m intervals	16	£7,549.77	£120,796.39
External drainage and landscaping improvements	E.g., ponds, drainage outlets, pond planting		Assumed additional 10%	£1,167,865.29
			Sub Total	**£12,846,518.20**

***Table 2.2** – Eastern Link cost components*

Southern Link - 2.85km	Section Notes	App. Length (m) / No.	Unit cost (per 100m / each)	Total
Highway	As per dwg. 0204-WSP-CV-SK03 (excludes junction flares)	2244.000	£329,548.30	£7,395,063.96
Priority T junctions	Right turn lane & traffic islands adds £57k	2	£57,000.00	£114,000.00
Large, signalised T junction (Cyclops)	At A6144 Warburton Ln. As per J1 on CRR - includes 150m flare on link road	1	£2,223,043.93	£2,411,792.94
Bus stops	On carriageway bus stop with shelter - a pair at 300m intervals	18	£7,549.77	£135,895.94
External drainage and landscaping improvements	E.g., ponds, drainage outlets, pond planting		Assumed additional 10%	£1,005,675.28
			Sub Total	**£11,062,428.12**

***Table 2.3** – Southern Link cost components*

2.5 Off-site Highway Improvements

WSP's PfE New Carrington Masterplan (July 2024) identifies multiple junctions external to the development site that require upgrading, as shown in Fig. 2.9 below. (informed by the PfE New Carrington Locality Assessment 2020 and 2021)

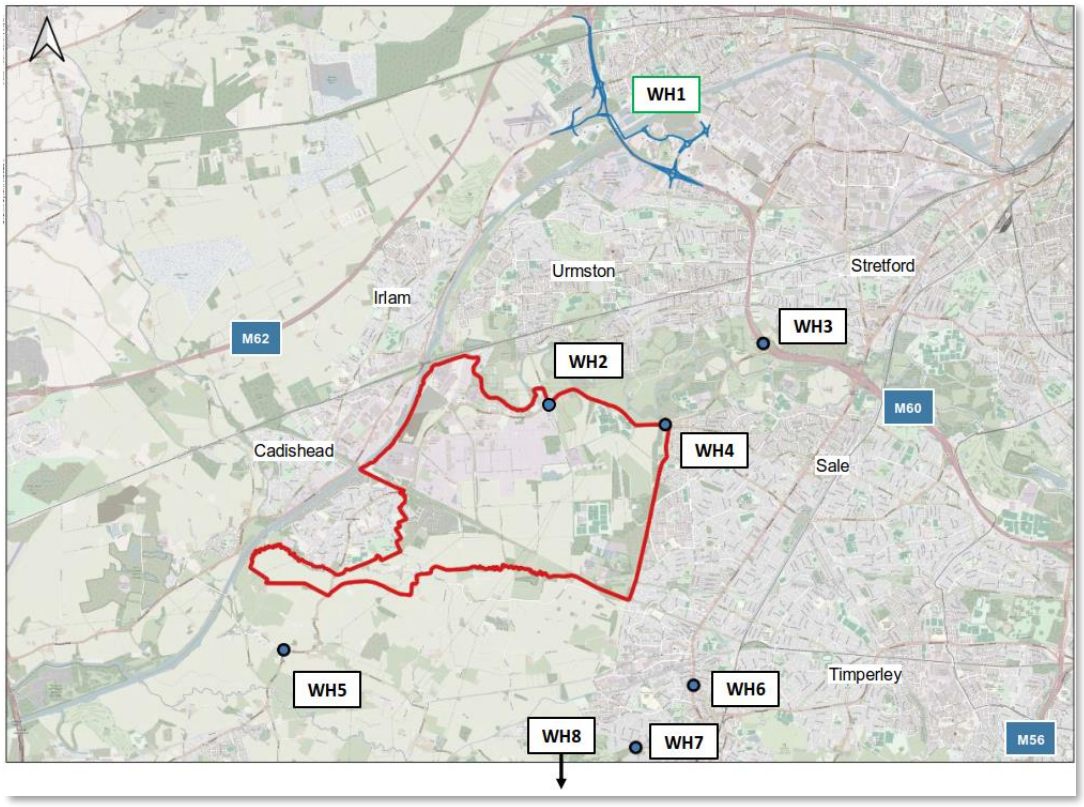


***Figure 2.9** – Future highway development proposals external to the development site (WSP)*

Note that the following schemes are excluded from this cost assessment due to being part of other external schemes.

WH1 - Western Gateway Infrastructure scheme is a requirement of the Trafford Waters development,

WH2 - Flixton Rd signalised junction upgrade is contained within the CRR scheme,

WH4 - Carrington Link/ Spur Banky Ln junction is also contained within the CRR scheme,

WH6 - A56 junction – Manchester Rd/ Barrington Rd is a part of a separate TMBC active travel scheme.

Costs for each of the sites listed in Table 2.4, below, were derived using the 'cost build up' method through Amey TI's highway works cost calculation spreadsheet. Marked-up images of each junction as supplied by WSP are shown below for reference in Figs. 2.10 to 2.13.

Off-site Highway Improvement Estimates

Location	Notes	Estimate
WH3 - Carrington Spur widening EB to M60 J8	Additional east bound lane to M60 J8	£1,010,931.08
WH5 - Heatley/ Paddock Lane/ Bent Lane	Road widening and introduce a right turn lane	£65,092.79
WH7 - Altrincham - A56 Dunham Road/ Highgate Road	Minor junction widening for new right turn lane	£9,649.61
WH8 - M56 Bowden Roundabout widening	Minor roundabout widening and road marking alterations	£33,647.48
	Total	**£1,119,320.95**

***Table 2.4** – Off-site Highway improvement estimates*

Figure 2.10 - *WH3 - Carrington Spur widening eastbound to M60 J8*

Figure 2.11 - *WH5 - Heatley/ Paddock Lane/ Bent Lane junction widening*

Figure 2.12 - *WH7 - Altrincham - A56 Dunham Road / Highgate Road junction widening*

