MOTT MACDONALD

Warrington East Phase 2 Interim Major Scheme Business Case

February 2018

Warrington Borough Council

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Contents

Executive Summary

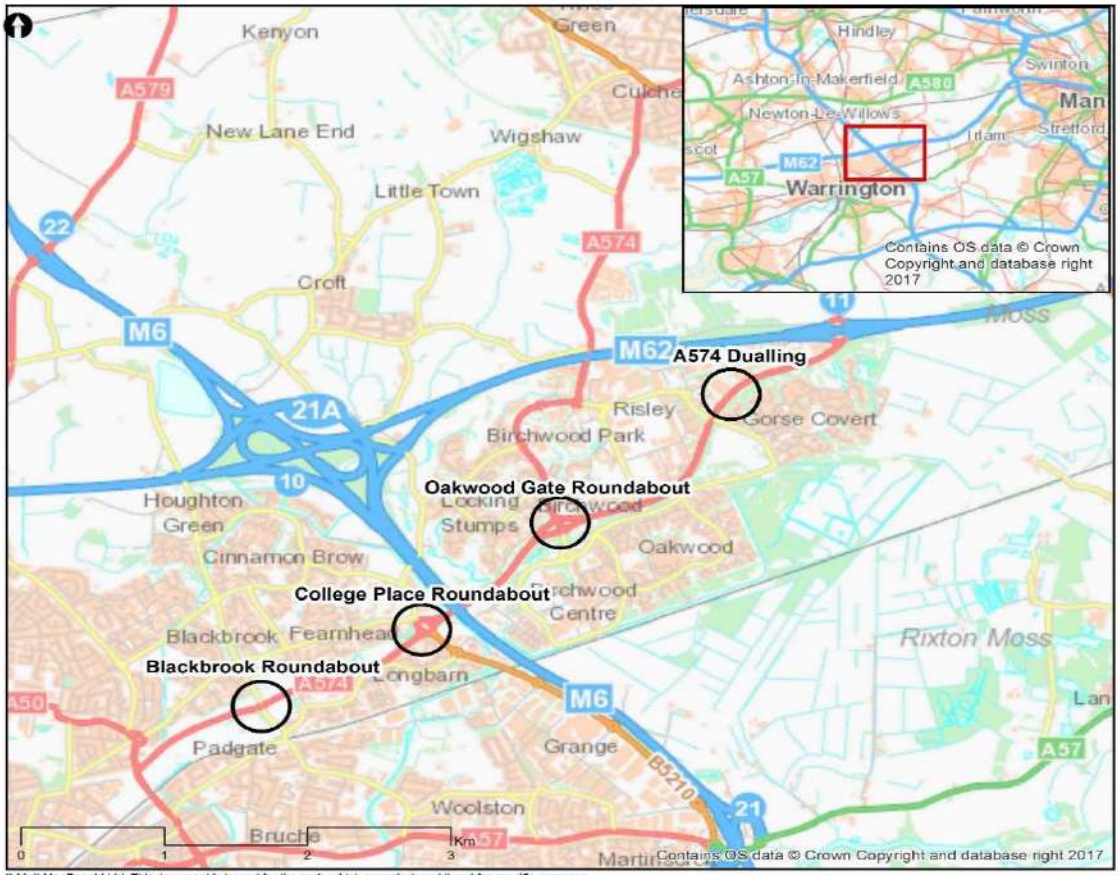
Background

This interim Major Scheme Business Case (MSBC) for the Warrington East Phase 2 scheme sets out the need for investment to address a number of transport problems focusing primarily on the A574, Birchwood Way corridor in Warrington East, which is prone to severe congestion and travel delays. It is the second phase of what was originally a four phase, and is now a three phase, widespread plan of capacity and congestion improvements in east Warrington.

In order to address the congestion issues along the A574 Birchwood Way corridor, funding for the following package of interventions is sought:

1. Partial signalisation of College Place Roundabout. Modification will also be required to increase capacity at Blackbrook Avenue Roundabout as a result of improvements at College Place
2. Partial signalisation of the Oakwood Gate/Birchwood Way Roundabout
3. Partial dualling of Birchwood Way north of the Moss Gate signalised junction

These sites are illustrated below:



Together these measures form a packaged scheme that seeks to better manage traffic flow through and into Birchwood and east Warrington, and to tackle congestion at key pinch points.

This interim MSBC is structured to broadly align with the DfT's recommended five cases model for a Transport Business Case: Strategic; Economic; Financial; Commercial; and Management.

Strategic Case

Situated between the M62 and M6 motorways east Warrington is advantageously located within the strategic transport network and is a key economic hub, composed principally of Birchwood Park, Birchwood Boulevard and Woolston Grange Employment Areas. Providing a vital source of employment for the wider regional economy, the area is home to 400 businesses which employ 17,000 people from across the region; this includes a large number of national and regional headquarters. The area is also home to 12,000 residents.

This access to the strategic transport network has traditionally encouraged development to flourish. However, current congestion issues primarily associated with the A574 Birchwood Way, the main route from the M62 into east Warrington are slowing development and providing access issues for local residents.

Investing in support of transport and wider economic policy

A strong rationale exists for investing in Warrington East Phase 2, seen in the scheme's strong alignment with key objectives of national, regional and local policies. Those key policy objectives are:

- Increasing road capacity
- Tackling congestion
- Improving connectivity
- Enhancing network resilience
- Maximising growth opportunities including support for development and continued growth of Birchwood Park and other key employment sites in east Warrington

Future proofing the local network to support growth

East Warrington originally developed as part of the Warrington New Town plan. This embraced car-borne commuting and involved implementation of a distinctive local road network to support this vision, but original plans were never completed.

Although strategically located in close proximity to the M6 and M62 to facilitate longer journeys, there are a very limited number of access points to/from the strategic network into East Warrington, with J11 of the M62 being the key motorway access point for the area. This, in conjunction with incomplete plans for the original local road network, has led to congestion at key junctions in the area. Factoring in increased development, the constraints of the local road network and its external access to the wider strategic network have become more acute with congestion and delays worsening.

Coupled with forecast population growth and corresponding increased commuter traffic, as well as the need to ensure that the network is capable of supporting Warrington's aspirations for continued economic growth, there is a clear requirement to 'future-proof' the network to be able to cope with existing and forecast demand.

The impacts of local network congestion on the strategic network

Previous studies in relation to the M62 J10 revealed that some of the congestion experienced at J10 is caused by queuing from the A574, Birchwood Way. The single carriageway exit onto the A574 Birchwood Way does not provide sufficient capacity for the level of demand causing traffic to block back onto the circulatory carriageway at J11. Consequently, this queue restricts vehicles from entering the roundabout from the westbound slip road. These impacts on the wider network further support the rational for the scheme.

Impact on travel choices

Over 2.6 million people of working age live within a 30-minute drive of east Warrington and 74% of the workforce commute to the area by car or van.

Buses experience significant delays in the Birchwood area during peak periods due to congestion on the A574 resulting in large variations in journey times and deterring bus use. Undoubtedly this is a key factor as to why just 5.5% of east Warrington's workforce use public transport to travel to work.

Birchwood Station provides train connections to Liverpool and Manchester, but the onward walk to the Birchwood Park employment area takes about 25 minutes, with limited pedestrian crossings and footpaths. Cycle lanes in the area are also minimal, deterring onward journeys from the station by bike. Congestion dominating the area around Birchwood Way makes multi-modal transport using the train and then the bus also unappealing.

Whilst economic strategies based on car-borne commuting are no longer viewed as sustainable or attractive for new development sites, the local network nonetheless needs to be enhanced to maintain economic growth, but in a way that supports access by sustainable modes.

Protecting future development

East Warrington has a thriving economy, but in order to ensure its ongoing success in an increasingly competitive environment, measures need to be put in place to enable it to maintain its strong position in relation to places such as Daresbury Science Park and Airport City. Crucial to the continued success of east Warrington will be the ability to open up land for commercial development, allowing the employment sector here to continue to grow, meeting the demand for employment land expressed by investors.

At present, the transport network cannot accommodate the demand placed on it, making the area a potentially unattractive option for further development.

Warrington East Phase 2 seeks to facilitate the release of land for housing and commercial development through provision of a safe, reliable and well-connected transport network. The provision of additional capacity and improved traffic management as part of this scheme will improve journey times for commuters whilst creating a transport network which is conducive to journey ambience, ultimately promoting the areas reputation as an attractive site for future development.

Strategic and scheme objectives

Identification of the key problems and issues noted above, which establishes a case for the need for investment, led to the development of both scheme specific objectives and wider strategic objectives.

The overarching strategic objectives are shown here, while the scheme objectives noted below are integral to the attainment of these wider strategic objectives for east Warrington and the wider policy objectives noted at the beginning of this section.

1.Improve network resilience to incidents, particularly those arising from the Strategic Road Network to ensure continued mobility reliability for our commercial occupiers

1.Facilitate development and increased occupancy of existing employment land and stock in Birchwood and Woolston Grange to generate additional employment and training opportunities

Improve journey reliability times for both people and goods by reducing congestion at identified pinch points

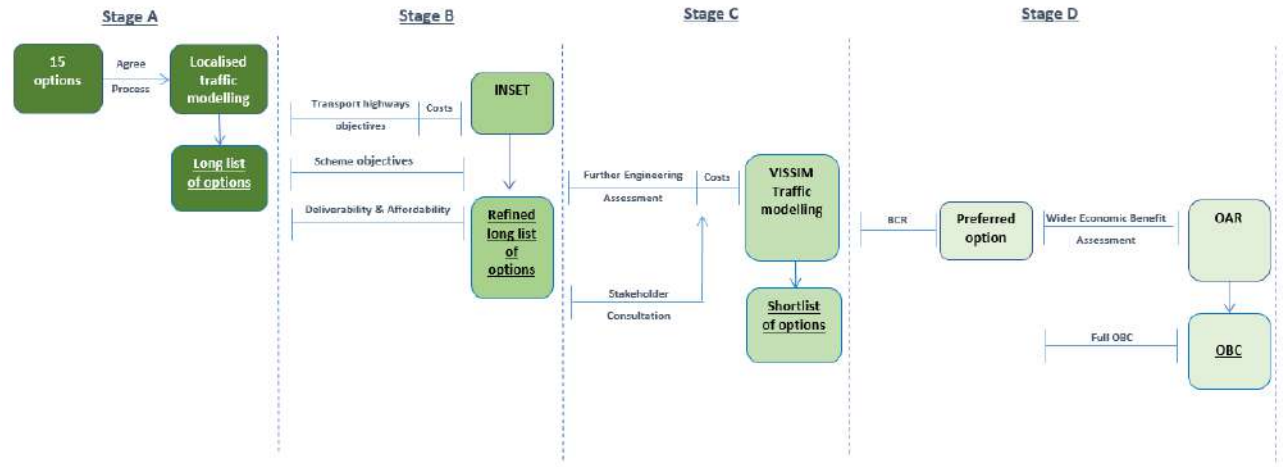
1.Facilitate the release of land for housing and commercial development through provision of a safe, reliable and well connected transport network

Provide a safe, well connected network for cyclists and pedestrians to encourage & facilitate access to existing and future employment by a choice of modes

Improve bus connectivity, journey times and reliability to encourage access to existing and future employment by public transport

Scheme development and optioneering

In response to the key problems and objectives noted above, a number of options at each of the three key intervention sites was developed. A four-stage appraisal process was developed which is illustrated below:



Each of the four stages of appraisal is summarised here:

- Stage A: Localised traffic modelling was undertaken at the initial sift to establish if the option worked in terms of improving congestion so that the junction had sufficient practical reserve capacity.
- Stage B: Assessed those options with sufficient practical reserve capacity, using Mott MacDonald's Investment Sifting and Evaluation Tool (INSET), against weighted criteria developed under two themes:

  - Alignment with objectives; Both the wider and scheme specific objectives were broken down into sub criteria to assess potential alignment at a micro level.
  - Deliverability; the ease with which an option could be delivered in view of land ownership/acquisition issues, physical barriers, ecological constraints and scheme support.
- Stage C: Remaining options at each of the sites were grouped together to form packaged schemes, of which there were only three possibilities; the Oakwood Gate/Birchwood Way site and the Moss Gate partial dualling each proved to have only one viable option, after two rounds of sifting and appraisal, whilst College Place had three viable options. The three packages were then modelled in VISSIM and the total delay measured in junction delay (vehicle hours) recorded for each of the three packages.
- Stage D: Whilst the VISSIM modelling was able to compare the shortlisted packages in terms of reduction in junction delay, it did not take into account scheme cost. Stage D developed indicative BCR's for each of the shortlisted options and the option with the combination of the best BCR and reduced delay was selected as the preferred option to be taken forward and developed in more detail.

Preferred option

The final designs for the scheme components are summarised in the following table.

Preferred scheme components

Element	Description
College Place Roundabout	The final design for the College Place component of the overall scheme comprises of signals on Birchwood Way on both the eastbound and westbound approaches, as well as the southerly Woolston Grange Avenue approach to the roundabout. It is proposed to widen the westbound approach on Birchwood Way East to provide a three-lane entry to the roundabout which would provide additional capacity, particularly during the evening peak when there is severe congestion.
Blackbrook Avenue Roundabout	Blackbrook Avenue/Birchwood Way Roundabout, as a sub component of the College Place intervention, will consist of widening of Birchwood Way to provide an additional lane on the westbound approach to the roundabout, resulting in a left turn lane and an ahead and right turn lane. Traffic signs will be updated and the road markings are to be refreshed at the roundabout. On the northern side of Birchwood Way where the widening is to occur a verge of 5 metres is proposed to allow for the future provision of a pedestrian cycle facility.
Oakwood Gate/Birchwood Way Roundabout	The final design proposed for the site at Oakwood Gate/Birchwood Way Roundabout comprises of the partial signalisation of the existing roundabout with additional signals provided on the westbound approach of Birchwood Way East and a free flow lane from, Oakwood Gate to Birchwood Way West. This would alleviate the congestion on the southern arm approach to the roundabout which at peak times queues as far back as Dewhurst Lane. The free flow lane would become part of the main highway with no merge requirement for traffic entering from the South; instead the merge would be from the outside lane on Birchwood Way West.
Moss Gate/A574 Birchwood Way Partial Dualling	The Moss Gate/A574 Birchwood Way scheme comprises of the partial dualling of the A574 Birchwood Way north of the Moss Gate signalised junction for several hundred additional metres by building an additional carriageway southbound and converting the existing highway into two north bound lanes.

Economic Case

The economic appraisal has been carried out in line with Department for Transport (DfT) Transport Appraisal Guidance (TAG). The primary transport modelling platform is the Warrington East VISSIM Model (base year of 2016), which is a microsimulation model suitable for calculating a BCR for the proposed transport improvements. The economic assessment uses the Department for Transport (DfT) TUBA 1.9.9 (Transport Users Benefit Assessment)

software, which carries out an economic assessment in accordance with published DfT guidance[1].

The economic benefits calculated for the scheme include:

- **Transport economic benefits (TAG A1 and TAG A2.3).** The transport economic appraisal has been undertaken using the TUBA program, which carries out an economic appraisal in accordance with published DfT guidance. This is based on trip and cost matrices from the Warrington East VISSIM Model and travel cost changes implied by the proposed schemes.
- **Accident benefits.** Estimation of accident benefits has been carried out using COBALT, the DfT's tool for accident appraisal.
- **Journey reliability benefits (TAG A1).** The estimate of journey time reliability benefits is made to satisfy the 'Reliable journeys' sub-objectives within the 'Economy' section of scheme appraisal. The calculations assume that the model area is dominated by urban regions and therefore uses the urban journey time reliability calculations that are set out in the TAG unit.

Three options were modelled using the Warrington East VISSIM Model and indicative BCRs calculated based on travel time savings; from this analysis the preferred option was determined. The Options Appraisal Report provides full details (Appendix A).

Assumptions

In order to arrive at the economic benefits, a number of modelling and appraisal assumptions have been adopted. The standard TAG appraisal forms the basis of the approach with specific assumptions and simplifications made to allow best use of available local modelling data, the perceived nature of the schemes and the longevity of their impacts.

- Assessment Period: The Warrington East Phase 2 scheme will impact on both local and strategic traffic movements. On this basis, the TAG recommended assessment period of 60 years has been adopted.
- The economic assessment has been based on 2018 and 2028 traffic modelling where data is readily available from the Warrington East VISSIM Model. These results are then interpolated and extrapolated accordingly (in the modelling and appraisal tools) to obtain economic benefits for all other years, which are then discounted to 2010.
- The traffic modelling has been undertaken for the following weekday time periods:
  - AM (07:45 – 08:45)
  - IP (12:30 – 13:30)
  - PM (16:45 – 17:45)

Model Inputs

Model forecasts have been developed for 2018 and 2028 with matrix growth is based on the forecasts contained in the Department for Transport National Trip End Model (NTEM) which uses TEMPRO[2] software for output of data. The TEMPRO version used for extracting growth trends for this assessment is version 7.2.

The junction improvements have been coded into the model using the same coding procedures used in the development of the model to create two scenarios:

[1] Department for Transport: webtag-tag-unit-a1-1-cost-benefit-analysis
Department for Transport: webtag-tag-transport-appraisal-process

[2] TEMPRO – Department for Transport (DfT) Trip End Model Presentation Program

- without scheme improvements
- with scheme improvements

The without scheme improvements scenario contains two committed schemes:

- M62 NPIF Scheme
- North of Moss Gate dualling

The with scheme improvements scenario contains the committed schemes plus the proposed junction improvements at:

- Blackbrook Avenue
- College Place/Birchwood Way Roundabout
- Oakwood Gate/Birchwood Way Roundabout
- Moss Gate Junction

Model Outputs

The tables below present the impact on junction delay in the without scheme and with scheme scenarios at junctions along the corridor in the Am, PM and interpeak periods.

Junction Delay AM (vehicle hours, in modelled time period)

Junction	2018 without scheme	2018 with scheme	2028 without scheme	2028 with scheme
Fearnhead Lane	52	5	75	19
College Place	56	55	81	77
Oakwood Gate	31	46	46	112
Faraday Street	5	5	6	8
Moss Gate	24	25	79	105
M62 J11	81	79	95	94
Blackbrook Road	36	22	73	47
Total	**284**	**236**	**455**	**463**

Junction Delay IP (vehicle hours, in modelled time period)

Junction	2018 without scheme	2018 with scheme	2028 without scheme	2028 with scheme
Fearnhead Lane	1	1	1	1
College Place	4	17	5	19
Oakwood Gate	13	13	16	15
Faraday Street	1	1	2	1
Moss Gate	10	10	14	14
M62 J11	11	11	37	35
Blackbrook Road	3	3	4	4
Total	**43**	**56**	**78**	**91**

Junction Delay PM (vehicle hours, in modelled time period)

Junction	2018 without scheme	2018 with scheme	2028 without scheme	2028 with scheme
Fearnhead Lane	3	4	3	5
College Place	59	33	98	37
Oakwood Gate	85	28	144	34
Faraday Street	5	3	23	21
Moss Gate	41	66	82	126
M62 J11	146	152	176	173
Blackbrook Road	35	17	45	20
Total	**373**	**302**	**570**	**414**

Scheme Costs for Appraisal

The scheme cost components are shown below. In line with cost guidance in TAG A1.2, a quantified risk assessment (QRA) has been undertaken and an Optimism Bias of 15% has been applied in the appraisal.

Component	Cost (£)
Base Cost	£9,500,537
QRA Cost	£1,651,073
Scheme Total	£13,198,872
Optimism Bias (15%)	£1,979,830
TOTAL	**£15,178,702**

Value for Money Statement

The monetised economic benefits (based on transport modelling outcomes) show that the scheme produces an initial BCR of **3.27** from Present Value of Benefits of **£38.82m** (2010 prices, discounted to 2010) and a cost to public accounts of **£11.88m** (2010 prices, discounted to 2010).

Assessment summary (in £000s, 2010 prices if not stated)

BCR Element	Initial BCR	Adjusted BCR
Scheme Costs in 2018 prices	13,198	13,198
Scheme Costs including risk and optimism bias of 15% in 2018 prices	15,179	15,179
(All entries below are present values discounted to 2010, in 2010 prices)		
Cost to Public Accounts (including risk and optimism bias of 15%)	11,699	11,699
Main Transport Economic Benefits	37,059	37,059
Journey Time Reliability Benefits	-	1,955
Accidents	1,761	1,761
Present Value of Costs (PVC)	11,881	11,881
Present Value of Benefits (PVB)	38,820	40,775
Benefit to Cost Ratio (BCR)	**3.27**	**3.43**

According to DfT guidance and criteria[3], the initial BCR of **3.27** calculated based on transport benefits alone yields **High Value of Money**. The modified BCR (including an estimation of agglomeration and welfare benefits) is **3.43,** which also represents **High Value of Money.**

The adjusted VfM assessment includes:

- Journey time benefits to transport users
- Journey time reliability benefits
- Accident benefits

It can be concluded from this assessment that the Warrington East Phase 2 scheme produces a **Strong Value for Money** case.

Financial Case

The Financial Case presents the financial profile of the scheme and an overview of how the scheme will be funded.

Indicative costs of the Warrington East Phase 2 scheme have been produced by Balfour Beatty; these are due to be updated and finalised in March 2018. These indicative costs can be found in the table below and include an allowance for risk based on the indicative Quantified Risk Assessment (QRA).

Scheme costs adjusted for risk

Cost Item	Preferred Option Package
Land acquisition etc.	£37,000
Professional fees	£1,285,505
Statutory undertakings	£724,757
Works	£9,500,537
Sub-total	**£11,547,799**
QRA	£1,651,073
Total	**£13,198,872**

[3] Value for Money Assessment: Advice Note for Local Transport Decision Makers, Department for Transport https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267296/vfm-advice-local-decision-makers.pdf

An amount of £590,000 to account for inflation has been accounted for in the above cost estimates in accordance with the Tenders Price Index and RPI. This was calculated by applying a midpoint inflation rate as at February 2019 (8.5%) to the construction cost of around £6.9m.

The table below shows the annual spend profile. The amount for quantified risk has been proportionally allocated to the Works cost item, in accordance with the level of spend on Works each year.

Maintenance and operational costs

As costs are currently indicative, maintenance costs have not been included at this time. Maintenance costs will become part of the maintenance and operations costs for the transport networks of Warrington Borough Council.

Operational costs of Warrington East Phase 2 are being given consideration and will be included when final scheme costs are known, though it is expected that they are likely to be quite low.

Funding arrangements

The table below shows the funding split, over the project lifetime by funding source.

Funding source	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Local growth Fund	£117,067	£744,274	£3,589,255	£1,616,711	£752,028	**£6,819,335**
WBC borrowing	£67,101	£426,609	£2,057,319	£926,680	£431,054	**£3,908,763**
Enterprise Zone	£33,933	£215,731	£1,040,364	£468,612	£217,979	**£1,976,619**
Private sector	£8,483	£53,933	£260,091	£117,153	£54,495	**£494,155**
TOTAL	**£226,584**	**£1,440,547**	**£6,947,029**	**£3,129,156**	**£1,455,556**	**£13,198,872**

Source: Warrington Borough Council

Following a meeting of the WBC Executive Board in April 2017, the totals shown above for each funding contributor were rounded up to provide an overall funding figure of £13,355,000.

Commercial Case

The Commercial Case provides evidence on the commercial viability of the scheme and the procurement strategy used to engage the market. WBC's procurement strategy has been designed to ensure:

- Value for Money
- Compliance with legislation
- Avoidance of fraud and corruption
- Delivery of WBC's visions and ambitions

A number of procurement options were considered for Warrington East Phase 2, as follows:

Potential Procurement options

Design and construct	Early contractor involvement
SCAPE national civil engineering and infrastructure framework 2015	Use of a PQQ to produce a bespoke framework of contractors
Open invitation to tender (OJEU procurement) to select a single contractor for all works	Private finance initiative
Other open framework agreements	Mini competition among suppliers on the North West Construction Hub Framework

Procurement options were assessed on their ability to:

- Achieve cost certainty
- Minimise costs
- Achieve and efficient delivery programme
- Ensure appropriate design and end product quality
- Provide continuity of Project Knowledge.
- Obtain contractor input to risk management and appraisals
- Engage with contractors and stakeholders to support development of buildable and deliverable proposals

Based on the above assessment, Warrington East Phase 2 will utilise two sourcing frameworks, one for consultancy services and one for construction:

The Transportation and Public Realm Consultancy Services Framework was selected for provision of consultancy services as it is an established framework enabling quick and efficient provision of expertise up to value of the OJEU funding limits.

The SCAPE framework has been selected as the preferred option as it possesses several advantages that alternative procurement options fail to provide. The framework provides a strong balance of risk, control and cost certainty, thus enabling good overall value for money. The SCAPE framework offers a low-risk and established route to market and the success of the Birchwood Pinch Point Project (Warrington East Phase 1) provides assurance and confidence that Warrington East Phase 2 can be delivered through the SCAPE framework. Furthermore, the achievements that were accomplished with Phase 1 demonstrates the value that Balfour Beatty can offer in delivering infrastructure projects for WBC.

Risk allocation and transfer

The risks associated with the Warrington East Phase 2 and their likely level of impact in terms of time and cost form the basis of the Quantified Risk Assessment (QRA) which sets out scheme risks on a quantified basis. The key risks categories relevant to the Commercial Case are:

- Construction programme risk
- Procurement risk
- Cost risk
- Provider risk

Balfour Beatty has been assigned risks associated with estimations of the quantities, mitigation measures and resources. WBC will take responsibility for risks that are associated with land, planning and environmental permissions, including the responsibilities of land acquisition and obtaining planning approvals.

Management Case

The Management Case assesses whether a proposal is deliverable. It looks at the project planning, governance structure, risk management, communications and stakeholder management to establish if adequate resources are in place to ensure delivery on time, on budget and in accordance with specifications

Evidence of similar projects

Warrington Borough Council has had proven success in a number of highways projects. The table below provides a summary of the most relevant.

Project	Cost	Delivered on time	Delivered to budget
Warrington East Transport Strategy Phase 1: Birchwood Pinch Point	£5.23 million	Yes	Yes
M62 Junction 8	£12 million	In progress but on schedule	In progress but on target

Warrington East Transport Strategy Phase 1: Birchwood Pinch Point consisted of several junction improvements along the A574 Birchwood corridor at the Oakwood and Moss Gate roundabouts. The scheme also included a new bus only link between Ordnance Avenue and Faraday Street. Against a budgeted cost of £5.23 million, the scheme outturned at £5.0 million. Phase 1 was delivered by Balfour Beatty and successfully managed through the SCAPE National Civil Engineering and Infrastructure Framework which is the procurement option recommended for delivery of Phase 2; this established relationship provides assurance and confidence that this scheme can also be delivered successfully.

Construction of the M26 J8 scheme began in 2017 and is still in process. Figure 56 details the scheme specifics, which are comparable in scope and cost to some of the interventions being undertaken as part of Warrington East Phase 2. Although not yet complete, at a similar cost, and being delivered through Balfour Beatty, this scheme is directly comparable with Warrington East Phase 2. Given that the scheme is also being funded from both the C&W LEP and WBC it provides assurance that established reporting procedures with the C&W LEP are in place.

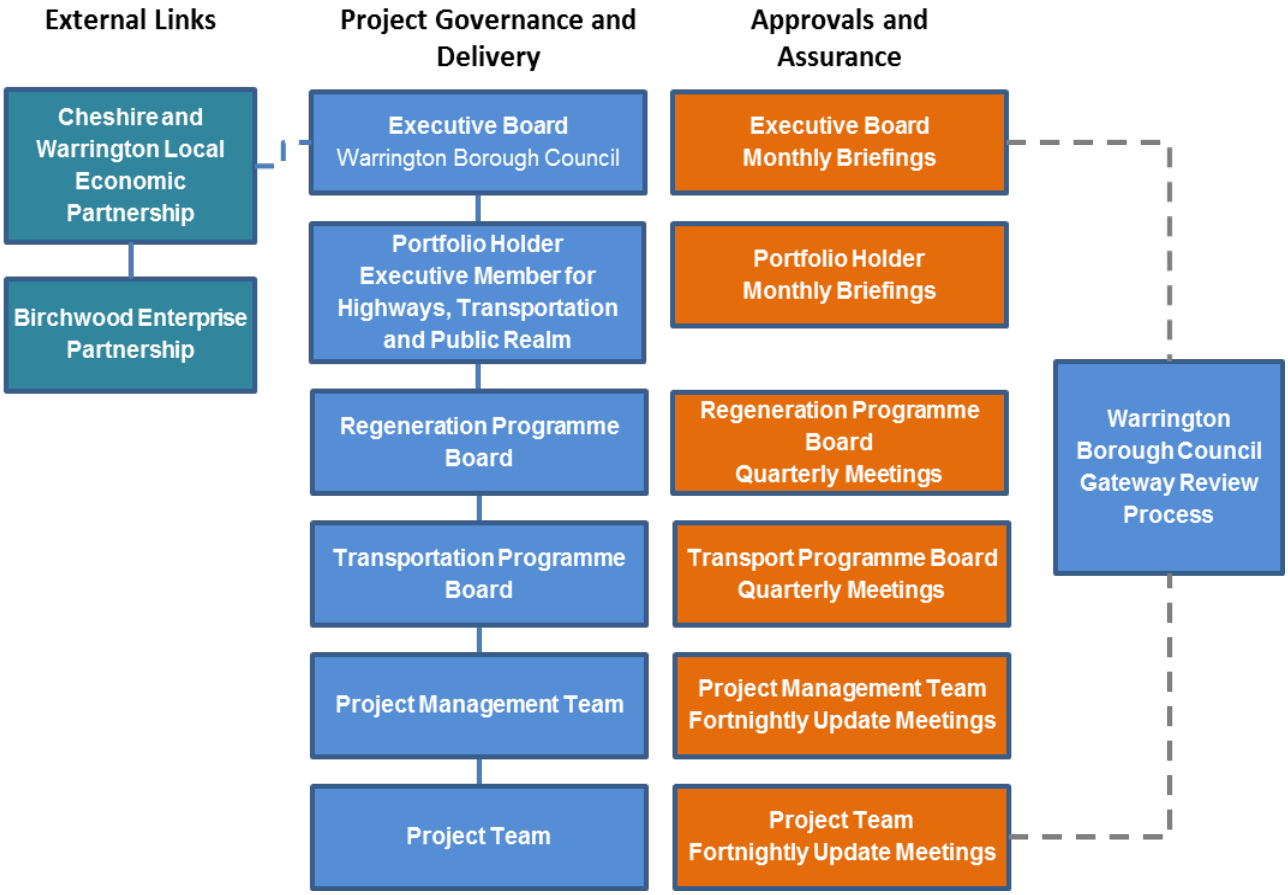
Programme/project dependencies

To realise the Warrington East Phase 2 programme, a set of project dependencies have been identified, these are outlined below:

- C&W LEP approval of Warrington East Phase 2 Scheme
- Confirmation of private sector contributions to the scheme as costs are still indicative
- Agreement of the construction contract
- Approval by Executive Board to allocate both budget and resources
- Appropriate utilisation of project resource

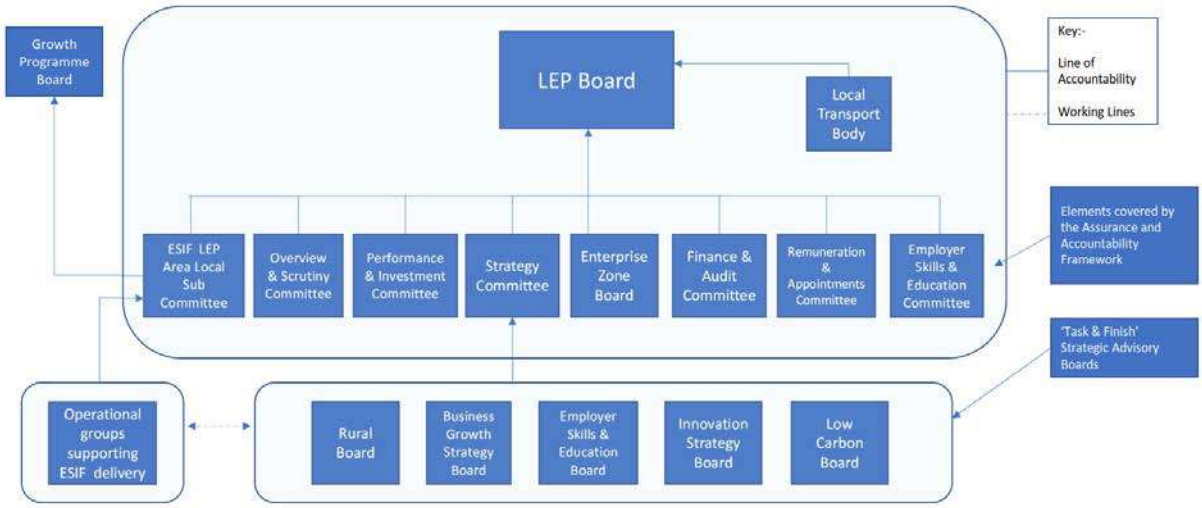
Governance

Given that the scheme is being funded by both the C&W LEP and WBC, it is important to recognise that both these organisations have independent organisational structures. As scheme promotor, the governance arrangements, structure and role of WBC for the whole of the Warrington East Phase 2 is set out below.



As the key funding source for the scheme the C&W LEP have an integral interest in ensuring in the Warrington East Phase 2 is delivered on time and to budget. This section sets out the governance structure of C&W LEP and the role of the Performance and Investment Committee who have delegated authority to grant funding for Warrington East Phase 2. They will also:

- Provide scrutiny and oversight to funded schemes;
- Monitor programme performance; and
- Ensure that the processes set out in the LRP's Assurance and Accountability Framework are adhered to.



Source: C&W LEP

Assurance

To satisfy funding conditions Warrington East Phase 2 will be delivered in line with the LEP Growth Programme Assurance and Accountability Framework. This framework provides a mechanism for Warrington Borough Council, the LEP and key stakeholders to be clear about their responsibilities and to ensure good project governance.

The framework includes the appointment of an independent technical advisor to review the Business Case and Value for Money appraisal on behalf of the LEP. For Warrington East Phase 2, Cheshire & Warrington LEP have appointed a reviewee from WSP Parsons Brinckerhoff.

Approvals Plan

The progression of Warrington East Phase 2 is subject to the following approvals schedule:

Milestone	Estimated date
Submission of OBC to WSP Ltd for review and assurance	21st February 2018
Submission of Business Case to C&W LEP for conditional approval	14th March 2018
C&W LEP Performance and Investment Committee conditional approval	21st March 2018
WBC Executive Board meeting for final approvals	9th April 2018
Public exhibition explaining scheme and construction process	Early May 2018
Construction commences	End May 2018

Source: Warrington Borough Council

The conditional approval submission in March 2018 will provide approval for WBC to draw down on LEP funding, conditional in that monies would need to be paid back if Warrington East Phase 2 was ultimately not delivered.

Project delivery plan

The construction programme for the Warrington East Phase 2 scheme has been produced with the advice of Balfour Beatty who has been providing the council with early contractor involvement.

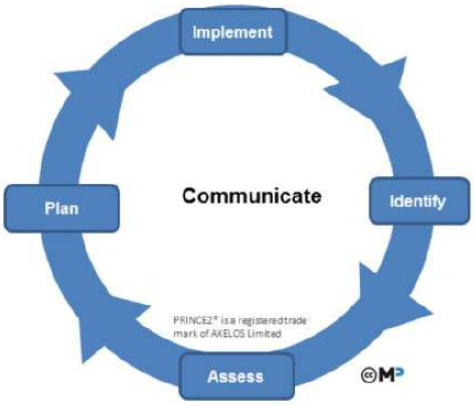
The key milestones and associated delivery dates for Warrington east Phase 2 are noted below.

Key project milestone	Date
RIBA Stage 3	
Completion of Outline Business Case with indicative costs)	March 2018
Provision of final costs	March 2018
Quantified Risk Assessment (QRA)	March 2018
C&W LEP Performance and Investment Committee conditional approval	March 2018
Finalise Outline Business Case with updated costs	April 2018
RIBA Stages 4 & 5	
Construction design – Main works	January 2018
Construction Contract Award	April 2018
Construction – Main Works (mobilisation)	April 2018
Construction Phase Main works	May 2018
Scheme Completion	March 2021 (at the latest)

Risk management

An effective risk management strategy for the project will be based on the principles for risk management contained within the OGC PRINCE2 guidance.

Balfour Beatty's risk management process has been developed through the delivery of over £300m of schemes in the North West region in the last three years proving its value and effectiveness when avoiding project delays or cost increases.



Through this process Balfour Beatty have produced a risk register as part of their Quantified Rias Assessment process and this identifies 41 risks, which they have categorised as either:

- Programme
- Design
- Cost
- Health, safety & environment

These risks focus on actual physical delivery of the scheme and are collectively classified in this report as **Scheme delivery risks**: those affecting the cost, scope and timescale for the project.

WBC and Mott MacDonald have, in addition, collectively identified wider risks to the project and WBC, these are classified as **Programme management risks** and are categorised as:

- Strategic risk
- Political risk
- Management risk
- Funding risk

The overall risk management strategy will be owned by the SRO, however, the day-to-day management of the programme management risks will be managed by the Client Project

Manager and the scheme delivery risks will be managed by the Programme Manager of the Infrastructure Delivery Services and Balfour Beatty as the delivery partner.

Contract management

The construction contract with Balfour Beatty is a NEC3 through the SCAPE National Civil Engineering and Infrastructure Framework 2015. The NEC suite of contracts are well understood and are a tried and tested set of contracts used on large scale construction schemes.

Communication and stakeholder management

Key stakeholders are noted below:

Warrington Borough Council Executive Board	Ward Councillors
Parish Councils	Bus operators
Highways England	Local businesses
Commuters working in Birchwood and Woolston	Residents of Birchwood and Woolston
Visitors to Birchwood Shopping Centre, Woolston neighbourhood hub, Birchwood tennis centre, local libraries and other key destinations	Parents of children attending nearly Birchwood and Woolston schools

Stakeholder engagement ran from the end of April to the end of June in 2017. In summary, feedback to key questions is noted below:

Key questions	Yes (%)	No (%)	Total responses
Do you support the proposed changes to the College Place roundabout?	65 (72)	25 (28)	90
Do you support the proposed improvements to the southern end of the Oakwood Gate roundabout?	71 (86)	12 (14)	83
Do you support the proposed extension of the merge lane on Birchwood Way at the Moss Gate junction?	66 (76)	21 (24)	87

Source: Warrington Borough Council

Monitoring, evaluation and benefits realisation

A detailed benefits realisation plan has been produced and it defines how the benefits of Warrington East Phase 2 will be identified and measured. This is closely linked to the Monitoring and Evaluation Plan which provides an overview of the technical requirements for measuring scheme inputs, outputs, outcomes, impacts and eventual realisation of benefits. Reporting

Monitoring and evaluation will be reported in two stages:

- Scheme delivery – reporting on scheme build, scheme delivered and cost measures.
- One year after scheme delivery – primary aim to understand the impact of Warrington East Phase 2 on journey times and travel patterns.

1 Headline Introduction

Warrington Borough Council has been awarded funding through the Cheshire and Warrington Growth Deal for the period 2019/20 to 2020/21 for Warrington East Phase 2. Mott MacDonald has been commissioned on behalf of Warrington Borough Council (WBC) to produce a Major Scheme Business Case (MSBC) for the Warrington East Phase 2 works, which are located along the A574 Birchwood Way corridor.

However, it should be noted that due to finalised costs and a finalised Quantified Risk Assessment (QRA) from Balfour Beatty being unavailable in time for the Cheshire West and Chester Local Enterprise Partnership (CWAC LEP) P&I Board meeting to be held March 21st 2018, this document presents an *interim* MSBC based on indicative costs and QRA in the Financial Case and an indicative BCR in the Economic Case. The document will be reissued as a final MSBC once the missing data is received and processed.

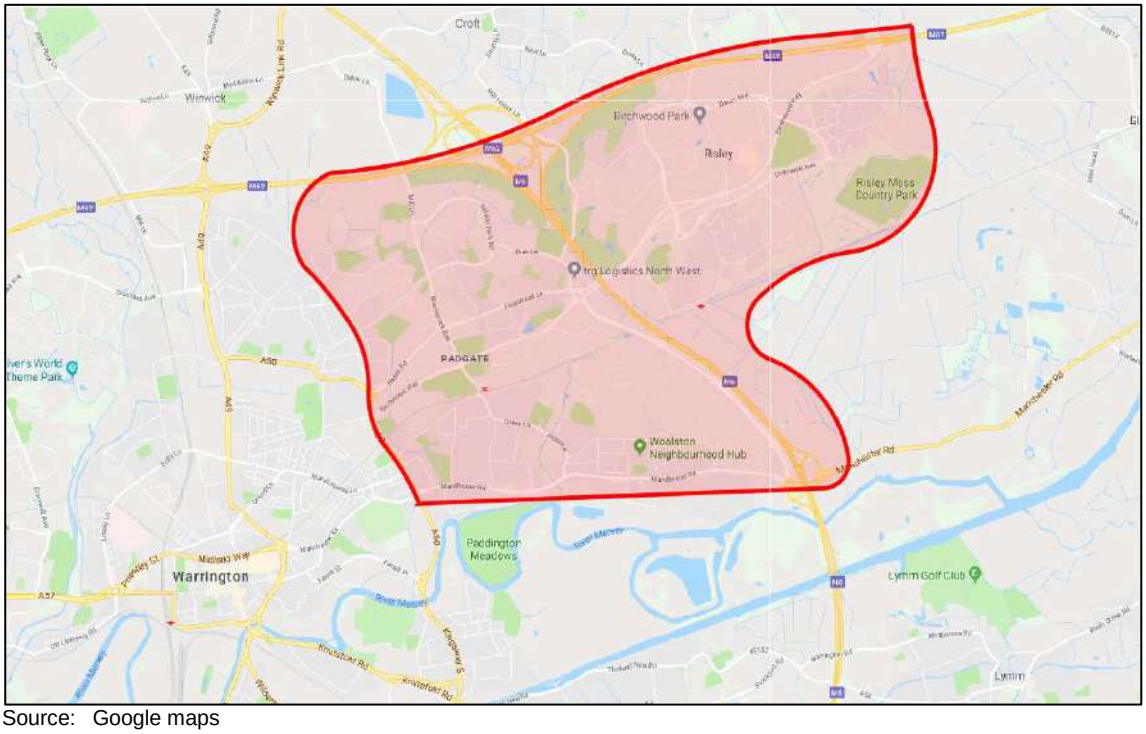
1.1 Scheme background in brief

Warrington East Phase 2 is the second phase of what was a four-phase, and is now a three-phase, scheme to deliver highway capacity and congestion improvements in east Warrington. The first phase was delivered in March 2016 and Phase 2 seeks to build on the success of the Phase 1 interventions. The history of the overall scheme development is noted in greater detail in the Strategic Case that follows this brief introductory section.

1.2 Scheme headline description

The scheme seeks to address a number of transport problems focusing primarily on the A574, Birchwood Way corridor in Warrington East. Warrington East is defined as the area east of the A50 stretching as far as Risley Moss, and bounded to the south by Manchester Road and to the north by the M62 as shown in Figure 1.

Figure 1: Geographic coverage of Warrington East



Source: Google maps

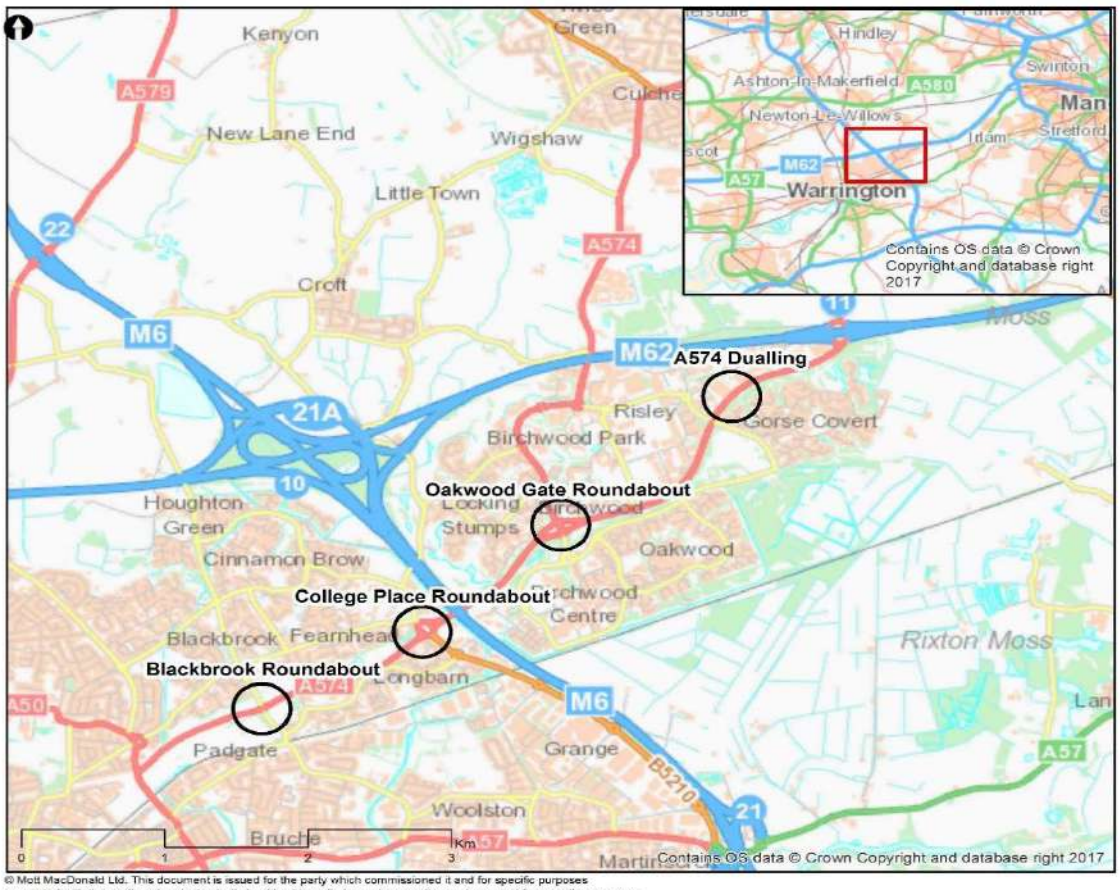
The A574, Birchwood Way is prone to severe congestion and travel delays and this scheme will modify a number of junctions along the route in order to remove severe network pinch points and ensure more reliable and efficient movement of people and goods between the strategic highway network and the wider Warrington area to east Warrington.

Warrington East Phase 2 is comprised of highway interventions to increase capacity and reduce congestion at three primary locations along the A574 corridor:

- College Place Roundabout
- Oakwood Gate/Birchwood Way Roundabout
- Moss Gate/A574 Partial Dualling

Additional modification to Blackbrook Avenue Roundabout is also required as a direct consequence of the improvements at College Place roundabout. This is not therefore considered in this report as being a scheme element in its own right, but rather a sub component of College Place Roundabout.

Figure 2: Location of Warrington Phase 2 scheme components



Source: Mott MacDonald

1.3 Scheme headline benefits

The interventions noted above will deliver congestion relief and improvements to capacity on the network in east Warrington. These will support the delivery of strategic headline benefits as journey time reduction and improvement to journey reliability for both the movement of people and goods foster:

- Maximisation of Warrington's potential as part of the Northern Powerhouse
- Economic growth and employment in Warrington East
- Support of Birchwood Enterprise Zone and contribution to the delivery of the aims and objectives of the SEP Economic Plan, Local Plan and the aspirations of Warrington Means Business
- Making Warrington East a place where people want to live and work.

1.4 Report structure

This document is structured in accordance with the DfT's Guidance for Transport Business Cases, published in January 2013, which captures the 'Five Case' process approach. Following this introduction, the remainder of the document is structured as follows:

- **Section 2-17**: The Strategic Case – this section identifies the key issues and opportunities that the scheme is aiming to address in line with the core objectives of the scheme and wider strategic objectives outlined within policy. The Strategic Case is detailed over several distinct sections as its draws together a sizeable evidence base to establish a strong case for investment.
- **Section 18**: The Economic Case – this section demonstrates the value for money for the scheme including the impact on the economy, environment and society, based on an appraisal framework consistent with the DfT business case guidance.
- **Section 19**: The Financial Case – this section presents an assessment of affordability, overall scheme costs and funding certainty. It outlines how the costs and the scheme are to be funded/financed, including the structuring of any borrowing and the position of the relevant parties.
- **Section 20**: The Commercial Case – a summary of the procurement strategy, pricing and payment mechanisms and risk allocations.
- **Section 21**: The Management Case – sets out clear proposals for governance, project planning, risk management, stakeholder management and evaluation.

Strategic Case

Sections 2-17

2 Strategic Case Overview

The core elements of this Strategic Case include scheme history and progress to date, the identification of the need for intervention, the evidence base upon which that need is based and the keys aims and objectives that have been developed as a result. It also identifies the preferred scheme option and an overview of how the option was developed and selected. A full account of the options generation and appraisal process is provided in the accompanying Options Appraisal Report (OAR).