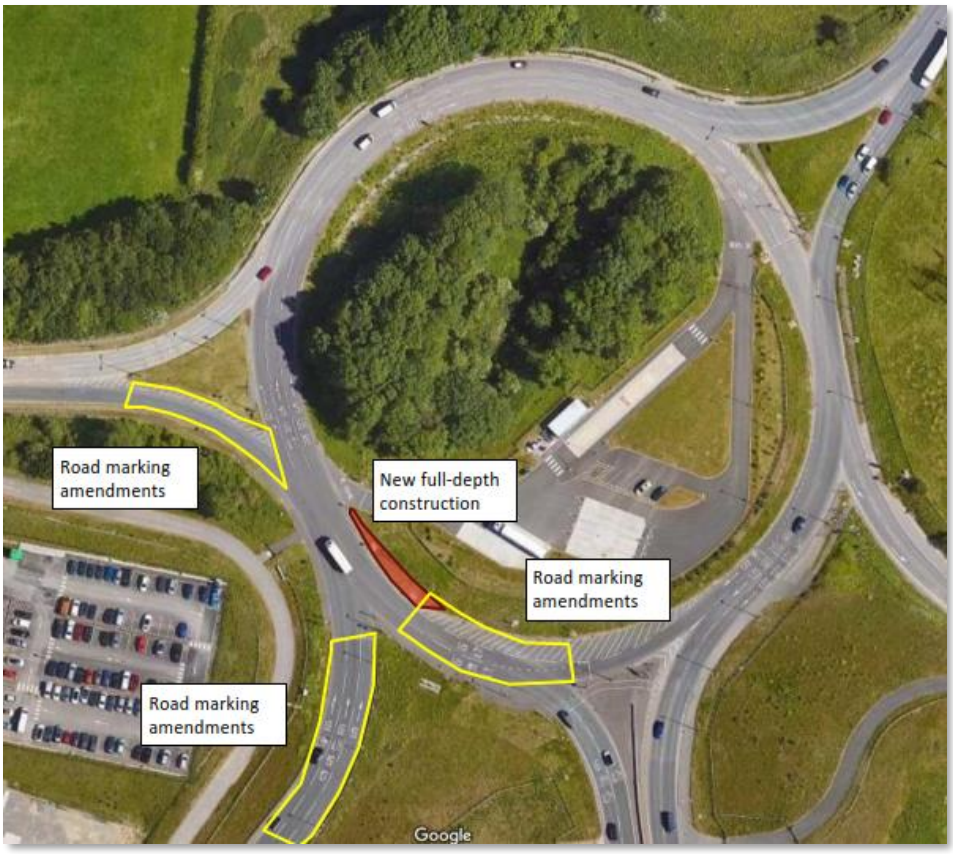


Figure 2.13 - *WH8 - M56 Bowden roundabout, carriageway widening*

2.6 Future Construction Cost Forecasts

The Office for Budget Responsibility (OBR) forecasts Retail Price Index (RPI) to fall to 2.1% in 2025 and rise to 3% in 2027 to 2030. Data forecasts from reputable sources beyond 2030 are not available; therefore, the forecasts below assume a constant annual 3% RPI rate from 2027 to 2045. We must highlight that this is an assumption. The risk register includes an entry for higher-than-expected inflation.

Section	2024 (Q2)	2030	2035	2040	2045
Sale West Link Road	£7,301,328.45	£8,600,038.43	£9,969,801.59	£11,557,732.51	£13,398,579.65
Eastern Link Road	£21,022,386.21	£24,761,703.38	£28,705,600.76	£33,277,658.75	£38,577,927.04
Southern Link Road	£19,897,896.49	£23,437,197.17	£27,170,135.05	£31,497,633.16	£36,514,389.53
Off-site works	£1,611,822.17	£1,898,521.99	£2,200,907.33	£2,551,454.80	£2,957,835.40
Existing footpath improvements	£2,782,021.47	£3,276,868.27	£3,798,788.43	£4,403,836.94	£5,105,253.99
Existing rides Improvements	£2,818,981.98	£3,320,403.06	£3,849,257.19	£4,462,344.06	£5,173,079.78
Active Travel links	£18,777,356.67	£22,117,343.44	£25,640,062.85	£29,723,860.12	£34,458,100.43
Totals	**£74,211,793.44**	**£87,412,075.74**	**£101,334,553.19**	**£117,474,520.34**	**£136,185,165.82**

***Table 2.5** – Highway Link roads cost forecasts to 2045 - (Note - costs include optimism bias rates of 44% for highways and 24% for bridges)*

3. Future Active Travel Network

3.1 Scoping the Infrastructure

The proposed PfE New Carrington allocation includes improvements of Rides, existing footways or restricted byways, unofficial walking routes and proposed strategic active travel links. It also includes two proposed toucan crossings and two new parallel zebra crossings. Locations of the proposed crossings are:

- Toucan crossing of AT6 with Warburton Ln (A6144)
- Toucan crossing of AT3 with proposed Southern link (assumed)
- New parallel zebra crossing as a link from AT5 to Firs Way
- New parallel zebra crossing at junction Sinderland Ln/ Sinderland Rd/ Dairyhouse Ln junction to link AT5 to this junction

The naming convention of the active travel routes (as defined by WSP) are:

- Equestrian 'Rides within PfE New Carrington' are shown with letters A to F. Route E is not part of the allocation. The name Rides within PfE New Carrington refers to existing bridleways proposed for upgrading and improvements as part of AT proposals. (Note - The Carrington Rides are a network of late 19th/early 20th century tram lines. Their routes are preserved within the landscape.)
- Existing footpaths or restricted byways are indicated as EX1 to EX8. EX4 is excluded as it is part of the Carrington Relief Road (CRR) scheme.
- Strategic active travel links shown as AT1 to AT7. AT1 and AT7 are excluded as they are a part of the CRR scheme.
- Figure 3.1 shows active travel links including proposed pedestrian/ cyclist crossings and indicative locations of existing unofficial walking routes (purple) to be improved. Figure 3.2 shows active travel links combined with proposed link roads.

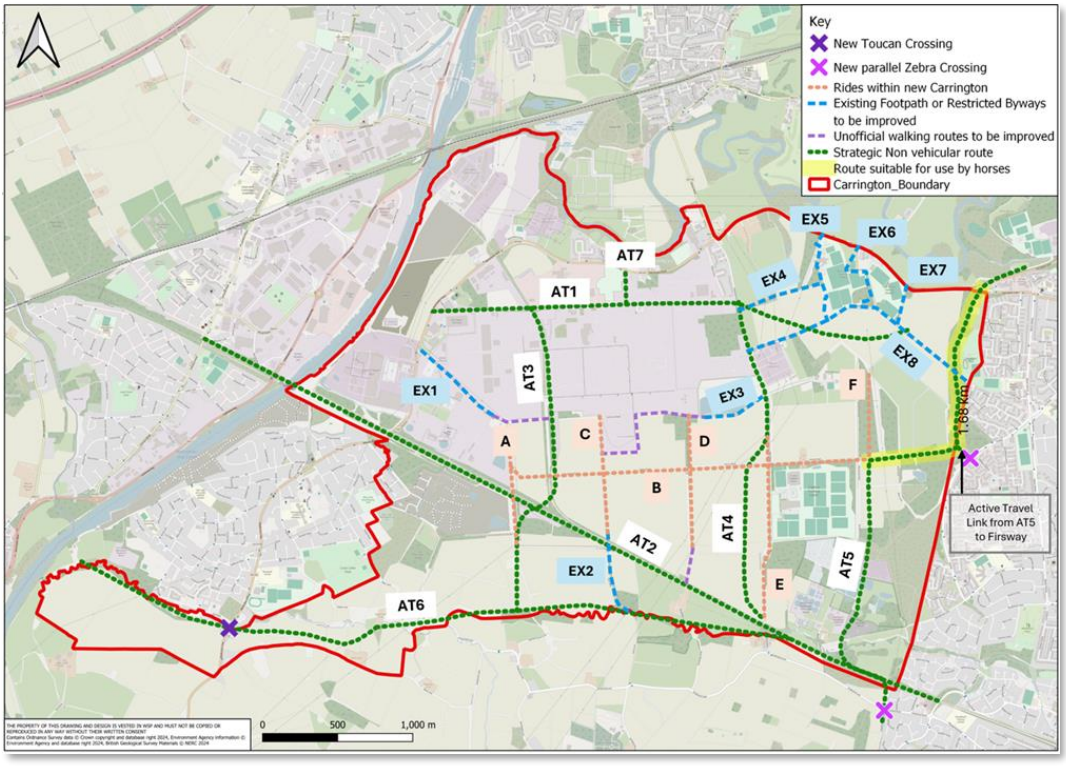


Figure 3.1 - Active travel links plan

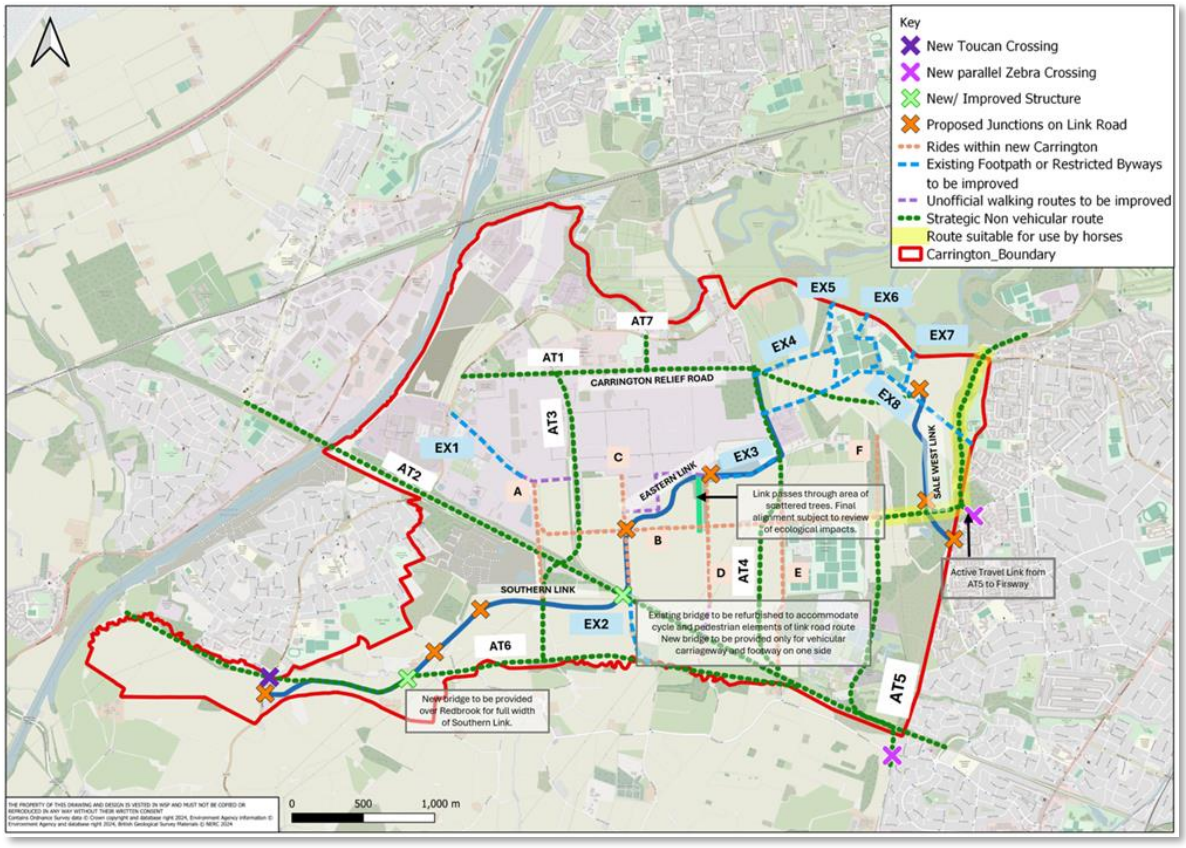


Figure 3.2 - Active travel links and link roads

3.2 Active Travel Details and Notes

The details shown in Table 3.1 and Figures 3.3, 3.4 and 3.5 and the notes below have been provided by WSP for the purposes of costing. These details are to be read in conjunction with Figures 3.1 and 3.2. Those routes indicated as existing footways or restricted byways are existing AT links proposed for improvement. The routes identified as 'Rides within PfE New Carrington' are also existing bridleways to be upgraded and improved as part of the proposals.

Equestrian Rides within PfE New Carrington	**Length**
A	0.80 km
B	2.40 km
C (excluding overlap with Eastern Link)	0.38 km
D (including extension to connect to AT2)	1.10 km
E	N/A
F (omitting overlap with AT5)	0.50 km
Existing Footway or Restricted Byway	**Length**
EX1 (includes length of unofficial walking route connecting to AT3)	1.01 km
EX2	0.55 km
EX3 (excluding length of overlap with Eastern Link but including length of unofficial	0.82 km

walking route at west end of path – potential for overlap with Eastern Link in this section too but cannot rely on this as final route is subject to further work)	
EX4 (not required: improved as part of CRR scheme)	N/A
EX5 (excluding 250m section improved as part of CRR scheme)	0.37 km
EX6	0.58 km
EX7	0.27 km
EX8	1.60 km
Strategic Active Travel links	**Length**
AT1 - fully provided as part of CRR scheme	N/A
AT2 - wooded areas, vegetation clearance, moderate earthworks to make good	5.60 km
AT3 - wooded areas, vegetation clearance, moderate earthworks to make good	2.50 km
AT4 - From Birch Road: vegetation clearance, through green fields	1.05 km
AT5 - (shared way construction) Through Trafford millennium woodland, vegetation clearance, includes link to Firs Way	2.37 km
AT5 - (bridleway construction) Through Trafford millennium woodland, vegetation clearance	1.68 km
AT6 - (excluding section that overlaps with Southern Link) Alongside Red Brook, wooded areas, vegetation clearance, earthworks required	4.15 km
AT7 – already has hardstanding and lighting	N/A

Table 3.1 - Details of costed active travel links

Notes for Costing

1. With the exception of AT2 and AT5, strategic active travel links are to be provided in line with the details shown in Figs. 3.3, 3.4 and 3.5 below.
2. AT2 is to be costed in line with point 1 above, but for a width of 4m rather than the 3m width shown on the typical section.
3. AT5 is to be costed in line with point 1 above for 2.37km. The remaining 1.68km section that will be used by horses is costed in line with the details shown in Fig, 3.5 of this report (full depth bridleway construction).
4. Rides within PfE New Carrington and existing footpaths or restricted byways (as described in Section 3.1) are costed in line with the details shown in Fig. 3.5 with the exception of street lighting.
5. Length of AT4 listed above is only from Carrington Greenway (AT2) to its tie-in with EX3.
6. Ride F as existing terminates at the Carrington Riding College. It acts as a horse-friendly route from there to the Carrington rides.
7. The existing Dunham Rd bridge over AT2 is assumed to be sound for the purposes of active travel (subject to inspection).

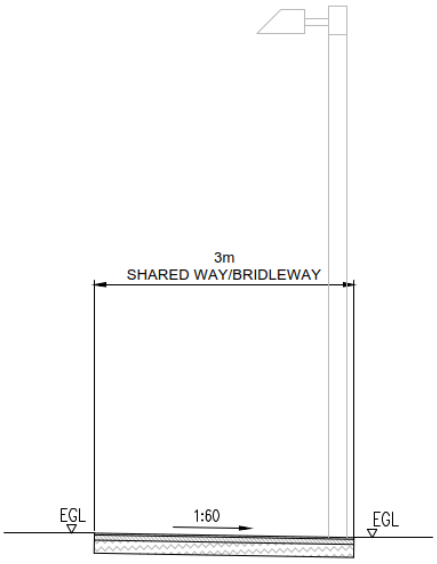
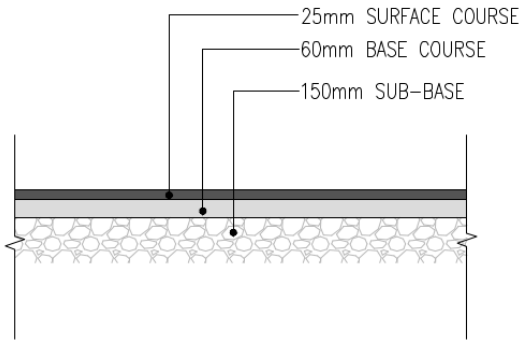


Figure 3.3 - Active travel pavement typical cross section with provision of street lighting (WSP)