2.1 Approach to development of the Strategic Case

The Strategic Case has been structured to broadly align with the DfT's *'The Transport Business Case: Strategic Case'* which outlines key areas that should be covered as part of the business case documentation. It has however been slightly modified in terms of order and structure and takes proportionality, in terms of the size of the scheme, into account. Table 1 shows where the relevant information, in accordance with DfT requirements can be found in the subsequent sections and sub-sections that make up the Strategic Case.

Table 1: DfT requirements for the Strategic Case

Content	DfT requirements	Section number and title(s)
Introduction	Outline the approach taken to assess the Strategic Case and the study area	2.1: Approach to development of the Strategic Case 3.1: Warrington East defined
Project definition	Provide an update on previous work	3: Scheme Definition and Context
Business strategy	Provide the context for the business case by describing the strategic aims and responsibilities of the organisation responsible for the proposal	4: Policy Review 15:1: Strategic objectives and aims for Warrington East
Problem identified	Describe the problems including the evidence base underpinning this? Justification for intervention?	6: An Overview of Warrington 7: Socio-economic Review 8: The Strategic Highway Network 9: The Local Transport Network 10: How People Travel 11: Economy and Business 12: Land Use and Development 13: Summary of Problems and Opportunities
Impact of not changing	What is the impact of not changing?	14: The Need for Intervention 14.6: Impact of not changing
Internal drivers for change	What is the driving need to change e.g. improved technology, new business/ service development as a result of policy? (Non-compulsory)	Not included as not applicable and not compulsory
External drivers for change	What is the driving need to change e.g. legislation, pressure from public/ other departments? (Non-compulsory)	Not included as not applicable and not compulsory
Objectives	Establish specific, measurable, achievable, realistic and time-bound objectives that will solve the problem	15:1: Strategic objectives and aims for Warrington East

Content	DfT requirements	Section number and title(s)
	identified. Ensure that they align with the organisation's strategic aims	
Measures for success	Set out what constitutes successful delivery of the objectives	15.3: Measures for success
Scope	Explain what the project will deliver and also what is out of scope	15.4: Scope
Constraints	High level internal/external constraints e.g. technological environment, capability to deliver in-house major contracts with provider, etc.	17.4: Potential scheme constraints
Interdependencies	Internal/ External factors upon which the successful delivery of project are dependent	17.5: Scheme interdependencies
Stakeholders	Outline the main stakeholder groups and their contribution to the project. Note any potential conflicts between different stakeholder groups and their demands	3.5: Key Stakeholders Appendix B: Stage 1 Stakeholder Engagement Report
Options	Set out all the options identified (including low cost alternative) and evaluate their impact on the proposal's objectives and wider public policy objectives. Risks associated with each option should be identified as should any risks common to all options	16: Options Development and Appraisal 17: Preferred Scheme Appendix A: Options Appraisal Report

Source: DfT

2.1.1 Key tasks in the development of the Strategic Case

The key tasks undertaken to develop the strategic case are as follows:

- Review of the overall multi-phased Warrington East scheme to date, looking at progress in terms of Phase 1 and its outcomes, and how Phase 2 relates and builds on these.
- Identification of the strategic aims and objectives of Warrington Borough Council (WBC), to set the scheme within the wider context and how it can contribute to achieving those wider strategic aims.
- Compilation of a themed evidence base to inform the need for intervention that looks not only at transport issues but also relevant wider issues that are relative to the strategic aims of the Council.
- Identification of scheme specific objectives which provide the basis, in addition to the problem setting exercise, for the agreed scheme scope.
- Consideration of scheme practicalities including identification of the key stakeholders, (undertaken by WBC) as well as the major project constraints and inter-dependencies.
- As part of the options appraisal process, development of a long-list of options and an assessment process to define a short list of option packages and ultimately a preferred option.

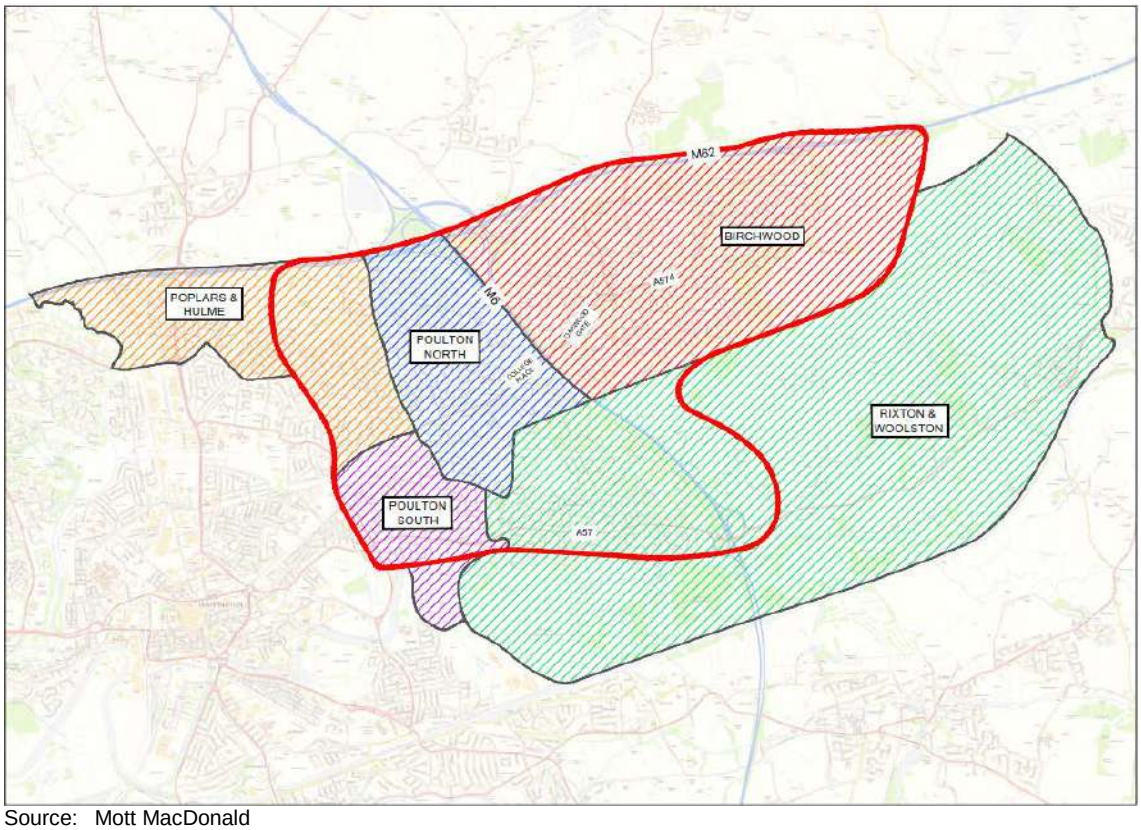
3 Scheme Definition and Context

This section provides an overview of the strategic context and rationale for the development of the wider phased scheme to deliver capacity and congestion improvements in Warrington East. It also provides a synopsis of the historic development of the wider scheme and progress to date. Finally, it provides detail on the scheme to be delivered in Phase 2 which is the focus of this interim MSBC, including work undertaken previously.

3.1 Warrington East defined

Warrington East is defined as the area east of the A50 stretching as far as Risley Moss, and bounded to the south by Manchester Road and to the north by the M62. The boundary of the study area is shown in Figure 3 and includes the wards of Birchwood, Poulton North and large parts of Poulton South, Rixton & Woolston and Poplars & Hulme.

Figure 3: Geographic coverage of the study area



Source: Mott MacDonald

3.2 Overview of strategic need for capacity improvements in Warrington East

Warrington East is a key economic hub, composed principally of Birchwood Park, Birchwood Boulevard and Woolston Grange Employment Areas. Providing a vital source of employment for the wider regional economy, the area is home to 400 businesses which employ 17,000 people

from across the region; this includes a large number of national and regional headquarters. The area is also home to 12,000 residents.

Situated between the M62 and M6 motorways, Warrington East, including Birchwood and Woolston Grange, has an advantageous geographic location within the strategic transport network. This has traditionally encouraged development to flourish. However, current congestion issues primarily associated with the A574 Birchwood Way – the main route from the M62 into east Warrington – have stunted future development and limited take up of current provision for businesses in the area[4].

The strategic location of Warrington East has undoubtedly provided a unique factor of attraction for large businesses. It is equidistantly located between the Northern Powerhouses of Manchester and Liverpool and advantageously positioned adjacent to the M6, M62 and M56. The area therefore boasts strategic accessibility to the wider region and nationally significant travel corridors, such as One North and the Atlantic Gateway Corridor.

This excellent strategic connectivity has resulted in east Warrington having access to one of the largest labour pools outside of London, being able to draw on employees with varied skill sets, including senior professionals, academics and scientists from a wide geographic area.

Warrington East has firmly established itself as a hotspot of economic importance within the North West of England. Historically, the area has been associated with the attraction of high profile commercial organisations and the sector has flourished, with Birchwood Park and Woolston Grange employment sites at the core. More recently the area has become a Nuclear Industry Hub attracting influential organisations such as the Nuclear Decommissioning Authority, Sellafield Ltd, AMEC and Assurance Quintessa.

In addition to the area's economic importance, east Warrington is currently home to 12,000 residents and has been identified in the Strategic Housing Land Availability Assessment (SHLAA) as having the potential to provide 10.5% of the wider Borough's housing supply within a 15-year period. The Warrington Local Plan Preferred Development Option has identified around 60 new homes and over 8.5 hectares of new or re-allocated employment land which would benefit from improved highway infrastructure along Birchwood Way. Without intervention, further residential development and investment in employment sites has the potential to increase the pressure on a burgeoning road network already at breaking point.

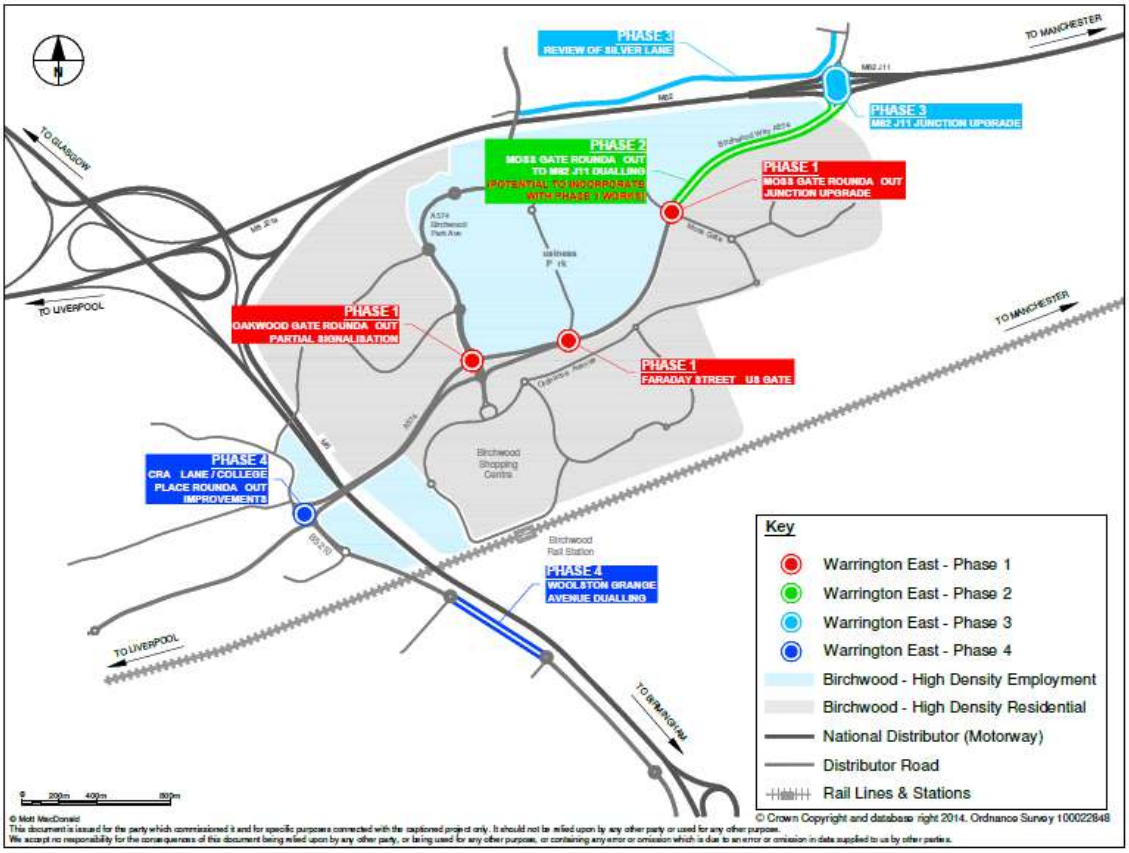
However, Warrington East has arguably been a victim of its own success and substantial traffic problems exist along the A574 corridor that cause serious problems for both east Warrington residents and its workforce, particularly during peak hours. This is covered in detail in the themed evidence review; Sections 6-13. Successful implementation of capacity improvements at key pinch points is vital in addressing serious network delay and driver discomfort along the A574, whilst ensuring east Warrington's key employment sites remain accessible and desirable locations to both work and invest

3.3 Warrington East scheme background

Warrington East Phase 2 is the second phase of what was a four-phase network pinch point improvement scheme which is taking place in Birchwood. The location of works relating to the initial four phases are shown in Figure 4.

[4] Mickledore- Economic Strategy Warrington East

Figure 4: Location of Warrington East Phase 1-4 works



Source: Mott MacDonald

3.3.1 Phase 1

Phase 1, delivered through Growth Deal funding from government and the Cheshire and Warrington Local Enterprise Partnership was completed in March 2016. The components of Phase 1 are described here in greater detail together with the emerging benefits.

Warrington East Phase 1:

- Introduction of two-way traffic signals to the northern end of the Oakwood Gate roundabout and re-alignment of Birchwood Way to create a three-lane approach to the junction and refresh of all signs, street lighting and road markings at the junction. This has in part helped to minimise the effects of peak time congestion.
- Creation of a new bus only link between Ordnance Avenue and Faraday Street which incorporates Phase 1 of the Warrington bus lane enforcement system. New signs, road markings and replacement of street lighting also took place. This intervention has helped to shorten bus journeys between north and south Birchwood for the 17C, 25 and 28 services.
- Conversion of the Moss Gate roundabout to a four-way signal controlled junction, with widened approaches on Birchwood Way, improved highway drainage, diversion of utilities, installation of two sets of pedestrian crossings and a refresh of all road markings, signs and street lighting. Work here has helped to reduce peak hour queues.

3.3.2 Phase 2

Since the initial inception of the phased programme of improvement outlined above, the College Place Roundabout intervention identified in Figure 4: as being 'Phase 4', has been modified and is now included as part of Phase 2, however the dualling of Woolston Grange is not included.

In addition, further improvements at the Oakwood Gate/Birchwood Way roundabout that were not included as part of the initial 4-phase pinch point programme are now included as part of Phase 2. The components of the amalgamated and modified Phase 2 and 4 which will be funded through the Cheshire and Warrington Growth Deal and Warrington Council's own Capital Investment Programme are noted here, and onwards are referred to collectively as Phase 2.

Warrington East Phase 2:

- Partial signalisation of College Place Roundabout with signals on Birchwood Way on both the eastbound and westbound approaches and on the Woolston Grange Avenue approach. In addition, the westbound approach on Birchwood Way East will be widened to provide a three-lane entry to the roundabout which would provide additional capacity, particularly during the evening peak when there is severe congestion. Modification will also be required to increase capacity at Blackbrook Avenue Roundabout as a result of improvements at College Place.
- Partial signalisation of the Oakwood Gate/Birchwood way Roundabout with additional signals provided on the westbound approach of Birchwood Way East and a free flow lane provided from, Oakwood Gate to Birchwood Way West to alleviate the congestion on the southern arm approach.
- Partial dualling of Birchwood Way north of the Moss Gate signalised junction for several hundred additional metres by building an additional carriageway southbound and converting the existing highway into two north bound lanes.

Phase 2 seeks to build on the progress of Phase 1 and enable the suite of highways to continue to improve travel within east Warrington. The overall aims of the project are to reduce traffic delay at congested junctions and pinch points; improve connectivity for public transport, pedestrians, and cyclists; and facilitate further development and maximise the growth potential of east Warrington.

3.3.3 Phase 3

Phase 3 will upgrade the eastern gateway into Warrington and the Birchwood Enterprise Zone and will be partially funded by the National Productivity Investment Fund (NPIF) and partially by Warrington Borough Council.

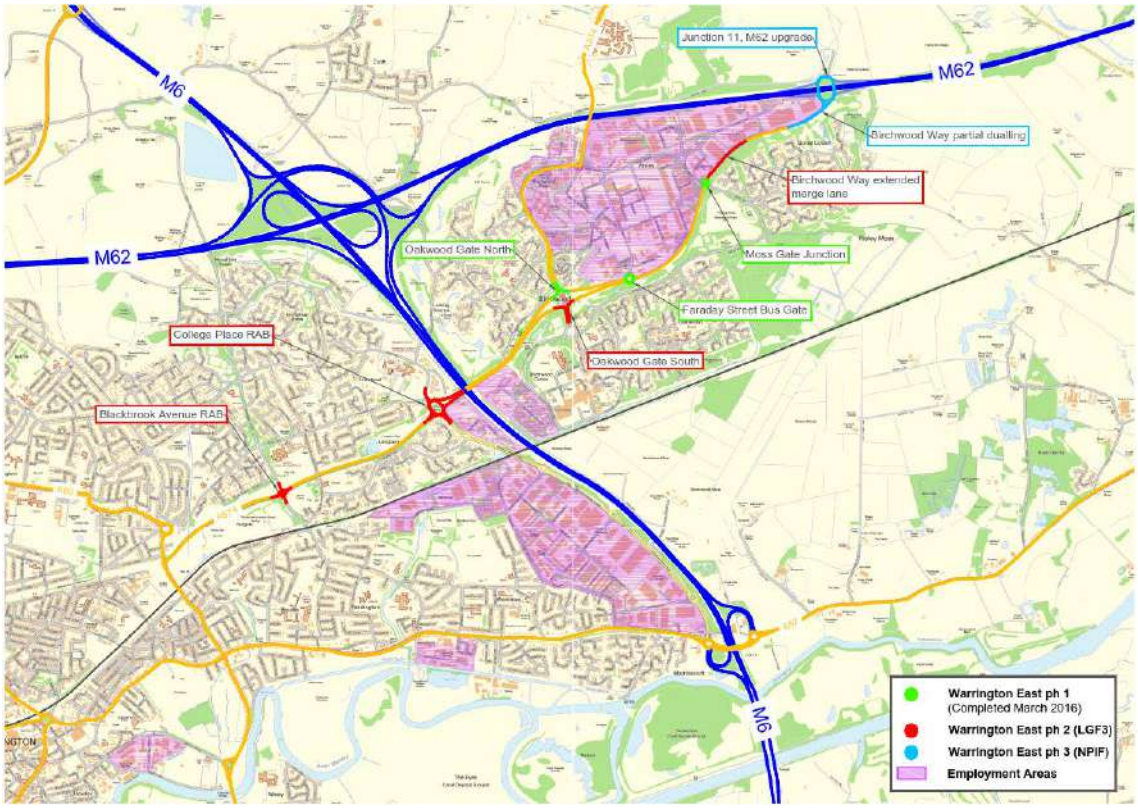
Warrington East Phase 3:

- The project consists improvements to the M62 Junction 11 and the dualling of the A574 Birchwood Way between the M62 Junction 11 and the point where the Phase 2 funded element ends. Specific components include new traffic signals on Junction 11 of the M62 and the partial widening of the A574. The project is expected to improve journey times based on the experience of the Warrington East phase 1

NPIF funding has already been secured for Phase 3 but delivery requirements mean that works must be complete by March 2020. As a result, Phase 3 will be delivered concurrently with the A574 dualling component of Phase 2, as it is more cost effective and practical to deliver both at the same time. To this extent, from a delivery and construction perspective the dualling component of Phase 2 will be built as part of Phase 3, however from a funding perspective, which is the underlying reason for this interim MSBC, funding for the element of A574, Birchwood Way dualling noted in Phase 2 is still sought and as such will continue to be acknowledged as component of Phase 2 throughout this report.

Figure 5 illustrates the locations of what is now a three-phased approach for Warrington East that will be complete by 2021. It also shows the location of key employment sites and their proximity to the corridor highlighting the strategic importance of this route and the need to ensure there is sufficient capacity.

Figure 5: Warrington East transport projects phases 1 to 3



Source: Mott MacDonald

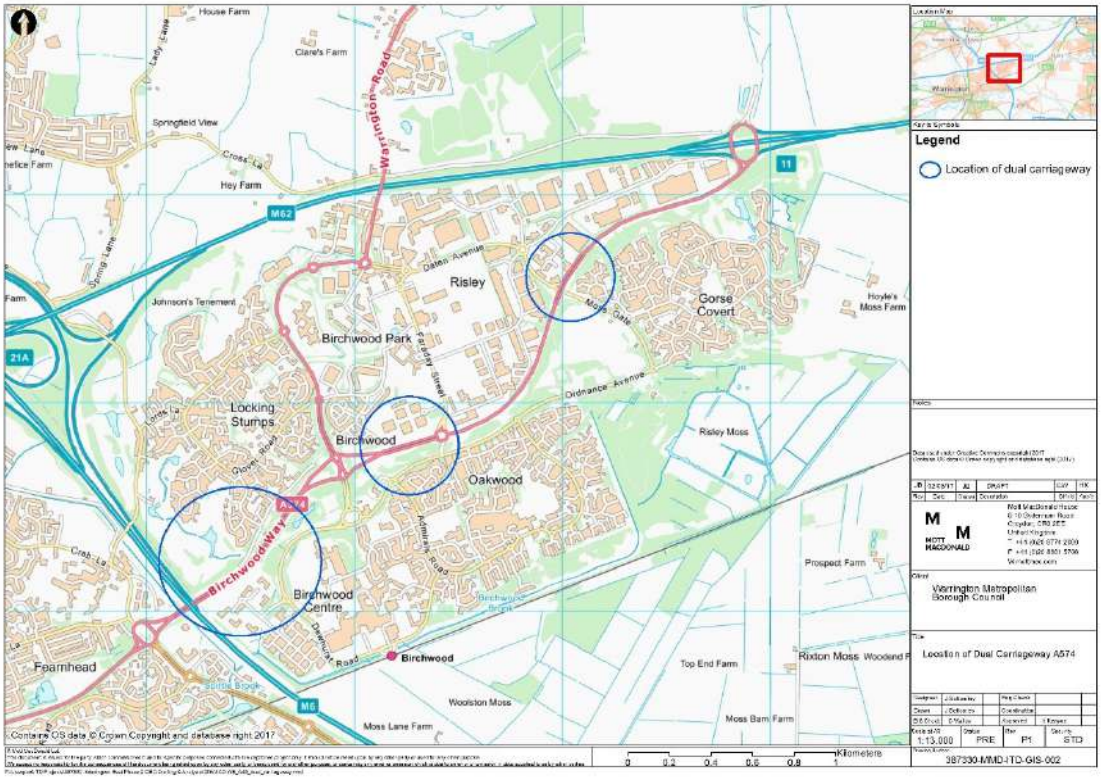
3.4 Warrington Phase 2 scheme detail

Having provided an overview of the strategic context for investment in Warrington East and a brief account of the phased process to deliver congestion relief and capacity improvements to support economic growth, this sub-section provides a more detailed description of Phase 2 works for which partial funding is sought. Detailed drawings of scheme components and technical descriptions of actual works can be found in the Options Appraisal Report (OAR) which is included as Appendix A to this interim MSBC.

3.4.1 Overview of issues

The A574, Birchwood Way is mostly a single carriageway link road with some sections of dual carriageway; these are shown in Figure 6. Large volumes of traffic use the A574 to access Birchwood Park, Birchwood Boulevard and Woolston Grange Employment sites, as well as Warrington town centre.

Figure 6: Location of sections of dual carriageway along the A574



Source: OS Maps & Mott MacDonald

Mott MacDonald was previously commissioned in 2014 by Warrington Borough Council to undertake an interim business case for the Warrington East Phase 2 scheme and found that the A574 Birchwood Way corridor suffers from periodic congestion with frequent queuing and delays and more specifically at the pinch point locations at Oakwood Gate roundabout and College Place roundabout. This vastly constrains highways access to the high value employment sites at Birchwood Park and access to the rest of Warrington. Birchwood Park hosts nationally significant industry sectors including the energy and nuclear industry. The area has been identified as a key growth site within Warrington. However, the traffic issues along the corridor are becoming a burden for workers and employers. and are also adversely impacting growth of this high value employment area[5]. Key problems identified in this initial study are noted in Table 2.