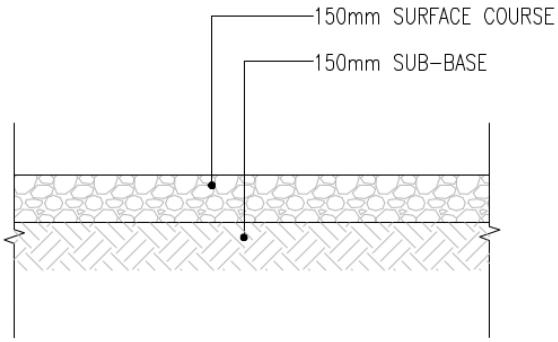


FULL DEPTH SHARED WAY CONSTRUCTION

SCALE – 1:20

LAYER	CLAUSE	MATERIAL	BINDER	THICKNESS	SPECIAL REQUIREMENTS
SURFACE COURSE	910	HOT ROLLED ASPHALT HRA 30/14 F SURF 40/60 REC	40/60 PEN	25mm	BS EN/13108-4
BASE COURSE	906	DENSE MACADAM BASE AC20 DENSE BIN 40/60	10/60 PEN	60mm	BS 13108, PD 6691
SUB-BASE	803	TYPE 1 UNBOUND GRANULAR MATERIAL	N/A	150mm	

Figure 3.4 – Full depth shared way construction (WSP)



FULL DEPTH BRIDLEWAY CONSTRUCTION

SCALE – 1:20

LAYER	CLAUSE	MATERIAL	BINDER	THICKNESS	SPECIAL REQUIREMENTS
SURFACE COURSE	806, 618	AGGREGATE WITH 25% TOPSOIL	–	150mm	–
SUB-BASE	805	DOT TYPE 3 GRANULAR MATERIAL	–	150mm	–

Figure 3.5 – Full depth bridleway construction (WSP)

3.3 Typical Cross Sections and Pavement Construction

Typical Cross Sections

The 3m wide footway/ cycleway (as shown in Figure 3.3) is in accordance with DMRB CD 143 - *Designing for walking, cycling and horse-riding* and is applicable to all active travel routes except AT2. AT2 has been costed for a width of 4m in line with Trafford Greenway Feasibility Assessment Report (*Document Ref. CO00201536/001 Revision 3, July 2023)*, as agreed with WSP.

Figure 3.4 is applicable to the strategic non-vehicular AT route (AT2 – AT6) with provision of street lighting, as shown in Figure 3.3. Rides within PfE New Carrington (AT routes A - D) and existing footpaths or restricted byways (AT routes EX1 – EX8) have been costed without street lighting, as advised by WSP.

Pavement Construction and Materials

The proposed strategic active travel routes AT2 – AT6 pavement comprises of Hot Rolled Asphalt (HRA) surface course, Dense Bitumen Macadam (DBM) base course and Type 1 sub-base material as shown in figure 3.4. For rides Within PfE New Carrington and existing footpath or restricted byways, the proposed improvements comprise of a mixture of topsoil and type 3 sub-base material as shown in Figure 3.5. The material thicknesses shown are indicative only and final design will depend on ground conditions across the site; hence, their thicknesses may vary from those shown in the figures above.

3.4 Assumptions

For the purposes of costing, the following assumptions have been made.

- 1.5m wide verges are assumed on each side of the AT routes in addition to the 3m (4m - AT2) wide shared way. Site clearance and excavation were calculated based on this assumption.

- No kerbs, channels or edgings are proposed along the AT routes as per the typical cross sections provided by WSP.
- Fencing: It is difficult to be specific on the requirements of fencing at this stage as in some areas active travel routes may run through or between development plots. For costing purposes however, it is assumed that those strategic AT routes running through wooded areas may require fencing on both sides and costs for this have been allowed for.
- Tree removal for those active travel routes passing through wooded areas has been assumed but exact numbers are to be confirmed at later stage.

3.5 Construction Phasing

The phasing shown in Figures 3.6 and 3.7 is an indication of how the link roads and active travel routes will be built up in conjunction with the phased delivery of adjacent development. Delivery dates are currently being assessed by WSP (in consultation with TMBC) for each stage of work and planned for completion by 2045; consequently, their costs will vary according to the delivery programme. Refer to Section 2.6 for future costs (to 2045) for each active travel route.

Interim Phase

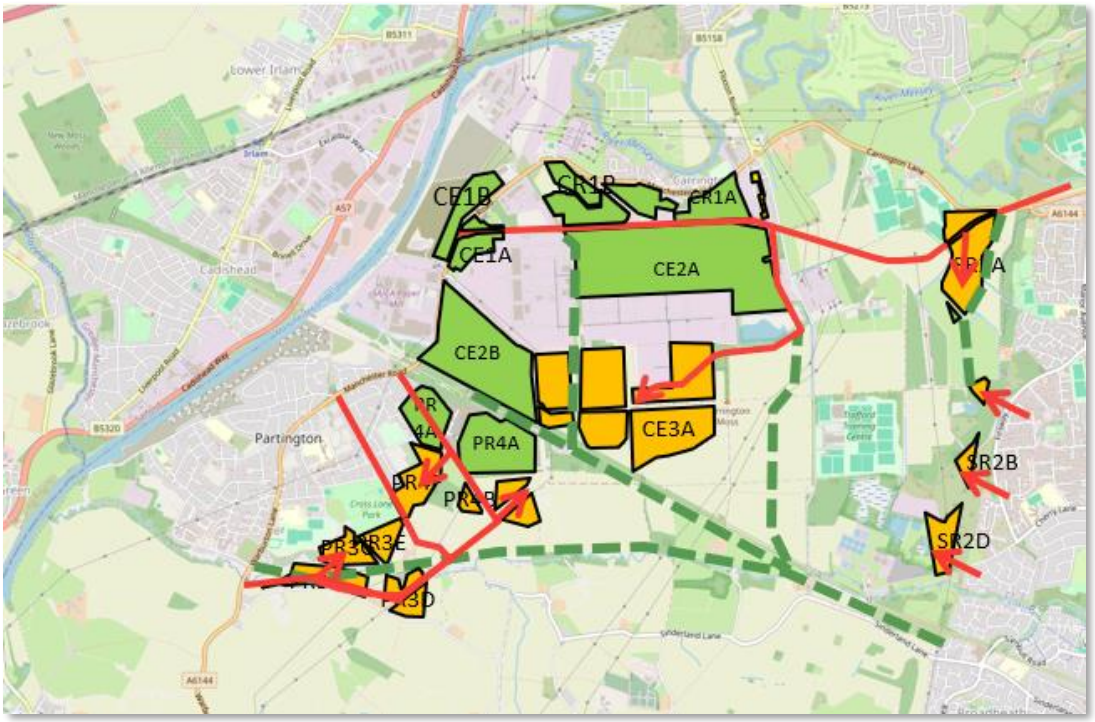


Figure 3.6 – Interim active travel phase (WSP)