[5] Mickledore- Economic Strategy Warrington East

Table 2: Problems noted along the A574 Birchwood Way corridor

Location	Problem
College Place Roundabout	• Large volumes of traffic pass through the junction, particularly during the AM and PM peak. • In the morning peak, large volumes of traffic make similar movements. There is a constant flow of traffic around the roundabout from Woolston Grange and Birchwood Way. • This results in significant queuing on Crab Lane and subsequently Fearnhead Lane as traffic fails to move round the roundabout. • During the PM peak, queuing is frequently observed for traffic heading from Birchwood Way East to Woolston Grange and Birchwood Way West.
Oakwood Gate/Birchwood Roundabout	• During the evening peak, large volumes of traffic pass through the roundabout, with the majority of traffic heading towards College Place in order to access the M6 or central Warrington. • Congestion problems are frequently observed at College Place
Exit of Moss Gate/A574 dual carriageway	• During phase 1 works, the junction was converted to a signalised junction which has resulted in significant journey time savings and better throughput. • However, the exit heading towards the M62 is only partially dualled (150m). • As a result of the relatively short merge distance, drivers are reluctant to use both lanes and tend to sit in the inside lane, resulting in unnecessary queuing.

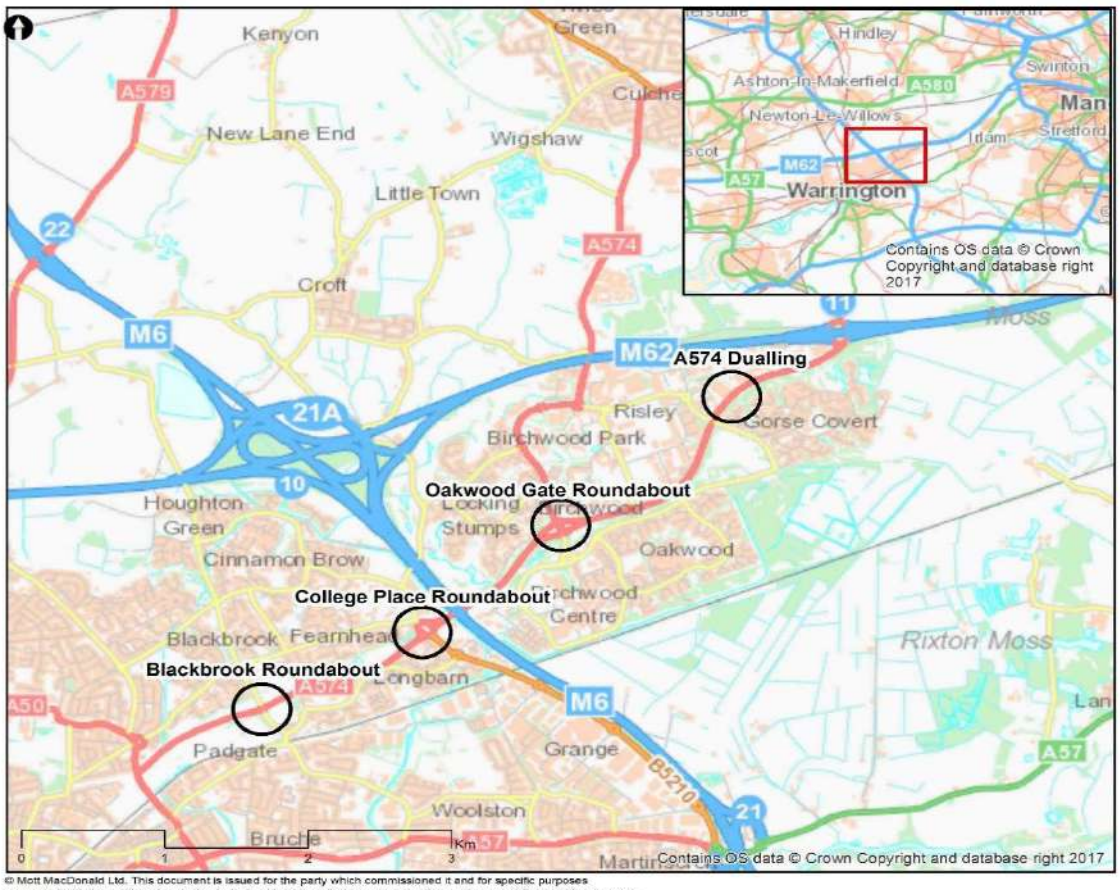
Source: Mott MacDonald

3.4.2 Scheme components

The above findings and a subsequent review of evidence and policy noted in this interim MSBC formed the basis of scheme development for Warrington East Phase 2. Multiple options were developed for each of the identified junctions and to ensure the best and most effective solution was reached for the scheme, a robust and proportionate options appraisal process was undertaken. The OAR addresses this process and its results.

The locations of these junctions are illustrated in Figure 7. Blackbrook Avenue roundabout is also included as capacity improvements to College Place roundabout cause capacity problems at Blackbrook Avenue. However, without College Place improvements no modification of Blackbrook Avenue would be required and so it is not viewed as a scheme component in its own right, rather an integral sub-component of College Place.

Figure 7: Location of Warrington Phase 2 scheme components



Source: Mott MacDonald

The scheme largely focuses on reducing congestion and improving journey times and reliability along the A574 Birchwood Way corridor. The A574 corridor serves as a gateway into Warrington and provides crucial highway access to Birchwood and east Warrington. Highways users approaching from the east access Birchwood and Warrington using A574 from Junction 11 of the M62.

In order to address the congestion issues along the A574 Birchwood Way corridor, funding for the following package of interventions is sought for this Warrington East Phase 2 scheme:

1. Partial signalisation of College Place Roundabout with signals on Birchwood Way on both the eastbound and westbound approaches and on the Woolston Grange Avenue approach. In addition, the westbound approach on Birchwood Way East will be widened to provide a three-lane entry to the roundabout which would provide additional capacity, particularly during the evening peak when there is severe congestion. Modification will also be required to increase capacity at Blackbrook Avenue Roundabout as a result of improvements at College Place.
2. Partial signalisation of the Oakwood Gate/Birchwood Way Roundabout with additional signals provided on the westbound approach of Birchwood Way East and a free flow lane provided from, Oakwood Gate to Birchwood Way West to alleviate the congestion on the southern arm approach.

3. Partial dualling of Birchwood Way north of the Moss Gate signalised junction for several hundred additional metres by building an additional carriageway southbound and converting the existing highway into two north bound lanes.

Together these three measures form a packaged scheme that seeks to better manage traffic flow through and in to Birchwood, and east Warrington and tackle congestion at key pinch points. The scheme seeks to reduce network delay, improve journey time reliability and create a more resilient highways network.

In turn, the modifications to the highways network also support productivity and economic growth at Birchwood Park by facilitating easier and more reliable access to key employment sites for commuters, suppliers and customers, increasing the attractiveness of the area to potential investors.

3.5 Key stakeholders

In the development of the Warrington East Phase 2 scheme both problems and opportunities were identified as part of the evidence review. In order to ensure a robust and proportionate approach addressing for them key stakeholders were identified and a consultation plan was developed by Warrington Borough Council to validate the issues and gain feedback on proposed solutions (interventions). The approach to consultation and the findings are noted with a separate report included as Appendix B to this interim MSBC.

The key stakeholders who were consulted in were:

- Warrington Borough Council Executive Board
- Ward Councillors
- Parish Councils
- Bus operators
- Highways England
- Local businesses
- Commuters working in Birchwood and Woolston
- Residents of Birchwood and Woolston
- Visitors to Birchwood Shopping Centre, Woolston neighbourhood hub, Birchwood tennis centre, local libraries and other key destinations
- Parents of children attending Birchwood and Woolston schools.

4 Policy Review

4.1 Introduction

This section provides an overview of national, regional and local policy and strategy that frame and influence transport investment in Warrington. It also illustrates how the Warrington East Phase 2 supports the priorities set out in policy.

4.2 National policy and strategy

4.2.1 National Planning Policy Framework (NPPF) – March 2012

The National Planning Policy Framework (NPPF) sets out the UK Governments planning policies for England. The document sets out requirements of the planning system and how policy should be adhered to and delivered in local plan development and planning decisions.

The NPPF promotes sustainable development and also addresses the importance of developing sustainable transport solutions to support sustainable development. It advocates:

- A transport system needs to be balanced in favor of sustainable transport modes, giving people a real choice about how they travel.
- Transport solutions which support reductions in greenhouse gas emissions and reduce congestion.
- Developing strategies for the provision of viable infrastructure necessary to support sustainable development, including transport investment necessary to support strategies for the growth of ports, airports or other major generators of travel demand in their areas.

So, what does this mean for Warrington East Phase 2?

Warrington East Phase 2 works would help further sustainable development and align with the NPPF by:

- Reducing congestion and increasing highways network resilience in the east of Warrington.
- Support a reduction in idling behaviour and associated transport emissions.
- Create a safer environment for pedestrians and cyclists on the highways network.
- Support economic growth in east Warrington by ensuring one of Warrington's most important employment sites is safe, easy and quick to travel too.

4.2.2 National Policy Statement for National Networks

This document was prepared by Government in December 2014 to provide guidance for promoters of nationally significant infrastructure projects, such as national road and rail networks that meet the country's long term needs; supporting a prosperous and competitive economy and improving the overall quality of life, as part of a wider transport system. This means developing:

- Networks with the capacity, connectivity and resilience to support national and local economic activity, facilitate growth and create jobs
- Networks which support and improve journey quality, reliability and safety

- Networks which support the delivery of environmental goals and the move to a low carbon economy
- Networks which join up our communities and link effectively to each other

So, what does this mean for Warrington East Phase 2?

Several network pinch points exist in Warrington East. They act as serious constraints to the operation and efficiency of the local highways network, whilst also reducing the attractiveness of investing in new office space and business in this part of Warrington.

Carrying out several modifications to the highways network, specifically (Oakwood Gate/Birchwood Way Roundabout, College Place Roundabout and A574 dualling), would help improve connectivity within this region and the capacity of the existing network. This would principally improve the quality of travel within east Warrington and ensure the area remains an accessible and attractive location for workers to travel to and for new business growth.

4.2.3 The Northern Powerhouse: *One Agenda, One Economy, One North*

In March 2015, The Transport for the North (TfN) Partnership board delivered their vision for the north with a report on the regions transport strategy.

The northern powerhouse aims to rebalance the country's economy and transform the north into a global powerhouse. The transport system has been identified to be a driving force in encouraging economic growth and making the north increasingly attractive for investment. The strategy looks to improve connections between the great northern cities and apply a pan-northern approach to transport. Improvements to transport connectivity, journey times, capacity and resilience and a simplified user experience remain top priorities in the strategy.

So, what does this mean for Warrington East Phase 2?

Within TfN's transport strategy, improving local connectivity features as a key strategy theme. The strategy states that transport projects need to introduce better linkages between people and work, education, training, leisure, recreational and cultural opportunities.

Warrington East Phase 2 seeks to better manage and streamline traffic flow at several pivotal junctions in Birchwood. The modifications would bring about benefits of enhanced connectivity, reduced network delay and an enhanced commuter experience. In tandem, the improvements to the highways network would support ongoing investment in Birchwood Science and Research industries.

East Warrington hosts a number of company headquarters with key knowledge and added value business in nationally supported sectors such as the nuclear industry. Delivering reliable connections to east Warrington would help support the ongoing growth of business in Warrington and further its reputation as one of the most attractive places to work in the North West. The highways scheme would ensure the ongoing growth of key science and research activities in the North of England.

4.2.4 Northern Powerhouse Independent Economic Review (EIR)

In 2015, Transport for the North appointed several partners to undertake an independent economic review of the Northern Powerhouse (NPH. The report noted that over the last 30

years, the North's GVA per capita cap was found to remain approximately at 25% below the average for the rest of England. This has been noted to grow even more since the 2008/9 recession.

Several factors were documented as driving this productivity gap in the north including connectivity and transport. The north has been identified to be fragmented by poor transport links between key settlements. Thus, the economy as a whole is failing to gain the agglomeration effects which would help it grow in productivity.

Transport is therefore identified to play a major role in the norths economic development. Locations with greater transport connectivity are noted to become more attractive for investment and boost local productivity; an efficient transport system can better connect people to employment opportunities and increase the pool of workers available to work in regions and urban centres.

So, what does this mean for Warrington East Phase 2?

The EIR notes that congestion on the highways network is restraining the North's ability to respond to changes in the global market. A slow and incident prone network limits the productivity of logistics and manufacturing sectors.

Warrington East Phase 2 would relieve congestion at key hot spots including Oakwood Gate/Birchwood Way Roundabout and College Place Roundabout. This would help improve access to the strategic network such as the M6 and M62 in the east of Warrington.

Many regional company headquarters have located to east Warrington because of its advantageous and quick connections to the strategic network which enables businesses to attract and draw talent from across the North West. These works will ensure commuters can continue to access employment in one of Warrington's premium employment sites. In turn, this would help encourage further business to locate to east Warrington and fill vacant units in key employment areas.

4.3 Regional policy and strategy

4.3.1 Cheshire and Warrington Strategic Economic Plan and Growth Plan

The initial Strategic Economic Plan was part of a decade long strategy to support growth and economic development, it focused on the three-year period between 2014-2017. The strategy sets out investment proposals for the Local Growth Fund and how this fund will be deployed. This has recently been updated to focus on the period 2017 through to 2020, with a wider long-term vision looking forward as far as 2040.

In this plan, Warrington has been identified as one of the fastest growing employment centres in England. The town is a key node within the Cheshire Science corridor and is home to a number of high-value and knowledge based activities. Birchwood, in east Warrington hosts one of the largest clusters of nuclear research and technology firms in the UK - the National Nuclear Laboratories and AMEC laboratories. The Nuclear and Energy and Environment sectors have been identified as high priorities for continuing job growth and inward investment across the region.

Tackling congestion remains a high priority in helping existing business and new businesses further prosper in Birchwood. The growth plan particularly emphasises the need to provide the

right conditions at Birchwood to help existing science and forensics industry growth. In doing so, it will help to further embed Warrington as a key investment location in the North West and UK.

So, what does this mean for Warrington East Phase 2?

East Warrington is home to significant science based assets that are crucial to the local, regional and national economy. Warrington East Phase 2 should specifically look to target congestion and delays to ensure good connections to the science park. Improving journey times for east Warrington's commuters and business activities will help ensure the ongoing growth of Birchwood Parks research and development capacity. Particularly the parks prospering energy and nuclear business.

East Warrington's close proximity to the M6 and M62 are a key attraction for businesses to locate in this part of Warrington. The Park's intermediate position between Manchester and Liverpool and its proximity to strategic network facilitates commuting from across the whole of the North West. If connections worsen between Birchwood Park and the strategic network, the area could lose its status as a high-quality business location.

Warrington East Phase 2 works would therefore help to maintain the areas reputation as a desirable and advantageous business location. The works will also improve local connections to east Warrington and across the rest of the Borough. This will help further Warrington's reputation as a quality place to live and work.

4.3.2 Atlantic Gateway Partnership Business Plan

The Atlantic Gateway (AG) is a major infrastructure project that aims to attract investment, accelerate growth and rebalance the economy in the northwest of England. The project sees major infrastructure and industry innovation investment, particularly for ports, canals, rail, road, and energy in the Liverpool- Manchester region.

Enhancing connectivity in the AG study area and across the north stands as a key investment target. The delivery of an integrated transport network that incorporates the highways network, railways and Ports at Liverpool, Salford, Warrington and Wirral can help the region capitalise on international trade through the port operations and significantly grow the region's economic output.

So, what does this mean for Warrington East Phase 2?

Warrington has been identified as a strategic location and investment opportunity in the Atlantic Gateway (AG). The towns position relative to Manchester Ship Canal and Warrington Port can be exploited in order to drive international trade and boost the local economy. The AG sees Warrington's Science and Technology assets as key to the regions development, particularly the nuclear research and activities that take place at Birchwood Park in east Warrington.

Warrington East Phase 2 works should continue to support workers, freight and business movements heading in and out of Birchwood Park. Due to the high value commercial activity that takes place at Birchwood, ensuring accessibility to the site from the strategic and local network should be a high priority of the highways scheme.

4.4 Local policy and strategy

4.4.1 Warrington Local Transport Plan 3 (LTP3 2011-2030)

This document sets out Warrington's Transport strategy up to the year 2030. Warrington's has a vision that the town will be recognised as one of the best places to live and work in the UK by 2030 and where residents have an outstanding quality of life. The transport network has been emphasised as playing a crucial role in realising the town's vision

Based on the principles set out in 'Guidance on Local Transport Plans' published by the Department for Transport (DfT) in July 2009, a number of objectives were set to provide a framework for the development of Warrington LTP3 policy and delivery. These objectives look to build and manage a transport network that:

- Is integrated and customer focused and reduces the need to travel by car.
- Enables the regeneration of the Borough and supports economic growth.
- Maintains the highway, minimises congestion for all modes of travel and enables Warrington's 'smart growth'.
- Improves everyone's access to health, employment, education, culture, leisure and the natural environment.
- Improves everyone's access to the town centre by all modes of travel.
- Enhances accessibility for those in disadvantaged communities or groups.
- Improves neighbourhoods and residential areas.
- Improves safety and security for all modes of travel.
- Enhances the image and profile of the place.
- Improves the quality of public space making Warrington more welcoming.
- Protects and enhances the natural environment.
- Reduces the impact of traffic on air quality in Warrington and helps to reduce carbon emissions and tackle climate change.
- Makes Warrington safer, sustainable and healthier.
- Integrates with transport networks outside Warrington to enhance the sustainability of cross boundary travel.

So, what does this mean for Warrington East Phase 2?

Warrington East Phase 2 directly supports Warrington's transport strategy. The modifications to the highway will enable better management of traffic flow into several key junctions in east Warrington. To ensure the scheme can benefit Warrington to its best ability and align with the transport strategy, Phase 2 works should aim to:

- Reduce congestion at several pinch points in east Warrington
- Facilitate better access to Birchwood Park by reducing delays on the approach to the business park
- Improve connectivity for public transport, pedestrians and cyclists
- Reduce delays across Warrington's highways network to ensure higher productivity in and around east Warrington
- Reduce queues, vehicular idling and vehicular greenhouse gas emissions

4.4.2 Warrington Local Plan Core Strategy 2014 – 2027

The Local Plan Core Strategy is Warrington's borough-wide strategic planning document and it defines the main challenge for Warrington as the need to establish a new identity, which values its origins as a market town and gateway in the region and which reinvigorates a sense of place and pride in the town.

Within the Local Plan, Policy CS2, *Quantity and distribution for development* gives reference to continuing Birchwood Park as a main focus for business within Warrington and it provides a vision for what East Warrington will be like in 2027.

The plan seeks Birchwood Park to remain as a primary location in the borough and have the highest standards of design and landscaping to provide an attractive business environment. It is envisaged that Birchwood Park will remain accessible by a variety of different modes.

So, what does this mean for Warrington East Phase 2?

East Warrington has a pivotal position in Warrington's future plans for prosperity and development. Birchwood Park has been identified as an important employment growth site. Warrington East Phase 2 works can help deliver better connection and travel times to and from Birchwood Park. Particularly, addressing AM and PM peak delays at a number of junctions (College Place Roundabout and Oakwood Gate/Birchwood Way roundabout) and ensuring traffic can meet the M6 and M56 in a timely manner.

Effective transport connections between Birchwood Park and the strategic network will help the area capitalise on further developments and maintain the areas reputation as a desirable and high-end business location.

4.4.3 Warrington Means Business 2017

'Warrington Means Business 2017' is Warrington's economic growth and regeneration programme, produced jointly by Warrington Borough Council and Warrington and Co, a public-private partnership comprising the key agencies who will shape Warrington's economic future.

A strong component of the development strategy is delivering prime business locations within the Borough and the North West. Birchwood Park and Woolston Grange in Warrington East are specifically identified for employment growth.

So, what does this mean for Warrington East Phase 2?

The recently refreshed 'Warrington Means Business' document shows the extensive aspirations that both the public and the private sector have for the redevelopment across the Borough. Phase 2 Warrington works can help support the ongoing development taking place in east Warrington by ensuring a well-functioning highways network and the necessary infrastructure that will help increase productivity across the Borough.

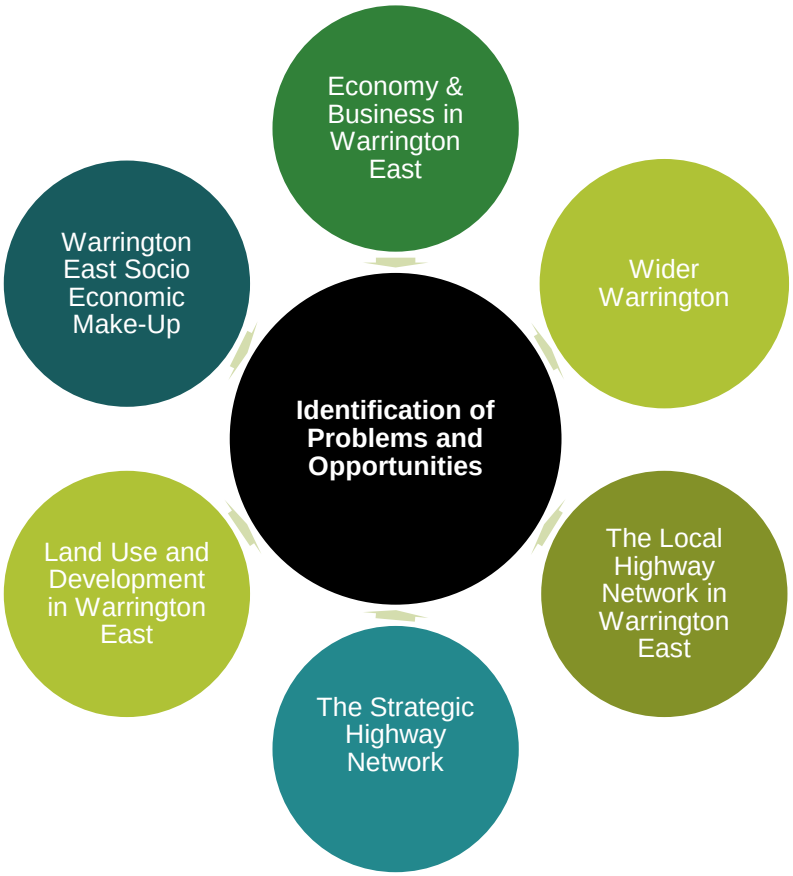
Furthermore, improvements to pedestrian and cycle crossings would help encourage amiable conditions for sustainable travel alongside the highways network. This would help support the rejuvenation of east Warrington's physical environment and image as a friendly and hospitable place to walk and cycle.

5 Approach to Identifying Problems and Opportunities in Warrington East

This section provides a brief overview of our approach to establishing the problems and opportunities in the study area. This forms a crucial stage of the interim MSBC development and enables the process of evidence based objective setting for the Warrington East Phase 2 scheme.

Six assessment themes were identified to capture the key problems and opportunities in Warrington and specifically Warrington East. The themes are illustrated in the schematic below:

Figure 8: Assessment themes



This thematic approach facilitated the identification of the major problems facing east Warrington that the scheme needs to address. A thematic approach was selected to be able to identify where problems:

- Existed in isolation;
- Where they cross cut across multiple themes; or
- One thematic problem intensified or compounded another thematic problem.

In the following six sections, a robust evidence base of problems and opportunities is identified, together with their relevance and impact in terms of the Warrington East Phase 2 scheme. Each section is set out according to the following structure:

1. A detailed review of the main issues according to the theme
2. A summary of the key problems and opportunities
3. Relevance of the key problems and opportunities to the Warrington East Phase 2 scheme

The headline problems and opportunities identified for each theme are summarised collectively in tables in Section 13.

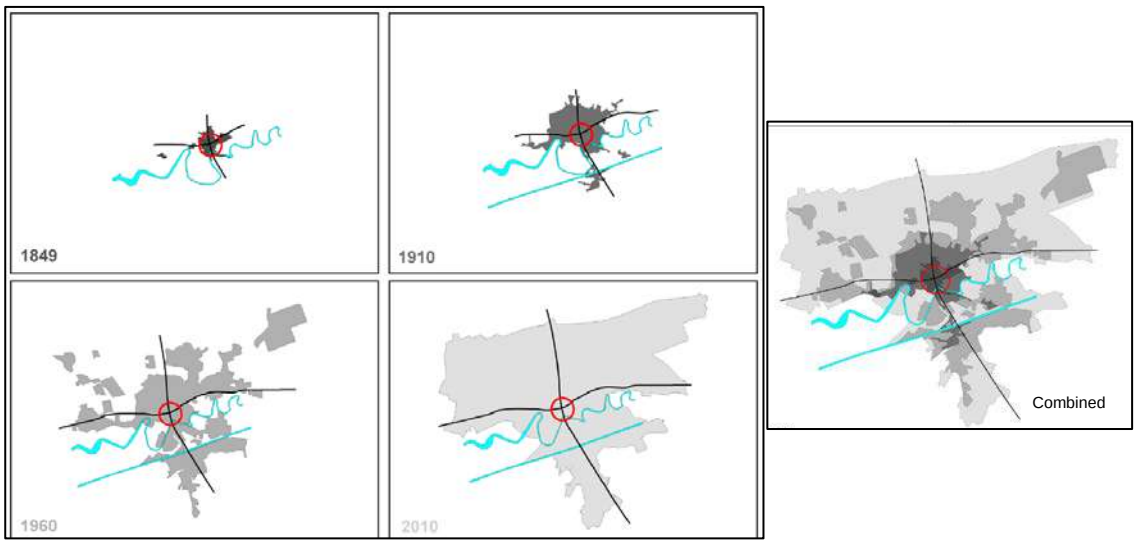
6 An Overview of Warrington

Although the focus of this interim MSBC is Warrington East, it is pragmatic to provide an overview of the entire town of Warrington and how the key issues that Phase 2 seeks to address in east Warrington can impact the town as a whole, thus setting the strategic importance for investment in a wider geographic context.

6.1 Geographic growth in Warrington

Warrington is one of the most economically successful towns in the UK today. Warrington's rapid growth is underpinned by its location in between Manchester and Liverpool, at the heart of the Northern Powerhouse, its excellent strategic connectivity, the entrepreneurial character of its people and its businesses, its attractiveness to investors and its cultural offer. From being designated as a New Town[6] in 1968, Warrington has grown from a small town of around 70,000 people to the small city it is today, with a population of over 207,000 people[7]. This evolution of the town is also illustrated in Figure 9.

Figure 9: Warrington's growth from town to city



Source: Warringtons Local Plan Core Strategy (Warrington Borough Council, 2014)

[6] The 1946 New Towns Act established an ambitious programme for building new towns to aid the post-war reconstruction of Britain's towns and communities.

[7] ONS – Population estimates 2016

So, what does this mean for Warrington East Phase 2?

The largest part of the new town development in 1968 was Birchwood, in east Warrington and the area has seen sustained commercial and residential development over the last 50 years. It has played a pivotal role in driving the economy of Warrington as a whole and building the business-friendly reputation which the town now boasts. Unaddressed capacity issues on the highway network along the A574 in east Warrington adversely affecting the movement of people and goods will impede further growth in Warrington as a whole.

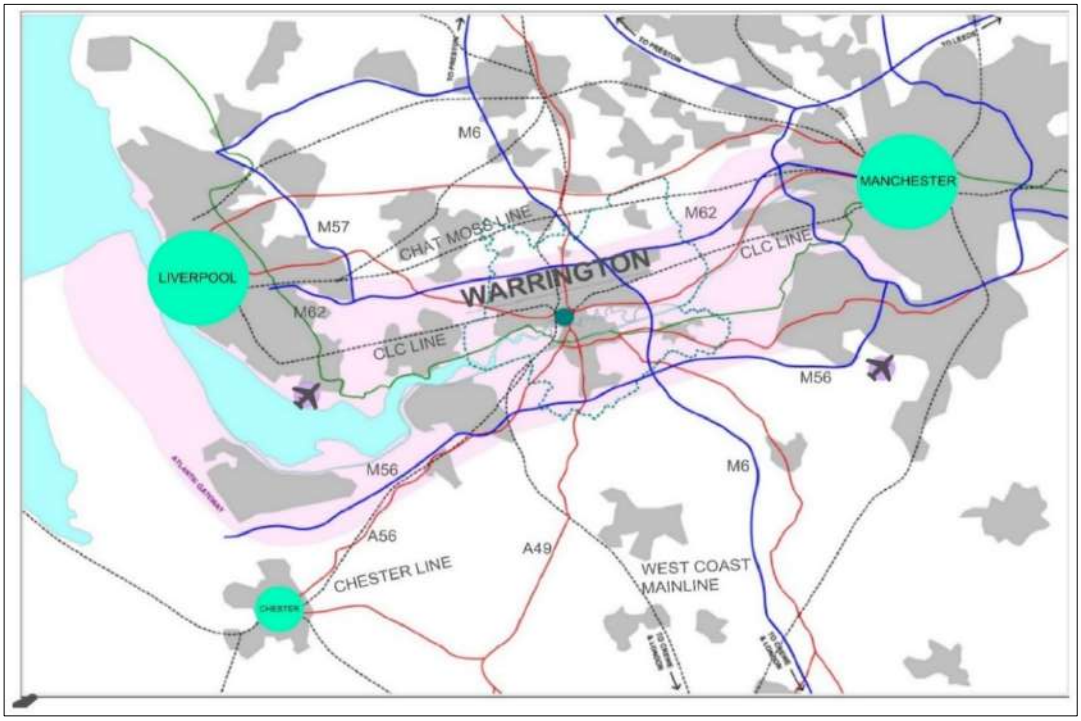
6.2 Strategic connectivity

This section looks at Warrington's overall multi modal strategic connectivity and how failure to address congestion and capacity issues in east Warrington could affect Warrington as a whole.

6.2.1 Highway connectivity

Warrington is well connected to the Strategic Highway Network, with the M62 to the north of the town, the M6 to the east, and the M56 to the south as shown in Figure 10. Warrington is nestled in this motorway 'box' and the access from the town centre to any of these three routes is less than 5 miles. Other than Manchester, Warrington is the only location in the North of England that benefits from strategic motorway access from three directions. The new Mersey Gateway Bridge over the River Mersey in Halton will further strengthen Warrington's strategic connectivity 'box', enhancing the resilience of the network. Junction 11 on the M62 is dedicated to serving inbound and outbound movements from Birchwood and east Warrington and provides unrivalled connectivity to the surrounding motorway 'box' and wider strategic motorway network.

Figure 10: Warrington's strategic transport connections



Source: Warrington Local Plan Core Strategy (Warrington Borough Council, 2014)

So, what does this mean for Warrington East Phase 2?

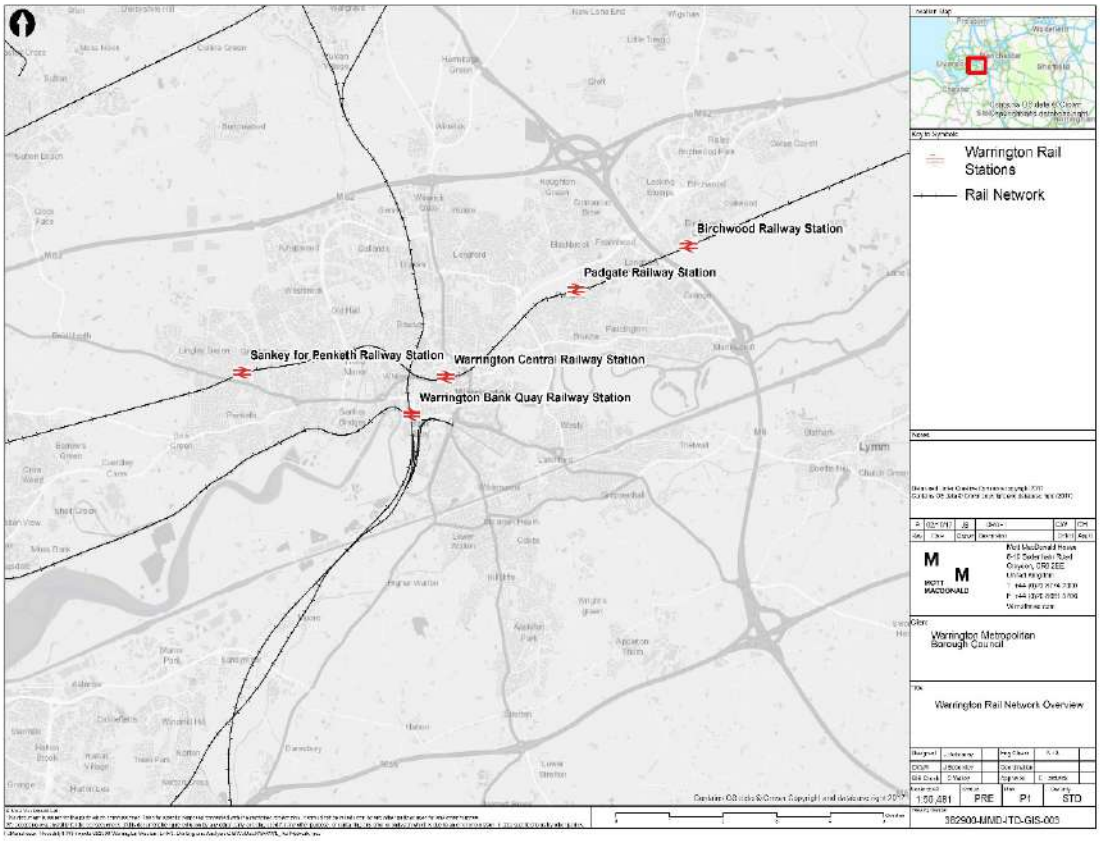
Good highway connectivity between Warrington and the wider network means much of the traffic passing through east Warrington is either coming from or going to the M62 via the A574 and as well as heading for key employment sites in Birchwood and Woolston Grange. This is creating issues for both commuters and local residents who are faced with congestion and delay.

Unaddressed capacity issues in east Warrington will result in Warrington being viewed as a less attractive place to live and work and reduce its ability to capitalise on its strategic highway connectivity which is needed to support the continued growth of Warrington as a whole.

6.2.2 Rail connectivity

Warrington is served by five rail stations, as shown in Figure 11. Warrington Bank Quay station, located on the West Coast Main Line (WCML), provides services to and from London with travel times of less than two hours, making the area highly accessible from further afield by train as well as road.

Figure 11: Warrington's rail network



Source: Mott MacDonald

Additionally, Warrington Bank Quay station lies on the intersection of prospective HS2 and Northern Powerhouse Rail (NPR) services. Initial work on Northern Powerhouse Rail (NPR) references Warrington Bank Quay as a potential stop on the new high-speed route and the station is to be upgraded to be served by HS2 trains, further reducing travel times to London and potentially across the country.

Warrington is also served by the Cheshire Lines Committee (CLC) Line between the two key Northern Powerhouses of Liverpool and Manchester, both Semi- fast services and local stopping services run on this line. Semi-fast services run between two appointed stations, stopping only at key stations en-route, whereas local stopping services stop at a greater number of stations with shorter distances between stops. On the CLC Line semi-fast services between Manchester and Liverpool call at Warrington Central and Birchwood whilst Sankey for Penketh and Padgate are served by local stopping services.

A sixth station at Warrington West (between Sankey for Penketh and Warrington Central) is planned for delivery in the next two years[8]. Warrington has the potential to be transformed into a high-speed rail hub where HS2 and Northern Powerhouse Rail meet.

6.2.3 Freight

Two significant waterways pass through the main urban area of Warrington; the River Mersey, which passes close to the Town Centre and, further south, the Manchester Ship Canal. These waterways have traditionally been a defining part of the town's character. Freight services use the Manchester Ship Canal to reach other inland freight distribution centres such as Port Salford.

So, what does this mean for Warrington East Phase 2?

Waterborne freight requires efficient highway connectivity for ‘last mile’ delivery of goods to distribution and manufacturing centres. A large proportion of Warrington’s distribution and manufacturing centres are located within east Warrington, emphasising the importance of an efficient and reliable highways network in the area.

Similarly, efficient and reliable access to the strategic highway network that connects Warrington and specifically Warrington East, to both Manchester and Liverpool airports is key for airborne distribution of freight.

Unaddressed capacity and congestion issues along the A574 in east Warrington impede the efficient movement of goods and have the potential to deter further investment in the manufacturing and distribution sector, which is key to the wider Warrington economy.

Warrington also sits equidistant between two international airports; Liverpool international airport is to the west and Manchester International airport is located east of Warrington so the town enjoys both close proximity and choice of two international airports for distribution of airborne freight.

6.3 Warrington’s aspirations for growth

As noted in Section 6.2 east Warrington has excellent strategic connections with the highways network, rail network and waterways; as such there is great potential for the area to prosper.

[8] Warrington Borough Council

Although not specific to east Warrington, Figure 12 highlights some of the key growth corridors that Warrington, as a whole and by default, east Warrington can benefit from as a result of its strategic location if capacity and journey time reliability on the highways network is improved.

Figure 12: Warrington is at the intersection of multiple nationally significant growth corridors

Source: Warrington Means Business (Warrington Borough Council and Warrington & Co, 2017)

The next sub sections provide an overview of these growth opportunities in further detail and considers their relationship with the proposed Warrington East Phase 2 Scheme.

6.3.1 The Northern Powerhouse

Warrington is located centrally between Liverpool and Manchester, two of the largest cities within an interconnected North. As such, it is a significant 'City' within the Northern Powerhouse concept.

The completion of the Mersey Gateway bridge and associated link roads provides Warrington with a complete strategic highway 'box', enhancing network resilience and reinforcing its connectivity.

The northern transport strategy emphasises the need for its transport network to support its four prime Northern Powerhouse (NPH) capabilities:

- Advanced manufacturing - with a particular focus on materials and processes
- Energy - in particular, expertise around generation, storage and low carbon technologies and processes, and especially in nuclear and offshore wind
- Health innovation - with a focus on life sciences, medical technologies and devices
- Digital technology - focusing in particular on computation, software tools/design and content, data analytics, simulation/modelling, and wider strengths in media

Specifically, the strategy seeks better transport connectivity in order to tackle poor supply chain linkages and raise employment rates, whilst also making the region more attractive to global businesses. It aims to:

- Reduce road congestion

- Increase network capacity and resilience for freight, with particular emphasis on rail and water but also addressing road pinch points
- Support growth in traffic through northern ports by improving their connectivity and enabling shipping lines to offer more cost-effective services
- Improve air quality, improve rail freight movement and address poor inter-modal freight transfer

So, what does this mean for Warrington East Phase 2?

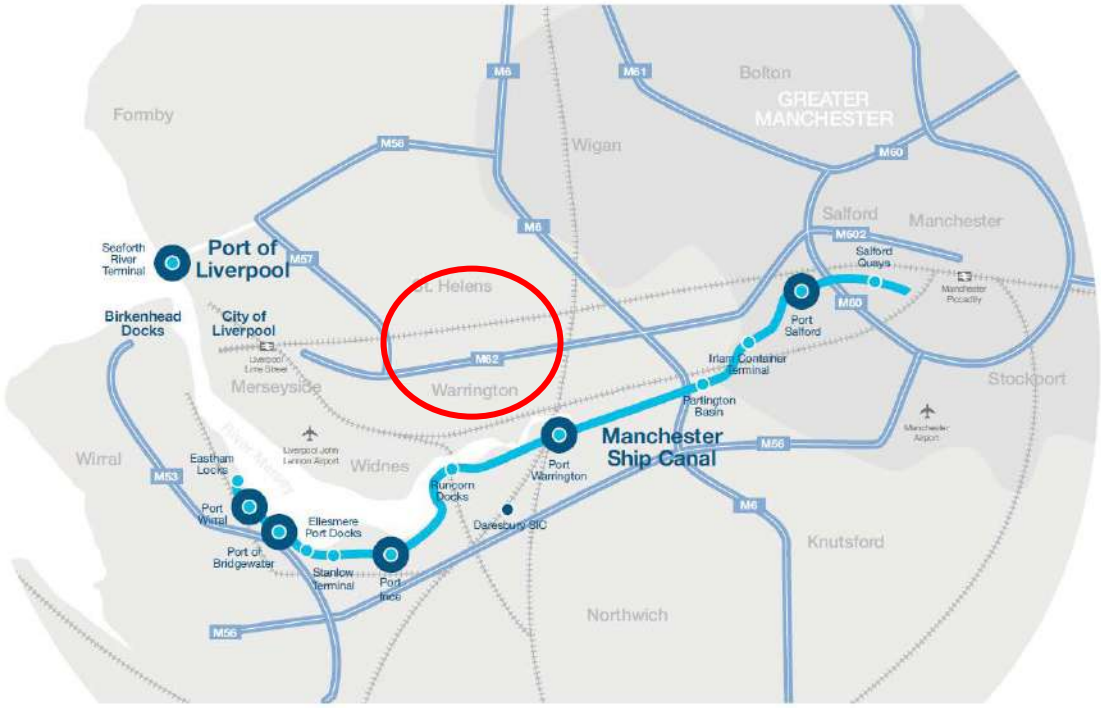
Warrington East Phase 2 presents an opportunity to reduce congestion at a major gateway into Warrington and its thriving businesses. A number of commercial assets crucial to the NPH are situated at Birchwood Park; the largest cluster of nuclear research and technology firms in the UK are based at the enterprise zone. A number of headquarters and business activities relating to energy, forensics, telecoms and software are also located at Birchwood in east Warring 15 cm ton.

Removing key network pinch points along Birchwood Way could reduce congestion and delays along the corridor. Thereby raising accessibility to this crucial employment area within Warrington. This would help embed the town as a crucial component of the NPH concept, support some of the North's prime capabilities and help attract more investment in to this thriving growth zone. Overall, this could help drive economic growth and generate a number of multiplier effects for the town

6.3.2 The Atlantic Gateway

The Atlantic Gateway is an emerging hub for world trade, logistics, business and innovation in the corridor stretching from Deeside and Merseyside through Cheshire and Warrington to Manchester (Figure 13). The Gateway region is a leader in innovation and advanced manufacturing and delivers a GVA of £17 billion per annum. The area represents a key intervention priority for the Cheshire & Warrington LEP, Liverpool City Region LEP and Greater Manchester LEP, offering significant prospects for the long-term economic prosperity of the region. By 2030, there is the potential for some 250,000 new jobs to be created in the Atlantic Gateway area and around 140,000 of these jobs will be associated with Atlantic Gateway priority projects, involving £14 billion of new investment (Atlantic Gateway Business Plan, 2012).

Figure 13: Warrington is located at the centre of the Atlantic Gateway initiative, supported by the Cheshire & Warrington LEP, Liverpool City Region LEP and Greater Manchester LEP



Source: Atlantic Gateway Business Plan (2012)

So, what does this mean for Warrington East Phase 2?

The development in east Warrington will provide the area with the infrastructure capable of coping adequately with the additional traffic which will be presented as a result of the economic opportunities offered by the Atlantic Gateway concept. The scheme will remove a number of key pinch points that cause delay along the Birchwood Way corridor, effectively preventing the exacerbation of current congestion issues in the area and supporting the continued growth of east Warrington and the overarching Northern Powerhouse of Warrington.

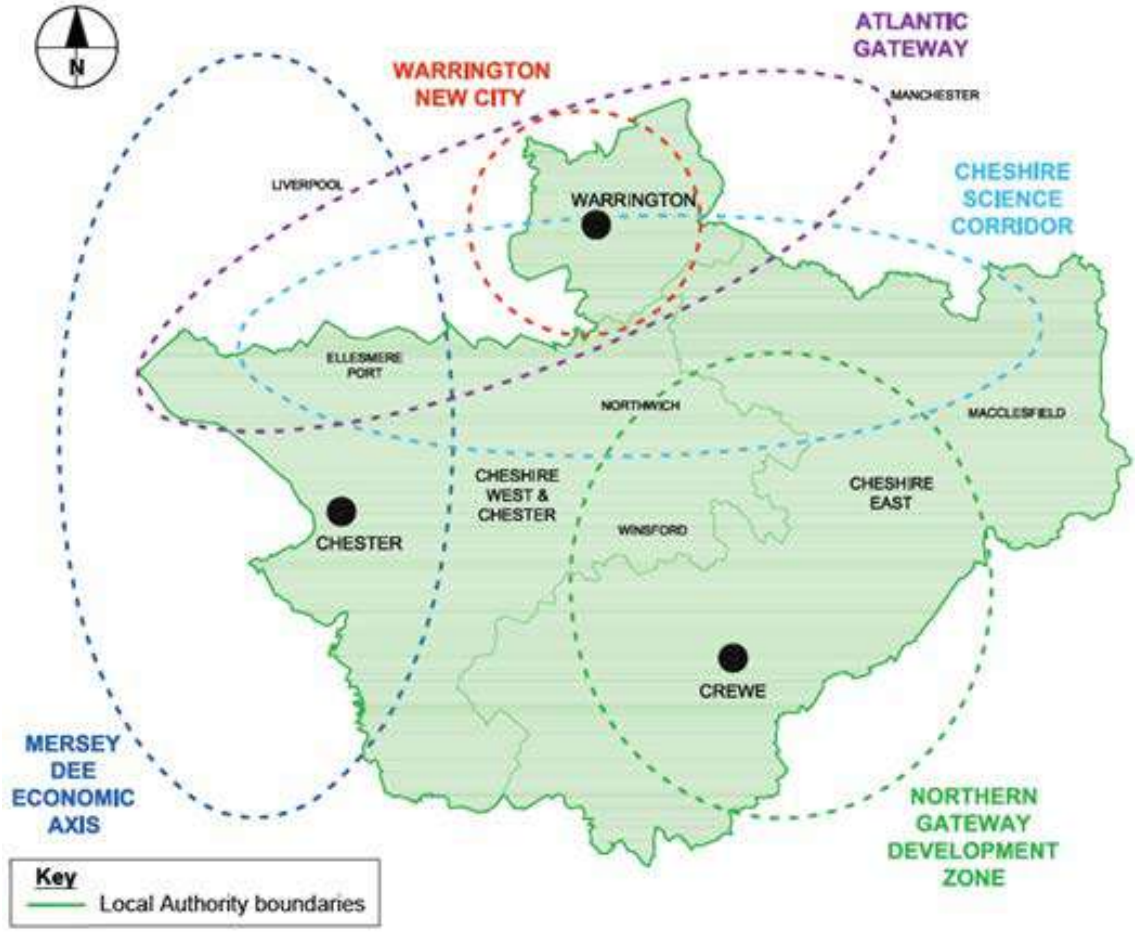
6.3.3 The M6 growth corridor

Warrington is strategically positioned along the South-East England – North West England – Scotland corridor, supported by two of country's busiest transport routes; the M6 motorway and West Coast Main Line (WCML), which is to be upgraded to be served by HS2 trains. The WCML runs through central Warrington with a station at Warrington Bank Quay, approximately 5 miles from key employment sites within east Warrington.

Connectivity along this corridor is set to improve dramatically as a result of HS2, as well as other major investment programmes such as the roll-out of Smart Motorway Technology on the M6 [9], providing beneficial opportunities which east Warrington is well positioned to capitalise upon.

[9] Cheshire and Warrington LEP – Strategic and Economic Plan for Cheshire and Warrington

Figure 14: Key development and gateway areas located in proximity to Warrington



Source: Mott MacDonald

So, what does this mean for Warrington East Phase 2?

Warrington lies at the heart of the M6 growth corridor. East Warrington has the potential to capitalise on the introduction of smart motorways and rail upgrades in the Borough. However, there is a risk that the A574 corridor could become prone to further congestion, delays and incidents. This would prevent east Warrington reaping the full benefits of the infrastructure improvements included in the M6 growth corridor.