Final Phase

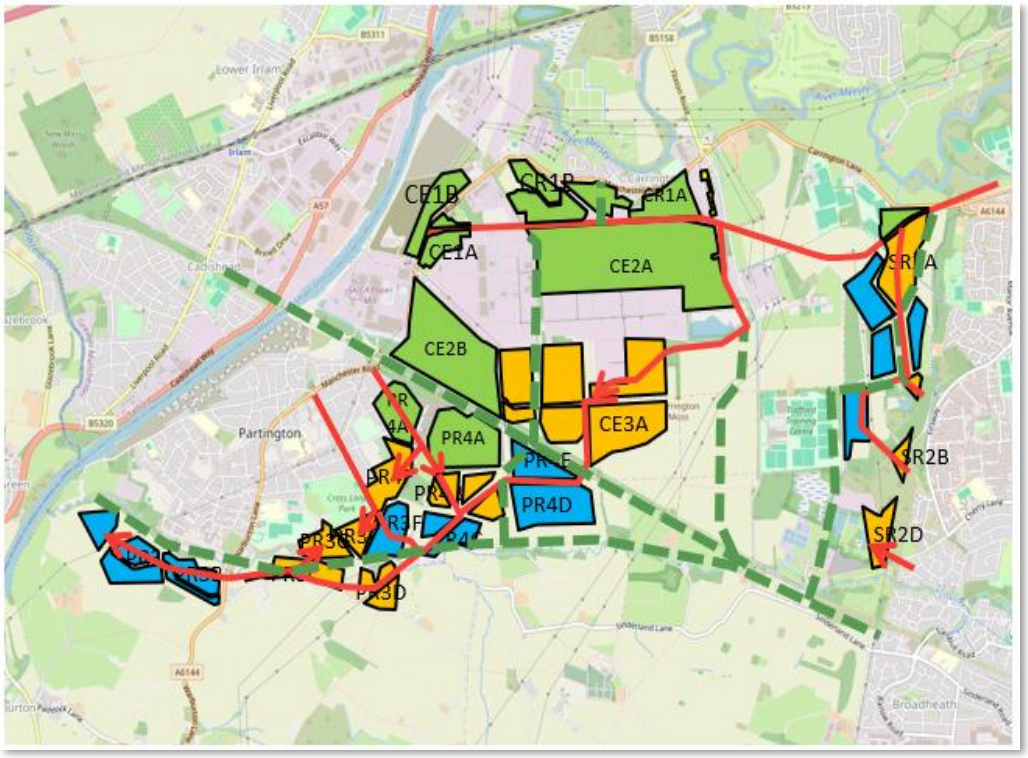


Figure 3.7 – Final active travel phase (WSP)

4. Highway and Active Travel Works Pricing Methodology

4.1 Pricing Methodology

Amey agreed a pricing methodology for the NCIC with TMBC in August 2024 whereby a typical highway and active travel section is costed per linear metre and then applied to the total corridor lengths with factors of optimism bias, risk etc. applied thereafter.

Amey opted to calculate costs per 100m length of highway and active travel which were then used as the baseline cost for the various lengths of the proposed link roads and active travel corridors. WSP's masterplan information identified the corridor lengths for each which are shown in tables 2.1 to 2.3.

4.2 Identifying and Pricing Risk

The PfE New Carrington scheme covers an extensive area and there are known challenges and constraints on parts of the site which need to be considered, such as land contamination. There are also expected risks around land ownership, planning conditions and programme slippage. Upon this, the likely project risks were identified and costed to reflect the large scale of the PfE New Carrington development.

The categories included in the risk assessment include geotechnical, structural, environmental, design, planning/ approvals, statutory undertakers/ private utilities, land assembly and programme.

At the early stages of the development risk is normally at its highest due to the extensive list of variables and unknowns influencing cost. These risks are expected to reduce as the scheme progresses and should be recalculated accordingly at regular intervals as a 'live document' throughout the PfE New Carrington development phases.

Appendix A contains the quantitative risk register.

4.3 Optimism Bias

Optimism bias has been included in the costs shown in Table 1.1 with low, medium and high rates, i.e. 3%, 24%, 44% for highway and active travel work and 2%, 13% and 24% for the bridge structures, as recommended in 'The Green Book' (HM Treasury, p.2).

As with 'risk', the rates of optimism bias applicable to a project reduce as it progresses toward completion due to unknowns becoming known and risks either being realised or eliminated. Upon this, the rates used for determining optimism bias can also be progressively reduced.

Amey recommend using the highest rates at this stage of the project.

Table 4.1 below shows HM Treasury's recommended rates for optimism bias, as used in this costing exercise.

Project Type	Optimism Bias (%)[2]			
	Works Duration		Capital Expenditure	
	Upper	Lower	Upper	Lower
Standard Buildings	4	1	24	2
Non-standard Buildings	39	2	51	4
Standard Civil Engineering	20	1	44	3
Non-standard Civil Engineering	25	3	66	6
Equipment/Development	54	10	200	10
Outsourcing	N/A	N/A	41*	0*