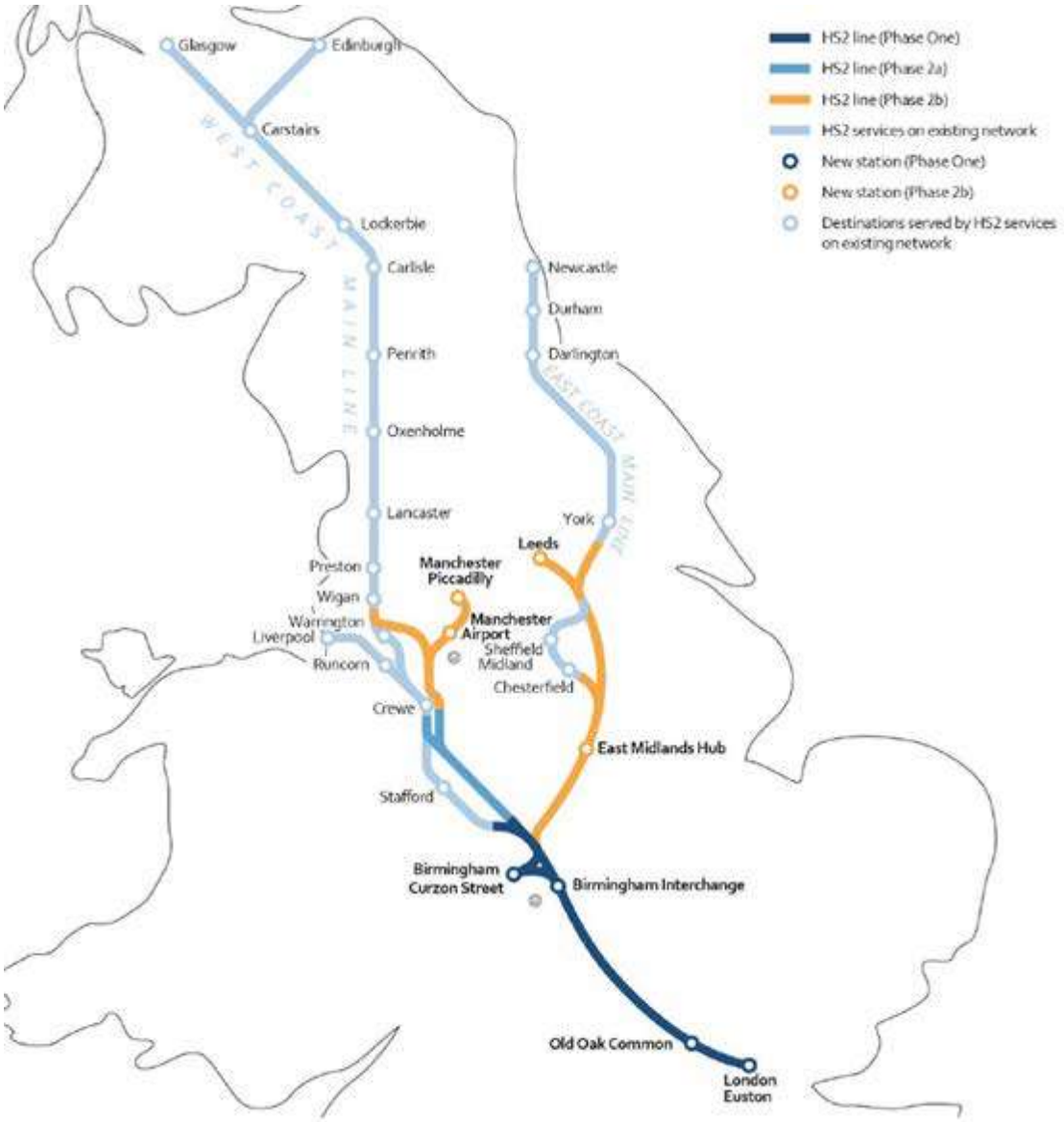
Warrington East Phase 2 forms a crucial step in enabling east Warrington to access the benefits of the M6 growth corridor. The works would maintain the quick and advantageous connections that Birchwood possesses with the wider strategic network and would prevent further highways degradation. This in turn could help attract investment at the Business park and help embed Birchwood and east Warrington as a destination for science, research and logistics excellence in the UK.

6.3.4 HS2

High Speed Rail 2 (HS2) is set to transform the UK's rail network. The high-speed service presents the opportunity to offer greater connectivity across the country, cut journey times,

foster economic development and release existing rail capacity on overcrowded lines. A map of the intended HS2 network is shown below.

Figure 15: HS2 network, Warrington is scheduled for HS2 services on the existing network



Source: High Speed Two Phase Two Strategic Case 2017

The main high-speed rail services could run out of an enhanced Warrington Bank Quay rail hub, located directly in the town centre[10] and Warrington has been identified as one of the locations which will benefit from long distance journey time savings.

[10] Warrington Means Business – City Centre Masterplan 2017

So, what does this mean for Warrington East Phase 2?

HS2 has been identified to deliver a number of benefits for Warrington: rail journey times savings; enhanced connectivity to other northern cities; and a release of extra rail capacity on the WCML. The enhanced rail services in Warrington will likely bring new investment into the region, with new employment and housing sites developed across the district.

A fully functioning and operational highways network will be required to support local and regional movements to the rail network and to the associated development sites. Birchwood Way forms a primary gateway into Warrington, with traffic being able to pass between the town and wider strategic network. Phase 2 works seeks to cut congestion and streamline travel along the corridor. Therefore, the scheme can help support highways access into Warrington, local movements and access to the towns future enhanced rail services.

6.3.5 Airports

Warrington is located within close proximity to two international airports. Liverpool John Lennon airport sits 14 miles to the west and Manchester airport lies approximately 16 miles to the east.

Manchester is the primary international gateway in the North and Manchester Airport Group further plans to grow its annual passengers up to 50 million by 2030. This could deliver an extra 60,000 wider jobs in the region [11]. Thereby a prime opportunity for residents in Warrington to prosper from the emerging employment opportunities.

The Liverpool John Lennon Airport Masterplan also plans to boost the performance and productivity of the airport. With the prospect of enhanced logistics services associated with the growth of the Port of Liverpool and greater cargo development at the airport, the airport could generate £61m GVA per annum across Liverpool City Region by 2050[12]. Along with £625m GVA per annum relating to passenger impacts, and a further £270m additional GVA per annum relating to commercial development impacts up to 2050.

So, what does this mean for Warrington East Phase 2?

Birchwood Way connects with the M62 J11 to the east. The highway also connects to Woolston Grange avenue to the west and provides onward connection further south to M6 J21. Highways traffic originating in east Warrington can use Birchwood Way to access the strategic network and connect to both Liverpool and Manchester international airports.

Addressing key pinch points along the Birchwood Way corridor will help reduce congestion and delay to the wider strategic network. This has the potential to improve access to international markets.

[11] TfGM 2040 Transport Strategy

[12] Liverpool John Lennon Airport Master Plan to 2050

Issues

- East Warrington has played a pivotal role in the rapid growth of Warrington since 1968 leading to unaddressed capacity issues along the A574, impeding further growth.
- Warrington has excellent strategic connections however the growing congestion issue has resulted in Warrington being viewed as a less attractive place, reducing its ability to capitalise on its strategic highway connectivity.
- Despite Warrington being embedded within an excellent rail network, the delays associated with the onwards journey reduces its attractiveness.
- Warrington is unable to fully capitalise upon its freight links due to inefficient highway connectivity for the 'last mile' delivery of goods to distribution and manufacturing centres.
- Warrington is a significant town within the Northern Powerhouse concept but is currently unable to provide the necessary transport connectivity in order to tackle poor supply chain linkages and raise employment rates.
- East Warrington is unable to capitalise on the benefits of the improvements to the M6 growth corridor as it's connecting network already exceeds capacity.

Opportunities

- Warrington is advantageously positioned in terms of access to both Liverpool and Manchester Airport. Improved connectivity between Warrington and both Airports has the potential to open the town to investment from international markets.
- Warrington Bank Quay sits on the prospective HS2 and NPH lines. Effective ongoing connectivity to the highways network will allow Warrington to become an economic hub within the rail network bringing numerous economic opportunities to the town.
- Warrington East Phase 2 could provide the area with the infrastructure capable of coping adequately with the additional traffic which will be presented as a result of the economic opportunities offered by the Atlantic Gateway concept.
- Warrington East Phase 2 presents an opportunity to reduce congestion at a major gateway into Warrington and its thriving businesses, allowing the areas to seize the opportunities presented as a result of the growing Northern Powerhouse Concept.
- Improvements to the local highways network in east Warrington will enable the area to access to the benefits of the M6 Growth Corridor including the prevention of highways degradation.

7 Socio-economic Overview

Having provided an overview of the borough of Warrington as a whole for strategic context, the following six sections (7-12 inclusive) are focused solely on east Warrington.

The purpose of this chapter is to provide an overview of the socio economic trends in east Warrington. Primarily this will identify problems and opportunities in reagrd to east Warringtons population and employment levels. In assessing pertinent socio-economic trends, this Section has relied on data sources from the Office of National Statistics and NOMIS.

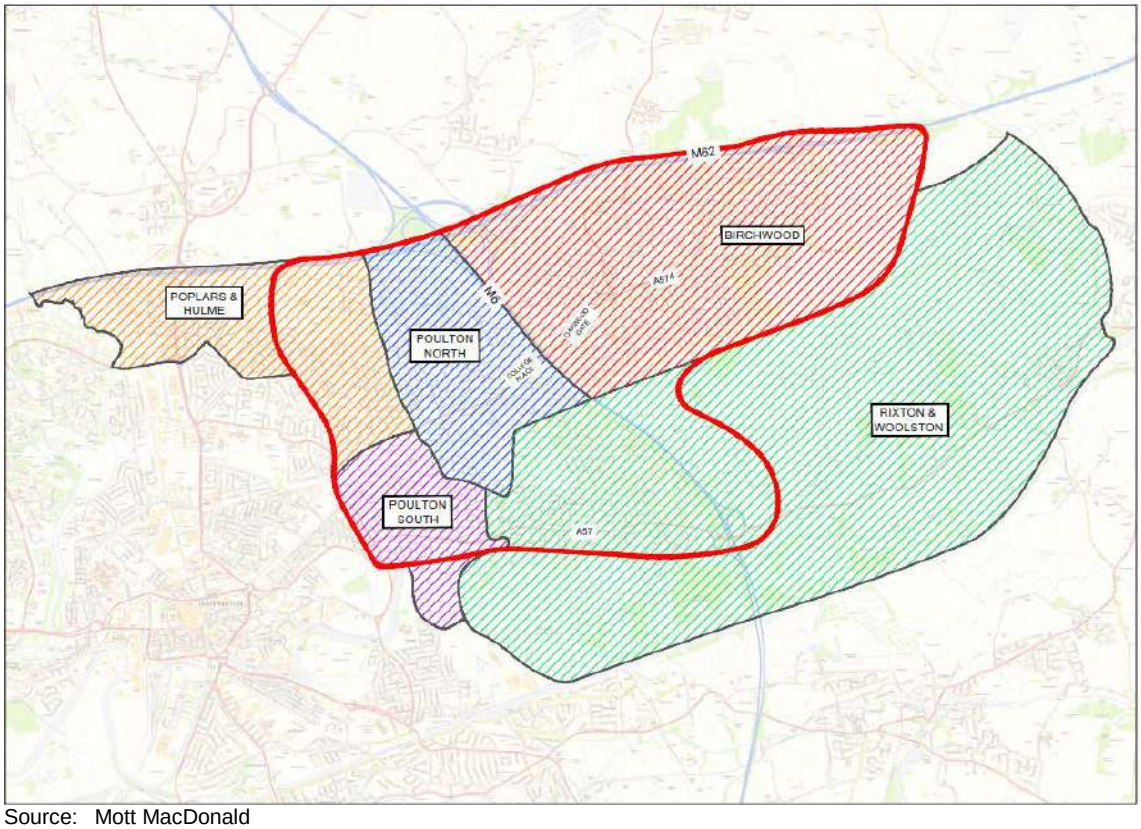
In order to enable an accurate assesssment of the socio-economic situation within east Warrington alone, data was analysed at LSOA (Lower Super Output Area) level. Lower Super Output Areas are contiguous geographic areas with a minimum population of 1000 and a mean population of 1500 This approach allowed the socio-economic situation within the pre-determined boundaries of east Warrington (as shown in Figure 16) to be analysed in detail, by the amalgamation of the LSOA's within the study area.

7.1 Location

Warrington East Phase 2 is located to the east of the town of Warrington. For the purposes of this overview east Warrington is defined as the area east of the A50 stretching as far as Risley Moss and bounded in the South by Manchester Road and in the North by the M62.

East Warrington is framed by the M62 to the north and the M6 to the west and they provide advantageous conections to the north and the south of England, as well as connectivity to Merseyside, west of the study area and Greater Manchester to the east. These connections to the strategic highways enable the town to benefit from good connections to the surrounding conturbations and further afield.

Figure 16: Geographic coverage of east Warrington



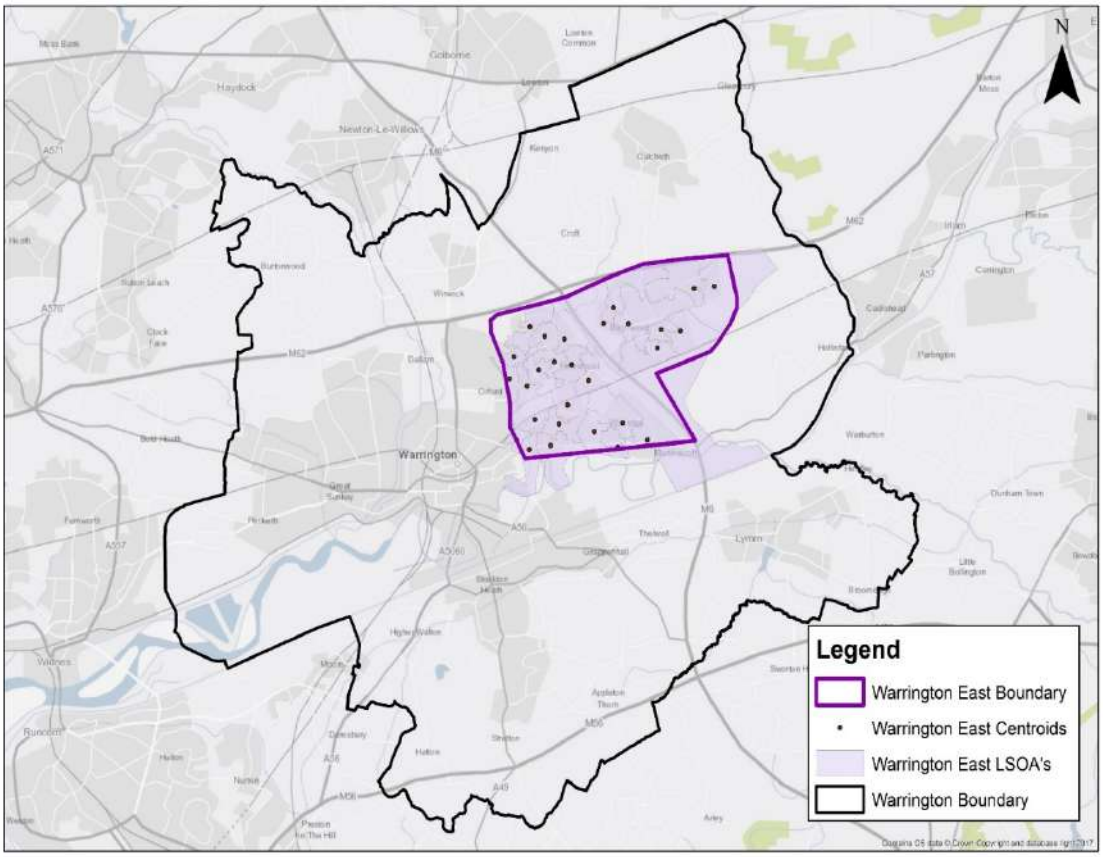
Source: Mott MacDonald

7.2 East Warrington's population

Warrington was given new town status in 1968 and has since grown in size rapidly with east Warrington following suit. East Warringtons population can be seen in Table 3 and is compared with the population of the town of Warrington and England as a whole.

In order to calculate the total populaion of east Warrington GIS (Geographical Information System) was used to amalgamate all LSOA's which are included within the pre defined scope of the area. LSOA's were considered to be included within east Warrington when their centre was completely within the boundary line of the study area. The centre of the LSOA is caculated based on the distribution of people within the LSOA rather than just area centre, making the population estimates presented for east Warrington extremely accurate. The data used to calculate east Warrington's population was taken from 2016 mid year population estimates from ONS (Office for National Statistics). Figure 17 ilustrates the area included within the evidence analysis within the context of Warrington as whole, dislaying the included LSOA's.

Figure 17: LSOA's included within east Warrington



Source: ONS 2016 Mid-year population

Table 3 displays the population of East Warrington, the total population of Warrington as a whole, the North West and Great Britain. East Warrington's population represents 20% of Waringtons total population at 40,850 people, a significant proportion of the population considering the areas relative size compared to the size of Warrington as a whole.

Table 3: 2016 Mid-year population estimates

Area	2016 Mid-year population
East Warrington	40,850
Warrington	208,809
North West	7,219,623
Great Britain	63,785,917

Source: ONS Mid-year population estimates

Population growth projections were unavailale at the level required for east Warrington in isolation. For Warrington as a whole, the population is estimated to grow by 213,000 by 2020 and continue to grow through to 2040 (Table 4) (Figure 18).

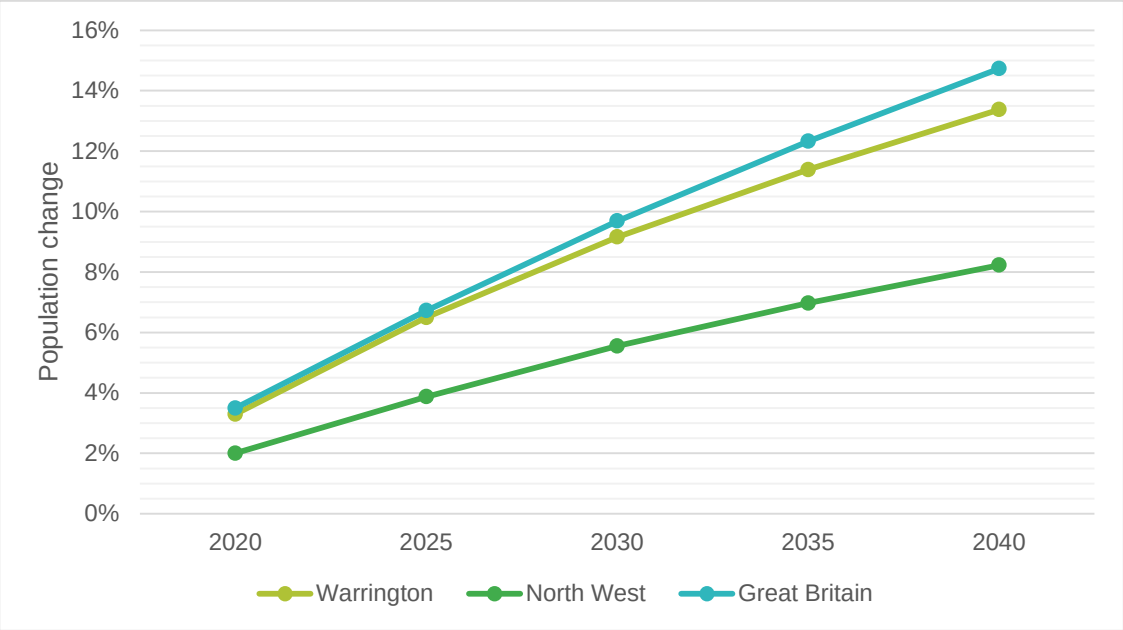
This is a similar rate to the Great Britain average and faster than the North West average. Therefore, it is essential that Warrington's transport system, which includes the network in east Warrington, is able to accomodate a larger number of residents and a greater demand to travel within, in and out of the Borough.

Table 4: 2014 Based population projection (% change)

Area	2020	2025	2030	2035	2040	Average Annual growth
Warrington	3.29%	6.49%	9.16%	11.39%	13.37%	0.51%
North West	2.00%	3.87%	5.55%	6.97%	8.23%	0.32%
Great Britain	3.49%	6.72%	9.69%	12.32%	14.73%	0.57%

Source: ONS

Figure 18: 2014 based population projection (% change)



Source: ONS

Issues

- The population of Warrington on the whole has grown over the past 15 years and is projected to continue growing through to 2040; east Warrington represents a significant proportion of this. The town will be home to a larger number of residents and this will generate a larger demand to travel in, out and within east Warrington.
- An increase in traffic on the highways network as a result of a growing population could exacerbate the current traffic congestion in east Warrington.
- There are further environmental implications associated with rising vehicular pollution.

Opportunities

- A greater number of people living in east Warrington will create greater demand to buy products and use local services resulting in a growth in the local economy.
- The town has been recognised as a growing location in previous reports (Centre for Cities – Cities Outlook 2015, The High Growth Index of Places, 2014). The towns booming population will build on Warrington's reputation as an exciting place to live and as a place of growth and investment. Warrington East Phase 2 stands to create a transport network fit for the future upon which east Warrington can capitalise.

So, what does this mean for Warrington East Phase 2?

East Warrington already suffers from periodic congestion – the A574 corridor experiences high volumes of traffic flows with regular delays at several junctions during the AM and PM Peak. With Warrington's population set to continue growing, there is a risk that east Warrington and the rest of Warrington's highways network could become overloaded with traffic, with further implications of rising congestion and greenhouse gas emissions.

Warrington East Phase 2 seeks to streamline traffic flow at three congestion hot spots. The works would ensure traffic can continue to travel to and through east Warrington in a timely manner whilst allowing for growth in traffic associated with Warrington's growing population.

7.3 Employment in east Warrington

The following section contains a summary of employment in east Warrington, both in terms of its residents employment levels and its role as a source of employment within the North West. A detailed breakdown of the employment status of east Warrington's population can be seen in Table 5 taken from the 2011 Census. Table 5 displays a positive employment situation in east Warrington, with 71.5% of east Warringtons working age population economically active and nearly 90% of these economically active individuals in full time employment.

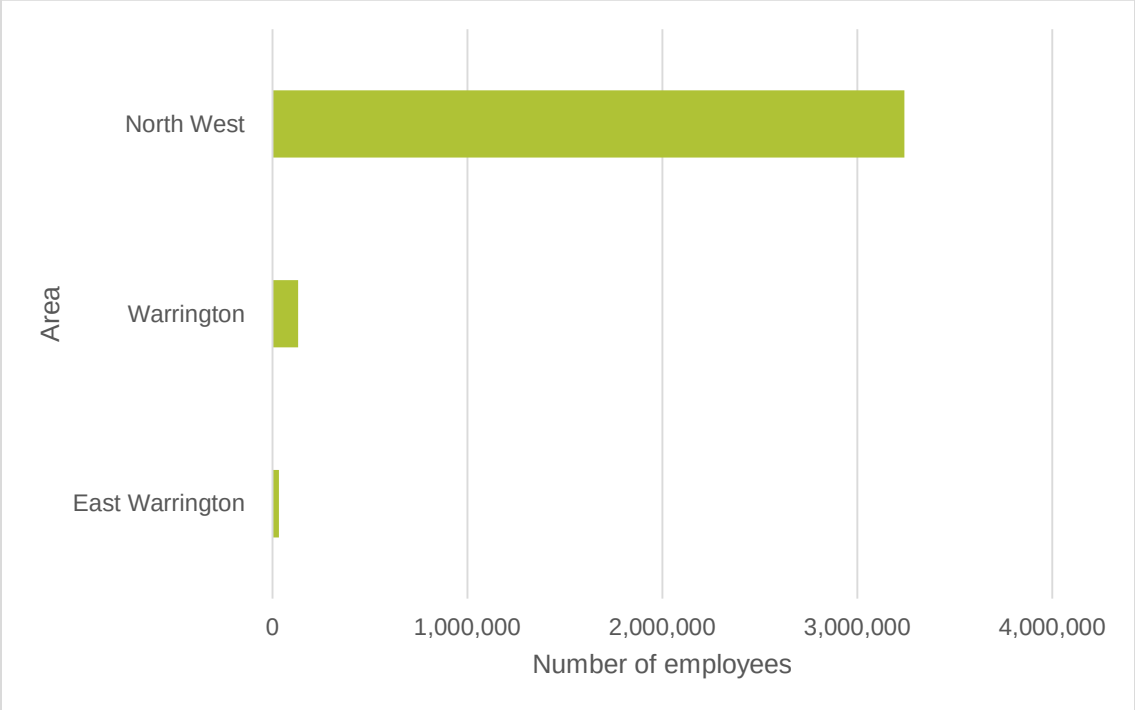
Table 5: Employment status of east Warrington's residents (2011)

Employment Status	Number of people
All residents aged 16-74	31,558
Economically Active	22,555
Economically Active: In Employment	20,093
Economically Active: Employee: Part-time	4,811
Economically Active: Employee: Full-time	13,200
Economically Active: Self-employed	2,082
Economically Active: Unemployed	1,375
Economically Active: Full time student	1,087
Economically Inactive	9,033
Economically Inactive: Retired	4,703
Economically Inactive: Student	1,310
Economically Inactive: Looking after family	1,064
Economically Inactive: Long term sick or disabled	1,490
Economically Inactive: Other	466
Unemployed: Age 16-24	410
Unemployed: Age 50-74	278
Unemployed: Never worked	153
Long-term unemployed	544

Source: NOMIS 2011

Figure 19 shows the number of people who were employed in east Warrington, Warrington and the North West in 2016.

Figure 19: Number of employees 2016



Source: Business Register and Employment Survey 2016

Employment growth data was unavailale at LSOA level. As such, a comparison between employment in Warrington, the North West and Great Britain is provided in Table 6. In this context, employment is defined as employees plus working proprietors. This accounts for the total number of persons in employment in the private and public sector working full time and part time during 2010 and 2015.

Table 6: Persons in employment (000s)

Area	2010	2011	2012	2013	2014	2015	Total Growth
Warrington	116.2	118.2	118.9	121.1	124.1	124.0	7.80
North West	3049.7	3,053.4	3,071.6	3,083.5	3,151.2	3,201.8	152.10
Great Britain	27,768.6	27,796.5	27,905.4	28,217.5	28,970.1	29,545.4	1776.80

Source: ONS Employment (thousands) by Local Authority County within Region

Table 6 shows an additional 78, 0000 in employment in employment in Warrington between 2010-2015, indicating a steady and sustainable growth. For the same period, a summary of the growth in employment between 2010 and 2015, as indicated by Table 6 is given in Table 7 on a percentage basis using 2010 as the base year.

A steady rise in employment is observed yearly, with only a small decline in employment taking place between 2014 and 2015. During the five-year period, Warrington displays an average growth rate of 6.71%. Employment growth in Warrington can be viewed as positive when compared with both the North West and Great Britain average. The employment growth projected for Warrington can be seen to be a proxy for the growth anticipated for east Warrington.

Table 7: Employment growth rate (% change)

Area	2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	Total Growth
Warrington	0.00%	1.72%	0.60%	1.89%	2.58%	-0.09%	6.71%
North West	0.00%	0.12%	0.60%	0.39%	2.22%	1.66%	4.99%
Great Britain	0.00%	0.10%	0.39%	1.12%	2.71%	2.07%	6.40%

Source: ONS Employment (thousands) by Local Authority County within Region

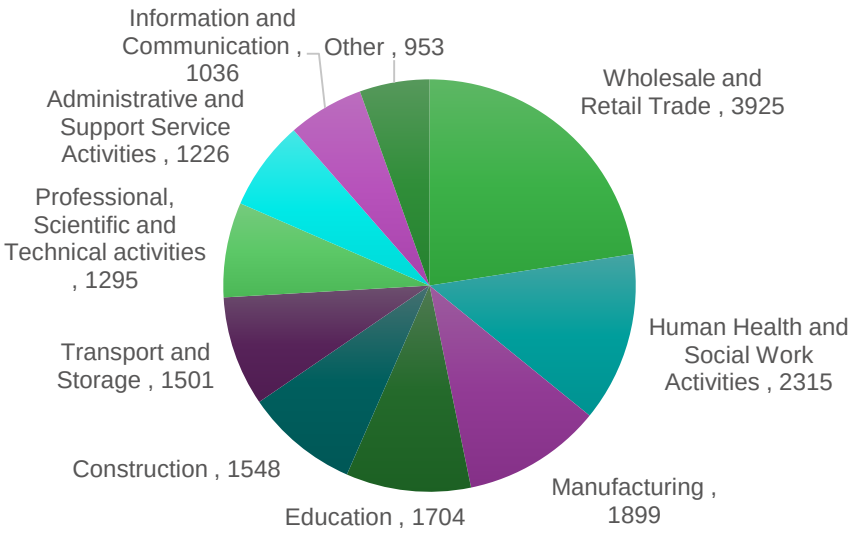
7.3.1 East Warrington's Employment Sectors

A diverse range of employment sectors can be found in east Warrington. A summary of the top 10 employment sectors in east Warrington are listed below:

- Wholesale and Retail Trade
- Human Health and Social Work activities
- Manufacturing
- Education
- Construction
- Transport and Storage
- Professional, Scientific and Technical Activities
- Administrative and Support Service Activities
- Information and Communication
- Other

Figure 20 bellow illustrates the proportion of east Warrington's workforce employed in each of the Top 10 industries established within east Warrington, indicating clear sector concentrations.

Figure 20: East Warrington employment sector distribution (2011)



Source: NOMIS

The wholesale and retail trade employ the largest number of east Warrington's workforce, this is a result of the large number of B8 class properties within east Warrington, dictating that the property must be used for storage or as a distribution centre. East Warrington also has a higher than average number of people employed in the Professional, Scientific and Technical sectors, primarily as result of the high concentration of these industries at Birchwood Park. This sector is expected to grow in the wake of the business parks newly awarded status as an Enterprise Zone within the Cheshire Science Corridor Enterprise Zone.

Issues

- Employment has been growing in east Warrington over the past five years and is anticipated to continue to continue.
- The demand to travel to these employment sites will be greater, leading to further congestion. There needs to be consideration of how people travel to work, with assurance that the highways network remains operational.
- There is a car commuting culture in east Warrington at present. There should be appropriate intervention to encourage a modal shift away from the private car to help further sustainable development and growth.

Opportunities

- East Warrington has a larger proportion of people working in professional, scientific, and technical activities compared with the national average. Increased employment within these sectors presents the opportunity to excel east Warrington as a destination of excellence in science and industry. Thereby attracting more jobs, employment opportunities and boosting the local economy.
- These sectors are set to grow with the expansion of Birchwood Park and the expansion of existing facilities within a close proximity such as Sci-Tech Daresbury, Omega, Warrington Waterfront and Port of Warrington.
- Increased employment within these sectors presents the opportunity to excel east Warrington as a destination of excellence in science and industry. Thereby attracting more jobs, employment opportunities and boosting the local economy.

So, what does this mean for Warrington East Phase 2?

Transportation can act as a catalyst for development and economic prosperity. Reliable and quick connections need to exist between key employment destinations in east Warrington to help increase economic productivity across Warrington and the North West.

Phase 2 works need to remove existing network pinch points and poor design that limits the growth potential of one of Warrington's key employment areas - Birchwood Park. Intervention that can reduce congestion in east Warrington, deliver better connections between workers homes and jobs, as well as access from east Warrington and the strategic network, will help improve the overall commuter experience and business movements that take place in east Warrington.

Together, this will help raise productivity and help attract more business investment in the east of Warrington. In turn, this could help encourage employment opportunities particularly in highly skilled positions for east Warrington residents.

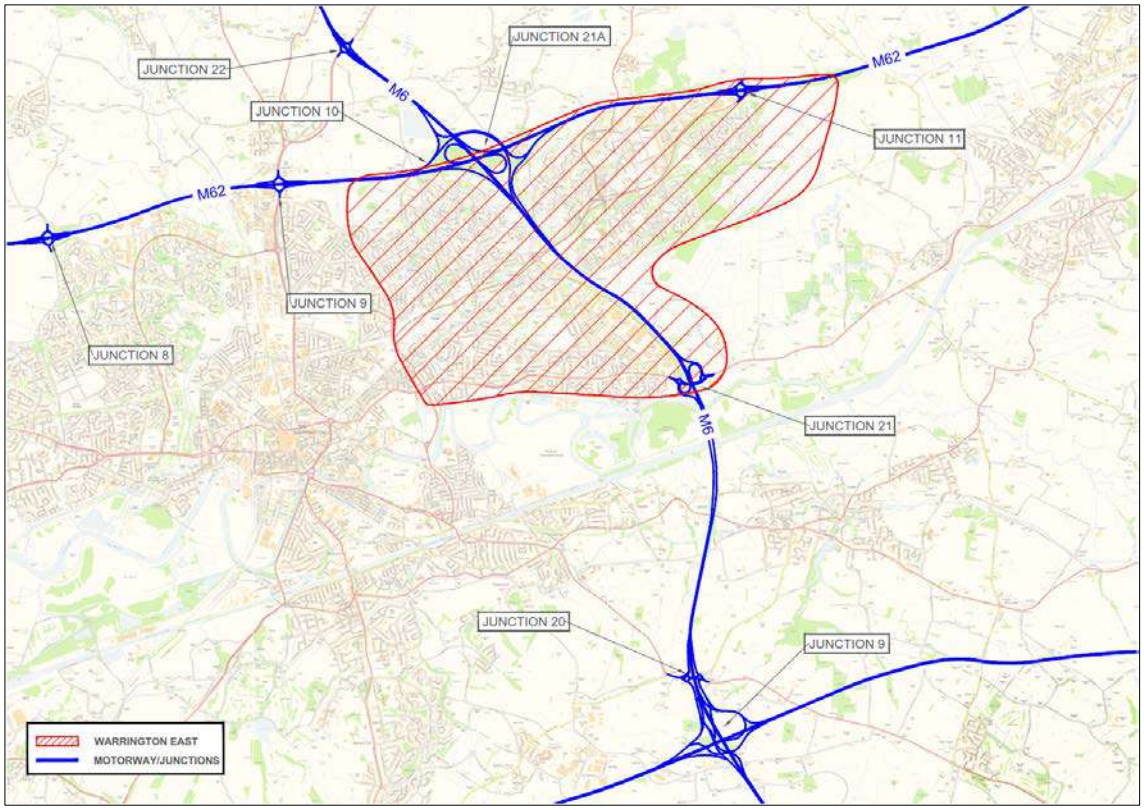
8 The Strategic Highway Network

This section evidences the key transport issues and opportunities framed within the wider Strategic Highway Network surrounding and penetrating east Warrington. Data has been sourced from a variety of locations: traffic counts, turning counts, annual average daily flow and ONS Census 2011.

8.1 Motorway box

East Warrington is bounded by the M6, with access from J21A – J21 to the west and the M62, with access from J10-J11 to the north, forming a 'motorway box' as illustrated in Figure 21.

Figure 21: Warrington East's motorway links



Source: Mott MacDonald

East Warrington's close proximity to the motorway network is undoubtedly a key contributing factor of the areas economic success and growth. It enables east Warrington to draw on talent from across the whole of the North West, whilst the resident workforce are able to travel further afield in the North West and UK to access employment in a respectable commute time. Associated frieght traffic can also quickly access the strategic network making the overall connectivity of east Warrington for both the movement of people and goods unrivalled.

The M62 J11 acts as a gateway into east Warrington, however traffic has to exit from the Motorway onto the A574 which is a single carriageway to access Birchwood and east

Warrington. At peak times this key link road experiences capacity issues as a result of traffic merging from the three lane motorway network into a single carriageway.

8.2 Motorway traffic flows

As part of the data collection excercise, traffic count data for the motorway network was sourced from Highways England's Traffic Flow Database System (TRADS) at key locations surrounding east Warrington. Annual Average Daily Flow's (AADF) of these locations within east Warrington are summarised in Table 8.

Table 8: Two-way AADF counts for motorway locations surrounding East Warrington (rounded to nearest 100)

Motorway	Section	AADF (Veh)
M6	Junction 19 – Junction 20	67,600
M6	Junction 20 – Junction 21	169,900
M6	Through Junction 21	144,900
M6	Junction 21A – Junction 22	111,400
M62	Junction 7 – Junction 8	106,100
M62	Through Junction 8	91,700
M62	Through Junction 9	94,100
M62	Junction 9 – Junction 10	122,900
M62	Through Junction 11	102,300
M62	Junction 11 – Junction 12	116,400

Source: AECOM ATC Link Flow Calculations

Table 8 shows east Warrington's surrounding motorway box outlined in Figure 21 to have consistently heavy flows throughout. Between Junction 9 and Junction 10, 122,900 vehicles were detected, a significant drop in flows can then be seen at Junction 11 with 102,300 vehicles. It can therefore be derived that 20,600 vehicles leave the M62 at J11, Birchwoods dedicated motorway junction. This traffic then uses the A574 in order to access Birchwood and east Warrington, a road with inadequate capacity to accommodate such heavy flows resulting in regular delays. The road has further strategic importance in that it facilitates access to Birchwood Park and also serves as a diversionary route when incidents occur on the M62 which can further add to delays.

Recent work undertaken by Mott MacDonald for the Highways Agency (HA) to develop a pilot metering system was used on the M6/M62 Croft Interchange (M62 J10) with the aim of reducing current AM peak delays. Research during this work highlighted congestion issues related to Birchwood Way at the M62 J11. During observations and as part of the traffic modelling for the pilot, it was identified that some of the congestion experienced at J10 is consistently created by conditions at J11, caused by local traffic using Birchwood Way.

Impacts on vehicular speed of the wider motorway network were also seen to be associated with congestion at Birchwood. Analysis of Trafficmaster data for June 2015 displayed slow traffic speeds from the M6 towards Birchwood during the AM peak with an average speed of 10-20mph compared with 40mph during the inter-peak and PM peak[13]

[13] Warrington Borough Council- Warrington Transport Summary

Figure 22: M62 westbound off slip at 8:15am and queue towards Birchwood at 8:40am

Source: Mott MacDonald

Issues

- Congestion is regularly experienced at the M62 J11 due to queueing onto the A574 at peak times.
- Congestion at M62 J11 is adversely impacting the wider strategic network with queues at J10 (Croft) being directly linked with the congestion experienced at J10 as a result of congestion on the A574 as traffic exits at J11.

Opportunities

- Improved and more reliable access to Birchwood will reduce congestion at the M62 J11 and help to reduce congestion at J10 Croft, which consistently experiences long delays at peak hours, partially as a result of the demand for M62 J11.
- Reduced congestion at the M62 J11 could improve journey reliability times for both people and goods, further improving network resilience.
- Additional capacity along the A574 will reduce queuing on the M62 J11 slip road.

So, what does this mean for Warrington East Phase 2?

The A57 provides key access to and through east Warrington for both commuters and residents whilst also acting as a diversionary route from the M62 where there are motorway incidents. The A574 corridor experiences acute periods of congestion, with demand regularly exceeding capacity. Queues on the approach into Birchwood are currently having a detrimental Impact on the wider strategic highway network, with reduced vehicular speed and regular delays on the M62 directly associated with congestion on the A574, as traffic tries to exit on the A574 at junction 11.

Warrington East Phase 2 presents the opportunity to provide additional capacity to the network by the modification of a number of junctions along the A574. Reduced congestion on the local highways network will improve ambience and journey reliability for both people and goods heading to and from the strategic network. Additionally, reduced congestion on the M62 J11 approach to east Warrington stands to reduce the frequency and severity of delays on the M62, particularly at J10 (Croft). Improved journey time reliability across the strategic highway network stands to encourage investment and development in the east Warrington area, including economic growth and employment.

9 The Local Transport Network

This section outlines the key issues and opportunites assoicated with the local transport network of east Warrington, providing a a mode by mode analysis.

9.1 Local highway network

East Warrington originally developed as part of the Warrington New Town plan which was based upon car borne commuting, and featured a distinctive road network to support this vision. However, the network was never completed to its full plan[14]. As development in the area has increased, the constraints of the local road network have become more apparent with congestion and delays becomming more frequent. The following sub-sections look at this in more detail.

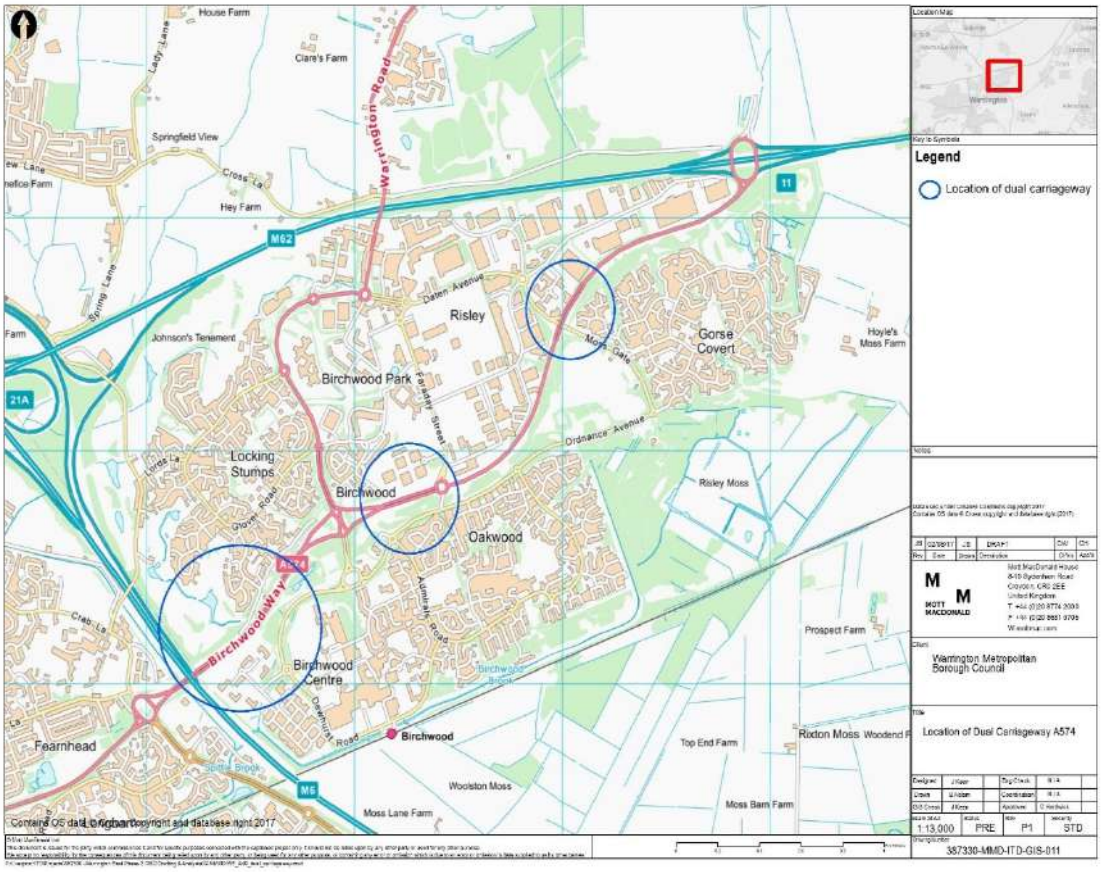
9.1.1 A574 Birchwood Way congestion; Moss Gate roundabout to the M62

The A574, Birchwood Way is predominantly a national speed limit single carriageway, with some sections dualled (Figure 23). Dual carriageway exists between College Place roundabout and Oakwood Gate roundabout, Oakwood Gate to the A574/Faraday roundabout, and from the A574/Moss Gate roundabout for approximately 150m.

Birchwood Park relies primarily on the A574, Birchwood Way for access to the site with access points on this route from the North East and the West, with the exception of Warrington Road there are no alternative routes to this key employment area. This ultimately results in large amounts of traffic being funnelled along the A574, resulting in congestion particularly during peak times. An analysis of traffic flows usting Automatic Traffic Count surveys (ATC's) on the A574 is detailed on the next page.

[14] Mickledore- Economic Strategy Warrington East

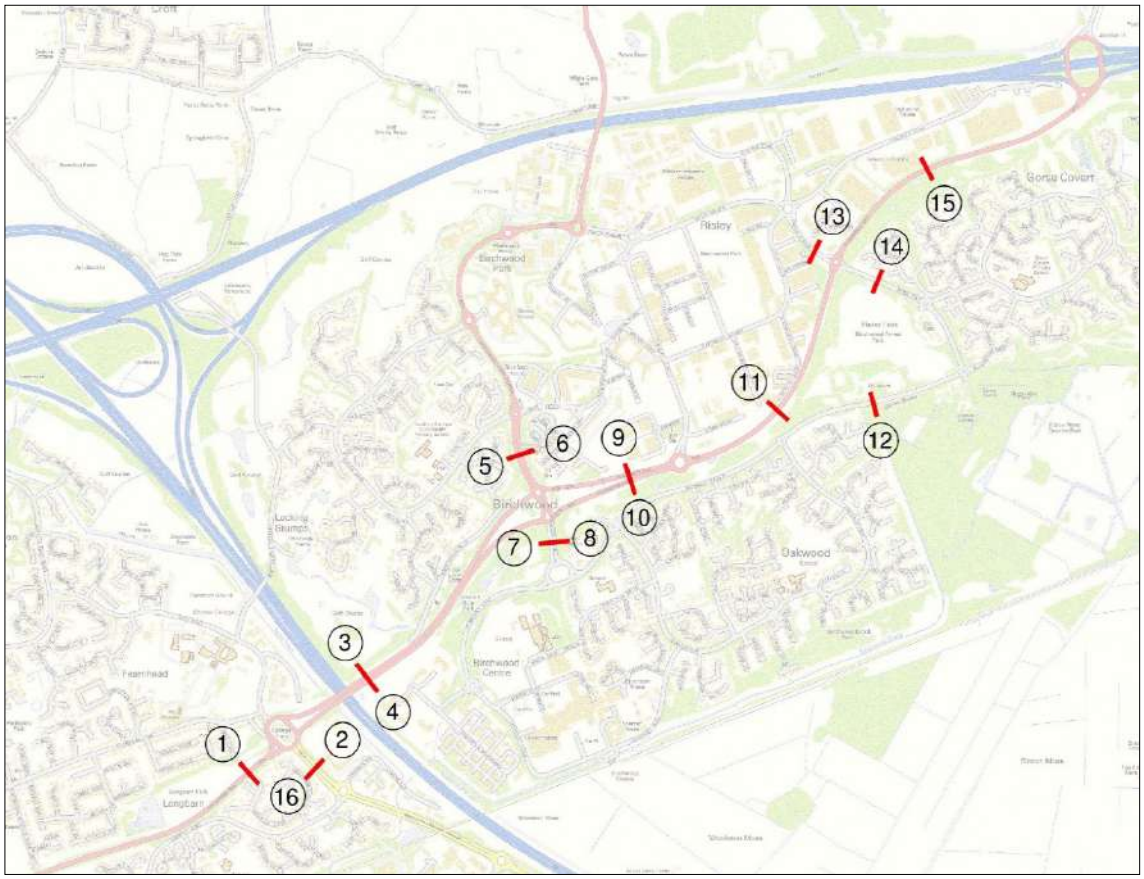
Figure 23: Sections of dual carriageway on the A574



Source: Mott MacDonald

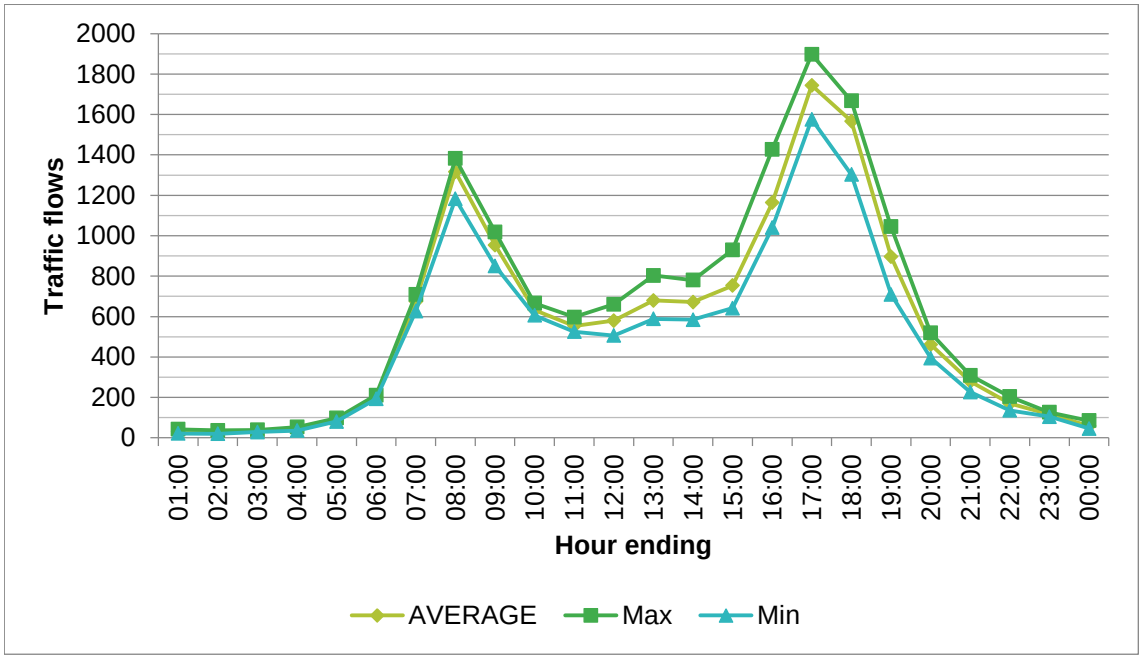
Traffic counts were conducted in May 2016 at 16 locations along the A574 Birchwood Way corridor. Shown in Figure 24. ATC location 15 provides a clear indication of the volumes of traffic entering and leaving east Warrington from the M62. This is illustrated in Figures 25 and 26 which shows the average hourly traffic flows at this location in both eastbound and westbound directions. Location 15 data was selected as this ATC is closest to the M62 J11; between the motorway junction and the ATC there is no exit/entrance for vehicles meaning that all traffic exiting or entering the motorway using the A574 is accounted for from this point.