Table 4.1 *– HM Treasury recommended Optimism Bias rates (p2. The Green Book)*

Appendices

Appendix A - NCIC Quantitative Risk Register

NEW CARRINGTON INFRASTRUCTURE COSTING - QUANTITATIVE RISK REGISTER

Last Updated 27/11/2024

No.	Category	Risk Event	Cause	Consequence	Impact	Likelihood	Risk Impact	Mitigation	Impact	Likelihood	Risk Impact	Assumption	Qty	Rate	Total	Likelihood	Most Likely	Sub Total
1	**Geotechnical / Structural**																	**£329,966.50**
1.1		Contaminated Ground (PFAS/PFOS)	Historical activity	Additional cost / Programme prolongation. Possible design changes to avoid / contain.	4	5	20	Identify extents of PFAS / PFOS contamination. Further research into requirements for dealing with PFAS / PFOS. Engage specialists. Design changes to avoid.	3	5	15	500 m3.	500	£155.25	£77,625.00	£77,625.00	£38,812.50	
1.2		Discovery of Peat	Lense of peat identified at south end of site	Settlement of construction above. Environmental impact.	4	3	12	Identify extents of Peat. Design to avoid. Ground improvement.	4	2	8	100m3	100	£29.33	£2,933.00	£2,933.00	£1,466.50	
1.3		Unknown Ground Conditions	Lack of GI information	Increased foundation works. Trained personnel / geotechnical watching brief required during excavation works. Programme delays. Cost increases.	4	4	16	Carry out additional GI / trial pits / window samples.	3	2	6	Most expensive at bridges - larger foundations. Much geotech investigation and design required			£100,000.00	£100,000.00	£50,000.00	
1.4		Groundwater levels impacting construction activities	High water table	Flooding during construction causing programme delays.	4	5	20	Dewatering.	4	3	12	Dewatering during construction			£25,000.00	£25,000.00	£12,500.00	
1.5		Unknown contamination such as buried animal remains etc	Farming activities	Additional disposal required. Possible licencing.	5	3	15	Additional GI to identify any pockets of contamination within scheme footprint.	5	2	10	100m3	100	£155.25	£15,525.00	£15,525.00	£7,762.50	
1.6		Existing infrastructure / assets in poor condition	Interface with existing structures / highway on A6144	Additional works required to strengthen / replace.	4	3	12	Condition surveys undertaken of existing structures in advance of construction.	4	2	8	Rebuild of highway pavements possibly needed			£250,000.00	£250,000.00	£125,000.00	
1.9		Discovery of Coal Tar	Removal of existing surfacing	Increased disposal costs.	3	4	12	Core samples to identify possible contamination. Re-design to avoid the need for removal.	3	3	9	Disposal required.	100	£155.25	£15,525.00	£15,525.00	£7,762.50	
1.10		Delay due to archaeological discovery / item of value.	Discovery of archaeological items / items of value.	Programme delays.	4	2	8	Additional GI.	4	1	4	Programme impact 1 month			£50,000.00	£50,000.00	£25,000.00	
1.11		Site won topsoil not suitable for re-use within scheme	Existing topsoil is too nutrient rich for reuse in greenfield site	Increased disposal costs and replacement importation costs.	4	3	12	Undertake testing on existing topsoil to confirm suitability. Specification criteria altered to ensure acceptance.	4	2	8	Low probability - allow 5000 m3	5000	£29.33	£146,650.00	£146,650.00	£36,662.50	
1.12		Asbestos discovered during construction	Asbestos waste from existing building demolition still on site.	Increased disposal costs.	3	3	9	Additional GI to identify any pockets of contamination within scheme footprint.	3	2	6	100m3 - Unlikely	100	£250.00	£25,000.00	£25,000.00	£6,250.00	
1.13		Industrial waste discovered during construction	Waste generated from industrial usage of site	Increased disposal costs.	3	4	12	Additional GI to identify any pockets of contamination within scheme footprint.	3	3	9	100m3 - possible	100	£250.00	£25,000.00	£25,000.00	£12,500.00	
1.14		Contamination within existing drainage network etc makes it way into watercourses	Encountered during construction works either through putting water through system or water entering excavations	Pollution of watercourses Prosecution.	5	3	15	Additional GI to identify location of existing drainage network.	5	2	10	Drainage diversion into ponds			£25,000.00	£25,000.00	£6,250.00	
2	**Environmental**																	**£366,567.72**
2.1		Liaison with other bodies such as Natural England / EA leads to delay / additional requirements	Poor communications, staff changes, NE / EA changing regs.	Delay to commencement	3	3	9	Work closely with Amey to manage process. Regular programme update and action plans as required	3	2	6	RPI rate at 2.7% pa - nom 3 month delay	65,731,033.66	0.67%	£440,397.93	£440,397.93	£88,079.59	
2.2		Additional unforeseen assessments / 3rd party interface	Interface with other parties, non statutory concerns / preferences	Delay to commencement, additional cost	3	3	9	Review of any likely additional impact with subject matter experts	3	2	6	RPI rate at 2.7% pa - nom 3 month delay	65,731,033.66	0.67%	£440,397.93	£440,397.93	£88,079.59	
2.3		Prolonged EIA process or unforeseen consultees	Consultees come back with additional constraints. National Highways / FOCM.	Delay to commencement, additional cost	4	3	12	Early liaison and attempting to get on board with scheme.	3	3	9	RPI rate at 2.7% pa - nom 3 month delay	65,731,033.66	0.67%	£440,397.93	£440,397.93	£88,079.59	
2.4		Temporary measures for existing ecology scope increase	Bats, ground nesting birds, otters etc	Additional costs Programme delays	4	3	12	Understand extent of ecological measures and programme works accordingly	4	2	8				£20,000.00	£20,000.00	£4,000.00	
2.5		BNG management post maintenance period	Establishment of items such as aquatic planting beyond 12 month maintenance period	Costs for management not accounted for	5	2	10	Agree responsibility for BNG management and price accordingly.	5	1	5				£10,000.00	£10,000.00	£5,000.00	
2.6		Environmental protestors	FOCM & other opposing groups	Public perception of scheme Programme delays through planning delays,	3	5	15	Engage with protestor groups early to try and get on side.	2	3	6	RPI rate at 2.7% pa - nom 1 month delay	65,731,033.66	0.23%	£147,894.83	£147,894.83	£29,578.97	
2.7		Temporary discharge licence for putting water through newly installed drainage	Using new drainage infrastructure to drain site	Licence not granted and no way to manage construction surface water	5	4	20	Understand licencing process and apply early in programme.	5	2	10	Early mitigation will reduce risk			£2,000.00	£2,000.00	£1,000.00	
2.8		PFAS / PFOS additional constraints	Existing contamination on site	Additional costs	3	5	15	Engage with subject matter experts and understand requirements for working with and disposing of contamination.	2	5	10	Nominal cost proposed			£25,000.00	£25,000.00	£12,500.00	
2.9		Environmental health	Excavation within contaminated site	Public perception of scheme	3	3	9	Engage with residents and protestor groups early to try and get on side.	2	2	4	Nominal cost proposed			£1,500.00	£1,500.00	£750.00	
2.10		Surface water run off	Management of surface water run off / contaminated ground	Risk of contamination of surrounding areas / watercourses	5	3	15	Additional GI to identify extent of contamination. Ensure appropriate measures put in place to manage and catch contamination.	5	1	5	Nominal cost proposed			£10,000.00	£10,000.00	£2,000.00	
2.11		COMAH regulation compliance	Existing COMAH site	Additional costs Programme delays Non compliance with regulations	3	5	15	Understand regulations surrounding work in COMAH site and price accordingly.	2	5	10	Nominal cost proposed			£5,000.00	£5,000.00	£2,500.00	
2.12		Granting of environmental licencing	Presence of Water voles etc	Programme delays	4	3	12	Identify any environmental licences required and acquire in a timely manner.	3	2	6	Early mitigation will reduce risk			£5,000.00	£5,000.00	£2,500.00	

2.13		Additional ecological constraints as a result of findings of subsequent inspections	Further environmental and ecology surveys required	Additional costs Programme delays	4	3	12	Undertake additional surveys as early as possible to identify any further measures required	3	2	6	Nominal cost proposed			£10,000.00	£10,000.00	£5,000.00	
2.14		Pathways for contaminated water to enter watercourses due to new drainage design / construction activities	New drainage provides pathway for contaminated ground water to enter watercourses through pipe medium	Environmental incident Prosecution	5	4	20	Additional GI to identify extent of contamination. Install plugs to isolate contamination and avoid direct pathway to watercourses.	5	2	10	Nominal cost proposed			£10,000.00	£10,000.00	£5,000.00	
2.15		Periods of ecological / environmental constraint increase. Seasonal survey requirements / crop & harvest access limitations	Climate change causing increased temperatures which move / extend seasons.	Additional costs Programme delays	4	2	8	Carry out works in advance to de-risk construction programme.	3	2	6	Low probability			£25,000.00	£25,000.00	£2,500.00	
2.16		Discovery of invasive species	Invasive species present on site	Treatment required Additional costs	3	3	9	Additional SI to identify areas of potential invasive species. Re-design to avoid where possible.	2	3	6	Nominal cost proposed			£25,000.00	£25,000.00	£5,000.00	
2.17		Land availability for BNG / ponds, drainage lines	Land acquisition may require CPO, public hearing etc.	Additional costs & programme delay	4	3	12	Early contact with land owners. Minimise BNG / Pond land requirements	2	3	6	Nominal cost proposed			£50,000.00	£50,000.00	£25,000.00	
3	**Design**																	**£1,250,000.00**
3.1		Scope creep	Changes in scope post target cost Design not adequately reviewed during Pre Construction	Additional costs Programme delays	5	3	15	Ensure design is sufficiently reviewed including buildability during Pre Construction phase	3	2	6	Nominal cost proposed			£1,000,000.00	£1,000,000.00	£200,000.00	
3.2		Design change due to new information, e.g. on private land, land drains, GI.	Revised GI etc	Additional costs	4	2	8	Carry out any additional testing / investigation required to inform design ahead of detailed design phase.	3	2	6	Nominal cost proposed			£100,000.00	£100,000.00	£50,000.00	
3.3		Traffic modelling impact on design	External traffic modelling review and comment from TfGM etc	Altered design as a result of traffic modelling changes	5	3	15	Obtain TfGM comments early in design stage.	4	2	8	Early assessment will reduce risk			£5,000,000.00	£5,000,000.00	£1,000,000.00	
4	**Planning / Approvals**																	**£1,978,098.18**
4.1		Delay in obtaining Planning Consent	Objections, call in by Secretary of State, for example	Delay to commencement	5	3	15	Review conditions at Planning Consent and action accordingly. Seek advance sight of conditions prior to Consent	5	2	10	RPI rate at 2.6% pa - nom 3 month delay	65,731,033.66	0.67%	£440,397.93	£440,397.93	£88,079.59	
4.2		Onerous Discharge Conditions within Planning Consents	Requirement of Planning Consent	Delay to commencement	4	3	12	Action plan to discharge consents on receipt of Planning Consent. Early sight of conditions if possible	4	2	8	Nominal cost proposed			£500,000.00	£500,000.00	£100,000.00	
4.3		Delay in Discharge of Planning Conditions	Onerous consents / 3rd party interface, for example	Delay to commencement	3	3	9	Review conditions at Planning Consent and action accordingly. Seek advance sight of conditions prior to Consent	3	2	6	Nominal cost proposed			£10,000.00	£10,000.00	£5,000.00	
4.4		Public Inquiry	Not accounted for in programme currently	Delay to commencement	5	4	20	Further guidance from TMBC.	4	4	16	1 year delay, inflation, minimal pre construction support RPI rate at 2.6% pa - 12 month delay	65,731,033.66	2.70%	£1,774,737.91	£1,774,737.91	£443,684.48	
4.5		CPO Process (currently includes inquiry)	Protracted process due to pushback from landowners	Delay to commencement Inability to carry out any rationalisation works.	5	4	20	Early communication with landowners regarding proposed solution and land access requirements.	5	3	15	RPI rate at 2.6% pa - nom 18 month delay	65,731,033.66	3.90%	£2,563,510.31	£2,563,510.31	£1,281,755.16	
4.6		Public / 3rd party consultation & engagement	Current 3rd party consultation not sufficient due to Covid 19 pandemic.	Delay in planning	4	3	12	Seek definitive answer on whether 3rd party consultation undertaken was sufficient.	3	2	6	Nominal cost proposed			£50,000.00	£50,000.00	£10,000.00	
4.7		Delays in obtaining permits	EA permits not granted for River Mersey outfalls etc	Delay to commencement	4	2	8	Early engagement with EA regarding likely licence requirements.	3	2	6	RPI rate at 2.6% pa - nom 1 month delay	65,731,033.66	0.23%	£147,894.83	£147,894.83	£29,578.97	
4.8		Working on Peel land	Access not granted by Peel	Programme delays Change in design	4	3	12	Early communication with Peel regarding proposed solution and land access requirements.	4	2	8	Nominal cost proposed			£50,000.00	£50,000.00	£10,000.00	
4.9		TfGM involvement with construction TM sequencing / TM proposals resulting in changes to construction methodology.	TfGM review of TM sequencing	Additional costs Programme delays	4	3	12	Obtain TfGM comments on TM sequencing during Pre Construction.	4	2	8	Nominal cost proposed			£50,000.00	£50,000.00	£10,000.00	
5	**Statutory Authorities / Private Utilities**																	**£161,250.00**
5.1		Delays in statutory authority diversions	Lack of resources Lack of scope understanding Uncharted services	Additional costs Programme delays	4	4	16	Ensure a clear Scope is defined. Sufficient interrogation of C2 / C3 / C4 by competent person. Carry out diversions in advance of construction phase.	2	3	6	Nominal cost proposed			£100,000.00	£100,000.00	£25,000.00	
5.2		Private utilities scope creep	Lack of understanding of process Utilities not as shown on plans. 3rd party interaction.	Delay to commencement Additional costs	4	5	20	Private utilities rationalisation works carried out. Undertake trial holes to validate position of utilities. Understand owner requirements / constraints.	4	4	16	Nominal cost proposed			£50,000.00	£50,000.00	£25,000.00	
5.3		Discovery of unknown stats utilities or stats in different positions to C2 info.	Lack of information Somewhat inevitable	Additional costs Programme delays	4	3	12	Undertake trial holes to validate position of utilities.	3	3	9	Nominal cost proposed			£50,000.00	£50,000.00	£10,000.00	
5.4		Discovery of unknown private utilities	Lack of information Somewhat inevitable	Additional costs Programme delays	5	4	20	Undertake trial holes to validate position of utilities. Expansive trial hole plan.	4	3	12	Nominal cost proposed			£50,000.00	£50,000.00	£5,000.00	
5.5		Condition of existing private utilities	Utilities are aged and in known poor condition.	Pre-existing damage blamed on project. Programme delays & additional costs if repairs / replacements required.	5	4	20	Carry out pre-condition survey of known assets. Include within legal agreements.	5	4	20	Nominal cost proposed			£50,000.00	£50,000.00	£25,000.00	
5.6		Engagement of 3rd party to carry out private utility engagement	Lack of competence within immediate project team.	Additional costs	3	3	9	Utilise experience of external consultants where possible to rationalise works required.	3	2	6	Nominal cost proposed			£5,000.00	£5,000.00	£2,500.00	
5.7		Phasing of works around utility diversion delays	Utility diversions require programme logic changes.	Could result in items becoming critical that weren't previously increasing project risk.	4	3	12	Commence construction phase following utility diversions.	3	2	6	Nominal cost proposed			£10,000.00	£10,000.00	£5,000.00	

5.8		LYB lack of cooperation	LYB cooperation required to manage interface with private utilities and relationship currently not in place.	Delay to commencement	5	4	20	Continue to seek communication pathway with LYB.	5	3	15	Nominal cost proposed			£10,000.00	£10,000.00	£2,500.00	
5.9		Contamination from existing private utility infrastructure entering CRR works	Private utilities have been contaminated through historic use.	Hazardous to health. Additional contamination for project to dispose of.	4	3	12	Understand location and levels of contamination. Understand legislative requirements.	4	2	8	Nominal cost proposed			£5,000.00	£5,000.00	£1,250.00	
5.10		Interface with existing services	Utilities will remain present within works.	Additional processes required to work around safely.	3	5	15	Undertake GPR survey and trial holes to validate position of utilities.	2	5	10	Nominal cost proposed			£100,000.00	£100,000.00	£50,000.00	
5.11		Damage to business critical private utility	Lack of care during construction	Contra charge of lost time	5	4	20	Utilise vacuum excavation and BB safe excavation procedures during all excavation works.	5	1	5	Nominal cost proposed			£50,000.00	£50,000.00	£5,000.00	
5.12		Delay to diversion work due to client payment delays	high cost of diversions - clients seek alternatives	delay to diversions	3	2	6	Keep client(s) informed throughout stats diversion processes	2	2	4	Nominal cost proposed			£50,000.00	£50,000.00	£5,000.00	
5.13		Availability of Vac-Ex	Large amount of utilities across site requiring vacuum excavation.	Programme delays.	4	3	12	Ensure Vac-Ex is booked in line with programme requirements.	4	2	8	Nominal cost proposed			£5,000.00	£5,000.00	£2,500.00	
6	**Land Assembly**																		**£106,539.79**
6.1		Accommodation works	Agreement of land purchases	Additional costs	3	3	9	Understand any accommodation works early in programme.	2	3	6	Nominal cost proposed			£100,000.00	£100,000.00	£25,000.00	
6.2		Engagement with Wain Estates	Majority of land required for CRR route is owned by Wain Estates.	Protracted land treaty / CPO process. Monopoly on project land acquisition.	4	3	12	Engage early with Wain Estates regarding likely land take.	4	2	8	Nominal cost proposed			£100,000.00	£100,000.00	£25,000.00	
6.3		Delays in obtaining land	Land under multiple ownership, ownership confirmation, purchase delays, changes of ownership	Delay to commencement	4	4	16	Engage early with landowners. CPO.	4	3	12	RPI rate at 2.6% pa - nom 3 month delay	65,731,033.66	0.67%	£440,397.93	£440,397.93	£44,039.79	
6.4		Negotiations with land tenants & owners. Accommodation works required to land, e.g. new acesses, drainage	Requirement to access land during Pre Construction and Construction.	Additional accommodation works above and beyond those required for land owners.	4	4	16	Understand requirements of tenants.	4	2	8	Nominal cost proposed			£50,000.00	£50,000.00	£12,500.00	
7	**Programme**																		**£223,000.00**
7.1		Impact of weather on programmed outputs	Extreme weather causing reduced outputs (wet / hot / cold weather)	Additional cost / Programme prolongation	3	4	12	Adequate risk allowance in programme. Ensure programme considers seasonal working.	2	4	8	Nominal cost proposed			£1,000,000.00	£1,000,000.00	£100,000.00	
7.2		Sub Contractor / resource availability to meet programme requirements	Limited supply chain, concurrent projects elsewhere	Additional cost / Programme prolongation	4	3	12	Selected sub contractor for works will be suitably screened to ensure they have sufficient resources.	4	1	4	Nominal cost proposed			£100,000.00	£100,000.00	£10,000.00	
7.3		Unforeseen ground conditions leads to additional excavation / disposal requirements	Variable ground between borehole / trial hole locations	Additional cost / Programme prolongation	4	3	12	Detailed GI which is supplemented with additional investigation if results dictate	4	2	8	Nominal cost proposed			£500,000.00	£500,000.00	£50,000.00	
7.4		3rd party objection / interface leads to restriction on working hours, delivery routes for example	Public objection / action	Additional cost / Programme prolongation	4	3	12	Liaison with public. Nominated PLO. Access routes avoid residential areas as far as possible	4	2	8	Nominal cost proposed			£50,000.00	£50,000.00	£10,000.00	
7.5		Traffic management requirements more onerous than anticipated	Public objection / action / embargos / changes from review of TM arrangement	Additional cost / Programme prolongation	3	3	9	Liaison with public. Nominated PLO. Access routes avoid residential areas as far as possible	3	2	6	Nominal cost proposed			£50,000.00	£50,000.00	£10,000.00	
7.6		UXO discovery during concurrency of works	Wartime activity	Additional cost / Programme prolongation	4	3	12	Desk top search prior at Pre Con Stage. Engage with specialist if required	3	3	9	Nominal cost proposed			£10,000.00	£10,000.00	£2,000.00	
7.7		Maintaining public rights of way	Public objection / action	Additional cost / Programme prolongation	3	5	15	Allowance for managing access and maintaining demarcation in TC	2	5	10	Nominal cost proposed			£10,000.00	£10,000.00	£5,000.00	
7.8		Weather events less than 1:10 year event	Global warming	Additional cost / Programme prolongation	3	5	15	Adequate risk allowance in programme. Ensure programme considers seasonal working.	2	5	10	Nominal cost proposed			£50,000.00	£50,000.00	£10,000.00	
7.9		Resource availability	Client / Designer / Contractor	Programme dates not met.	5	3	15	Ensure progress against programme is tracked and any resource issues flagged early.	5	1	5	Nominal cost proposed			£100,000.00	£100,000.00	£10,000.00	
7.10		Interface with National Highways / TfGM / Peel / LYB / Wain Estates	Engagement with project stakeholders required.	Protracted communication process resulting in programme delays.	3	4	12	Robust stakeholder management plan.	3	3	9	Nominal cost proposed			£50,000.00	£50,000.00	£10,000.00	
7.11		Sequencing of works to maintain existing business access	Existing gated access at either end of A1 route	Additional constraints imposed upon construction programme. Programme delays.	4	3	12	Understand business requirements along A1 route and programme accordingly.	3	4	12	Nominal cost proposed			£10,000.00	£10,000.00	£2,000.00	
7.12		TM changes due to TMBC network congestion	TfGM change TM due to wider network issues / congestion	Programme delays.	3	3	9	Understand possible CRR interface with wider GM network including diversion routes.	3	2	6	Nominal cost proposed			£10,000.00	£10,000.00	£2,000.00	
7.13		Insufficient consultation, unknown landowners, poor advertising	Consultation process errors	Programme delays.	3	3	9	Use reputable legal team	3	2	6	Nominal cost proposed			£10,000.00	£10,000.00	£2,000.00	
8	**Budget**																		**£8,113,103.37**
8.1		Design Creep	Design status at Feasibility Stage	Additional cost	4	3	12	Ensure design is sufficiently reviewed including buildability during Pre Construction phase	4	2	8	Nominal cost proposed			£50,000.00	£50,000.00	£12,500.00	
8.2		Scope Creep	Design status at Feasibility Stage	Additional cost	5	3	15	Ensure design is sufficiently reviewed including buildability during Pre Construction phase	3	2	6	Nominal cost proposed			£50,000.00	£50,000.00	£12,500.00	
8.3		Quants Risk	Design status at Feasibility Stage	Additional cost	3	3	9	Monitor as appropriate.	2	3	6	Nominal cost proposed			£25,000.00	£25,000.00	£6,250.00	
8.4		Changes in Legislation	Impact on industry of change in Law	Change in cost	3	4	12	Ensure adequate risk provision.	3	4	12	Nominal cost proposed			£10,000.00	£10,000.00	£2,500.00	
8.5		GMCA / TfGM interface	Additional constraints on budget spending	Protracted Pre Construction phase working around granting of funding.	3	3	9	Understand project funding streams and spend constraints.	3	2	6	Nominal cost proposed			£25,000.00	£25,000.00	£6,250.00	
8.6		Inflation in excess of BCIS	External influences	Additional costs.	4	3	12	Ensure adequate inflation mechanism within contract. Carry out works early to mitigate against inflationary increases.	2	2	4	2% of total cost pa over 10 years			£13,146,206.73	£13,146,206.73	£6,573,103.37	
8.7		Scheme funding not being realised	E.g. TfGM withhold funds	Delay / rescoping of scheme	5	2	10	Keep funders informed of progress and costs	5	1	5	Nominal cost proposed			£30,000,000.00	£30,000,000.00	£1,500,000.00	
9	**Legal / Procurement**																		**£47,500.00**

9.1		Procurement level approvals	STAR Procurement interface	Delay in contract exchange Delay in instructions for additional work(s)	3	3	9	Ensure sufficient procurement clearance for upcoming works.	3	2	6	Nominal cost proposed			£50,000.00	£50,000.00	£25,000.00	
9.2		Understanding SCAPE Process	Lack of familiarity with SCAPE process	Protracted contract execution	2	5	10	Ensure familiarity sessions held between parties.	2	3	6	Nominal cost proposed			£10,000.00	£10,000.00	£5,000.00	
9.3		Changes in law	External influences	Additional costs.	3	4	12	Ensure adequate risk provision.	3	4	12	Nominal cost proposed			£25,000.00	£25,000.00	£12,500.00	
9.4		Legal governance	Legal process	Protracted contract execution	4	3	12	Start conversations early with legal to mitigate / minimise delays.	4	2	8	Nominal cost proposed			£10,000.00	£10,000.00	£5,000.00	
10	**General**																	**£6,573,103.37**
10.1		Global instability / global pandemics	Historic precedence	Extraordinary inflation Additional constraints on construction activities	4	3	12	Ensure adequate risk provision.	4	3	12	10% of total cost			£6,573,103.37	£6,573,103.37	£6,573,103.37	
																		£19,149,128.93