Figure 24: Locations of traffic counts along the A574, Birchwood Way



Source: OS Maps

Figure 25: ATC at location 15; average weekday traffic flow along A574 Birchwood Way (eastbound)

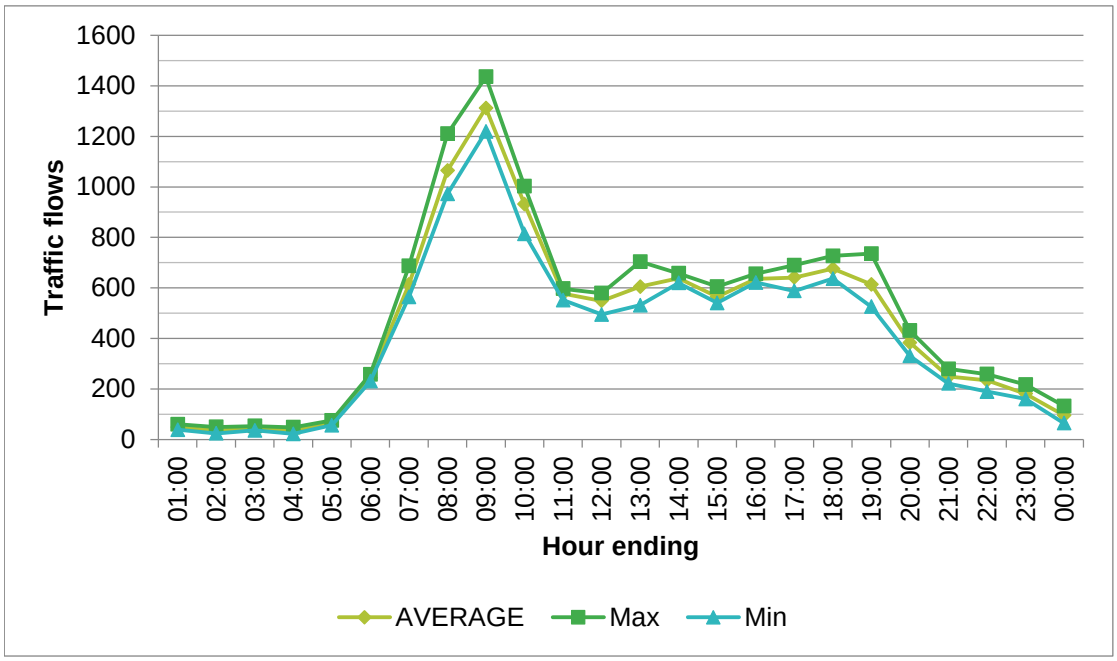


Source: Mott MacDonald

For eastbound flows heading towards the M62, there are two distinct and isolated peaks in traffic flows. These are found in the morning 07:00-08:00 (AM peak) and evening 17:00-18:00 (PM peak). It can be seen that during both peak periods that this section of Birchwood Way experiences substantial traffic flows with 1,317 and 1,744 vehicles registered by the counter in the AM and PM peaks, respectively. According to the Design Manual for Roads and Bridges (DMRB) Volume 5 Section 1, this represents capacity for a high standard single carriageway road).

The average hourly traffic flows were also produced for westbound flows heading into Birchwood and Warrington (Figure 26). There is an established AM peak (08:00-09:00) and PM peak (17:00-18:00), flows are far greater in the morning than in the evening peak. A summary of the morning, inter-peak and evening peak flows in both directions are shown in Figure 27.

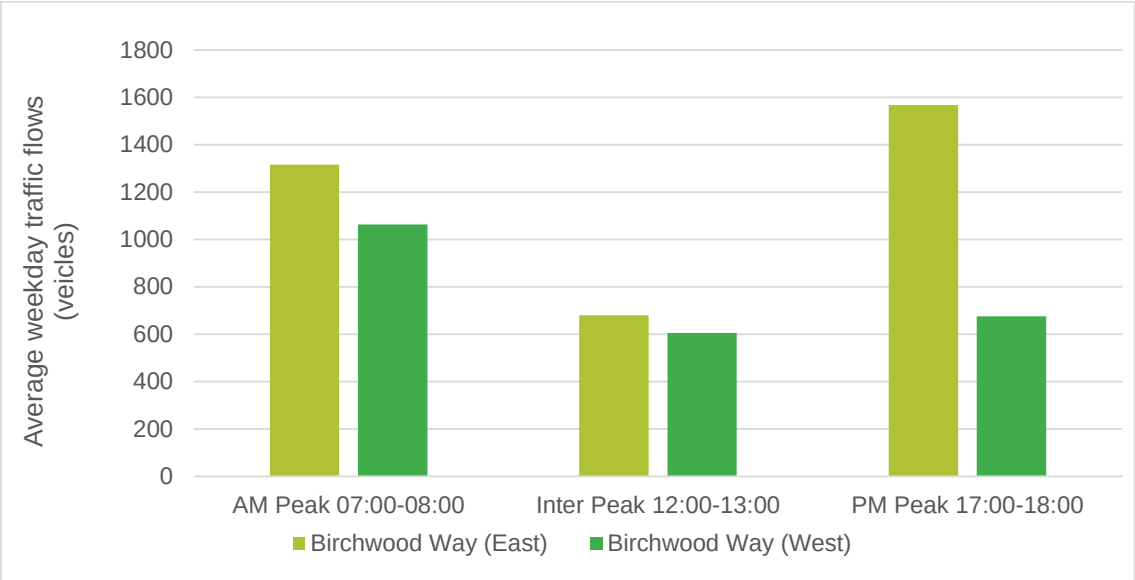
Figure 26: ATC location 15, average weekday traffic flow along A574, Birchwood Way (westbound)



Source: Mott MacDonald

In comparing both average eastbound and westbound traffic, flow is greater when travelling eastbound towards the M62 J11. This is shown when comparing the average weekday peak flows for both directions of traffic at ATC location 15 (Figure 27).

Figure 27: Average weekday peak traffic flow on the A574, Birchwood Way ATC location 15



Source: Mott MacDonald

Due to the high volume of traffic on the A574 and the transition between dual carriageway and single carriageway after the junction with Moss Gate, a number of congestion problems are created on the approach to the M62 J11. After the Moss Gate junction, the dual carriageway merges to a single carriageway in a relatively short distance (approximately 150m). As a result, large volumes of traffic are funnelled in quick succession into a single carriageway with inadequate capacity for the growing demand. This causes traffic to slow and queues form that extend back to the junction between Moss Gate and A574 Birchwood Way. Work undertaken as part of the Warrington East Phase 1 Access improvements also documented this effect.

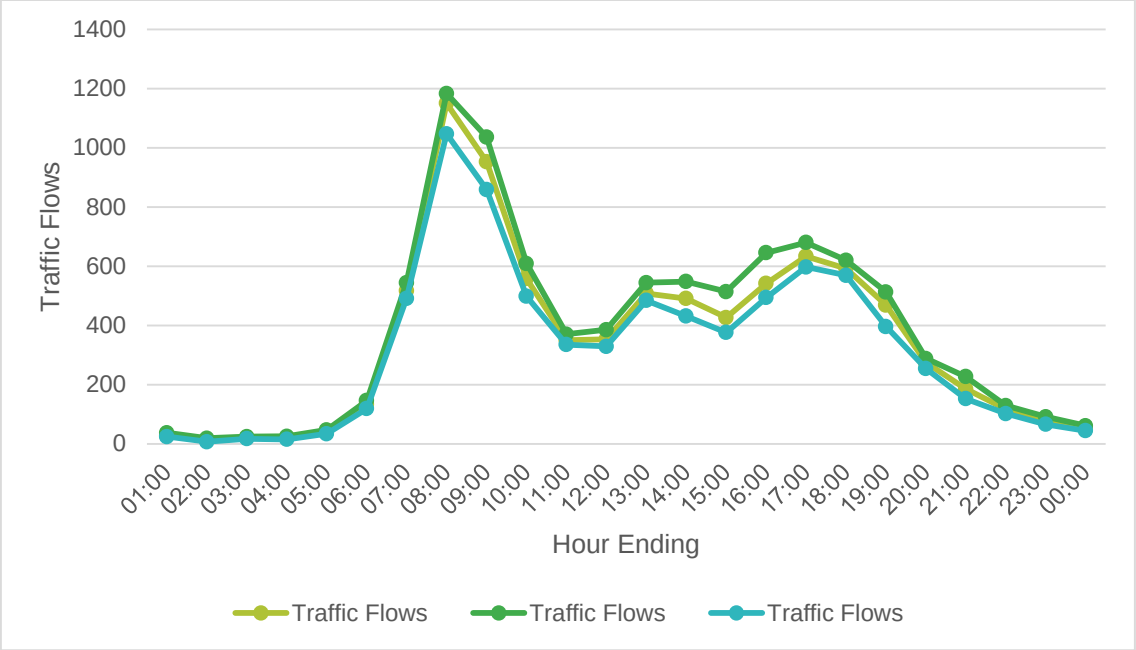
9.1.2 Oakwood Gate/Birchwood Way Roundabout

The following section provides a summary of traffic flows at ATC location 9 and ATC location 10, shown previously in Figure 24. Traffic flows here indicate the levels of traffic on the immediate approach to Oakwood Gate/Birchwood Way Roundabout, a proposed site of intervention as a component of the Warrington East Phase 2 scheme. Figure 28 and 29 below display the average daily flows at this site (eastbound, and westbound respectively), alongside the maximum and minimum flows in 2016.

The largest flows eastbound (Figure 28) occur during the AM period with the AM peak (07:00 - 08:00) registering 1150 flows. Flow thereafter decreases, but remains substantial in size fluctuating between 350 and 650 average hourly flows.

Two further peaks occur; the interpeak (12:00-13:00) with 508 average hourly flows registered and the PM peak (16:00-17:00) with 634 average hourly flows registered.

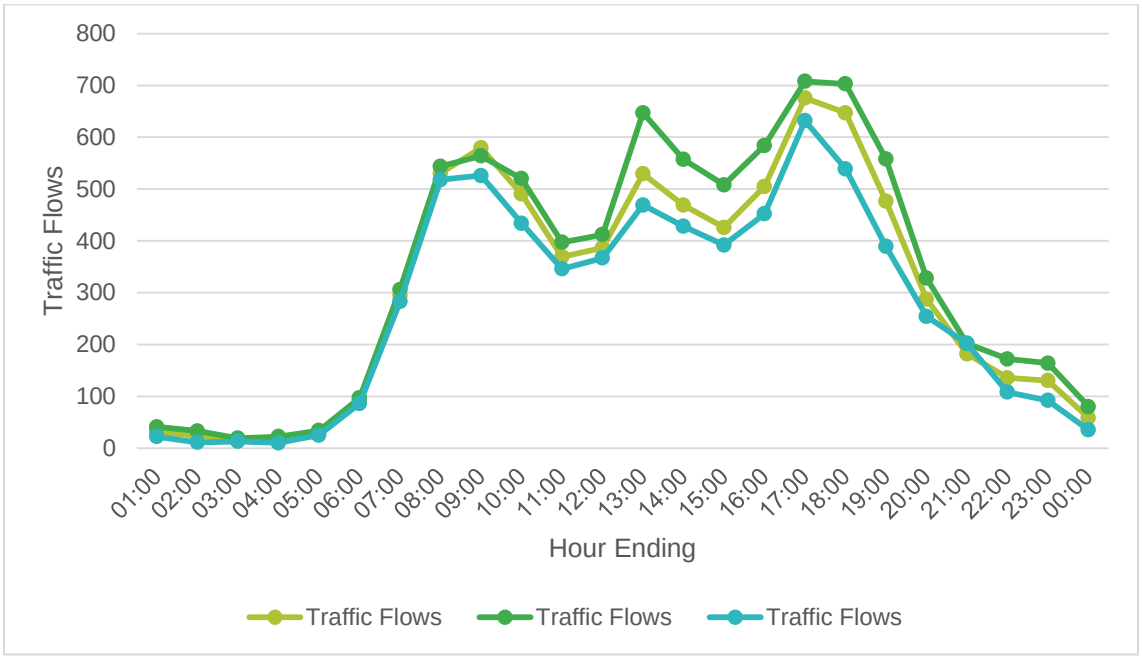
Figure 28: ATC location 10, average daily flows along A574 Birchwood Way eastbound



Source: Mott MacDonald

For westbound flows, heading towards east Warrington's employment sites and Warrington's central urban area, heavy traffic flows are observed throughout the day and hourly traffic flows fluctuate between 300 and 650 (Figure 29). Three distinct peaks are identified and these occur in the morning 07:00-08:00 (AM Peak), 12:00 -13:00 (Interpeak) and 16:00-17:00 (PM Peak). The largest average hourly traffic flows of 676 occurred during the PM peak.

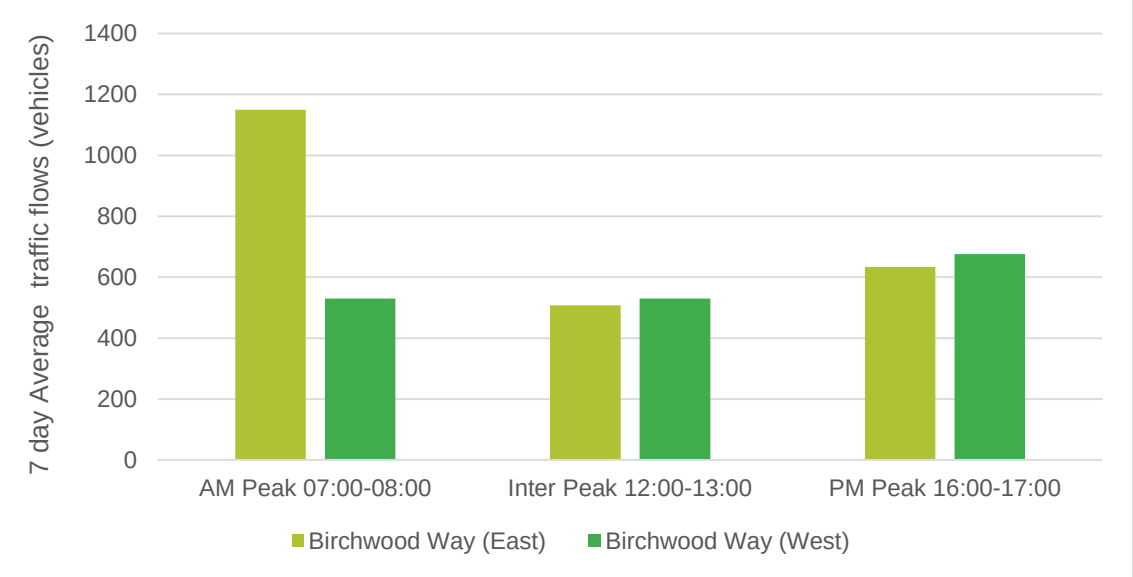
Figure 29: ATC Location 9, average weekday flows along A574 Birchwood Way westbound



Source: Mott Macdonald

The eastbound and westbound weekday average peak flows were compared for ATC location 9 and 10, these are displayed in Figure 30.

Figure 30: Average weekday peak traffic flows on the A574, Birchwood Way ATC location 15



Source: Mott MacDonald

The analysis shows that the largest flows take place at this location during the AM period, travelling eastbound towards the M62. It can be inferred that the biggest risk of congestion and delay occurring at Oakwood Gate would likely be in the morning eastbound out of Warrington. Although smaller in size, considerable flows were registered in the interpeak and PM peak and could cause issues of congestion and delay.

9.1.3 College Place Roundabout

The following section provides a summary of traffic flows at ATC location 3 and ATC location 4, shown previously in Figure 24. The two ATC locations are found directly east of College Place Roundabout. These traffic counts provide an indication of traffic exiting and entering College Place Roundabout. At this location the A574 moves from a single carriageway to a dual carriageway, doubling its capacity on the approach into east Warrington.

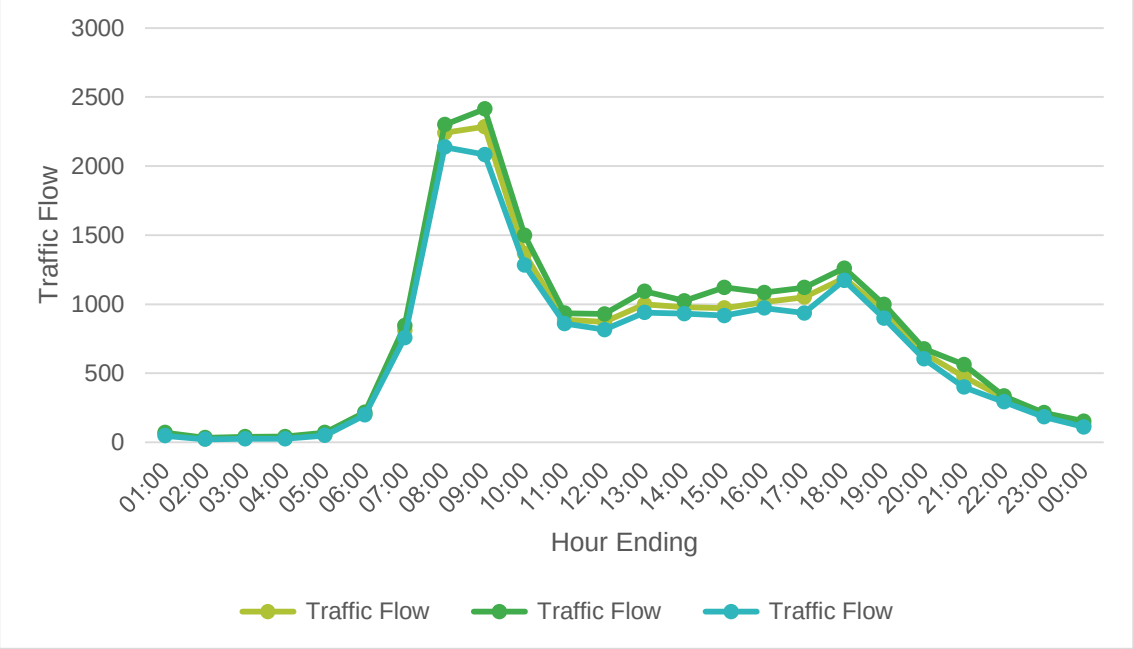
Figures 31 and 32 below display the average daily flows at ATC location 4. In both eastbound and westbound directions respectively. In Figure 31 traffic is heading from central Warrington towards Birchwood Park and the M62. Heavy traffic flows are observed throughout the duration of the day. A clear isolated peak can be seen at 08:00-09:00 (AM Peak). Nearly 2500 flows were registered at the ATC 4 location.

The heavy flow of traffic during the morning could be a result of the high proportion of Warrington's workforce who commute to east Warrington and who are travelling onwards towards the M62. This high volume of traffic at College Place results in long queues at peak hours.

After the AM period, traffic flow falls but remains large in size, fluctuating between approximately 850 and 1200 average hourly flows. There is no substantial peak in flow at midday. However, a PM peak of 1189 average hourly flows occurs at 17:00-18:00. This is likely to be a result of

Warrington's workforce returning home either in east Warrington or further afield using the Strategic Road Network.

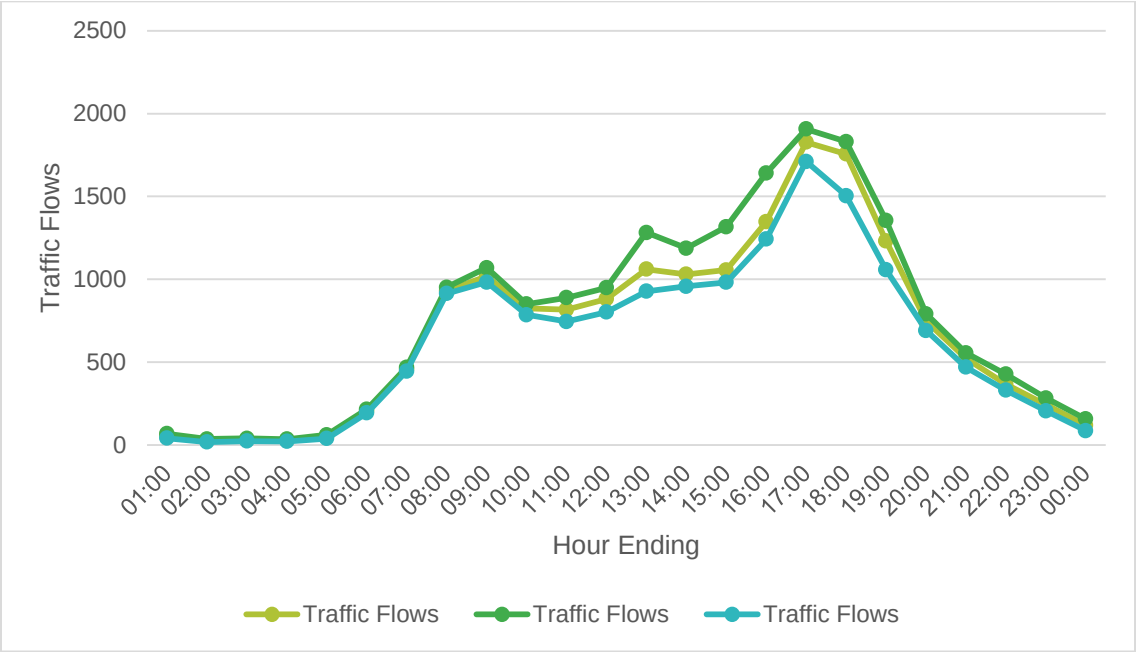
Figure 31: ATC location 4 average daily flows along A574 Birchwood Way eastbound



Source: Mott MacDonald

Figure 32 illustrates the average traffic flows heading westbound, exiting east Warrington and heading towards Central Warrington. Three peaks are identified, the largest of which is the PM (16:00-17:00), 1907 flows were registered by the ATC at this point. The direction of travel suggests this is caused by large numbers of commuters travelling out of east Warrington towards homes in central, western, and southern Warrington. The A574 transitions after this point back to a single carriage way presenting the potential for congestion to occur due to inadequate capacity to accommodate this heavy PM peak.

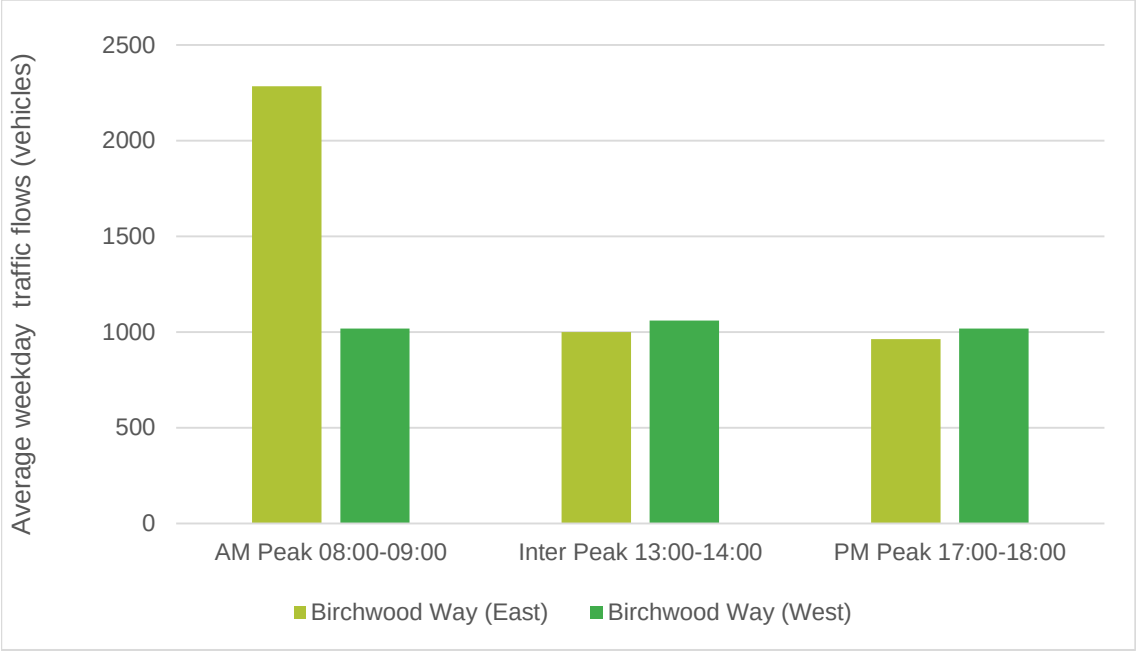
Figure 32: ATC location 3 average daily flows along A574 Birchwood Way westbound



Source: Mott MacDonald

The eastbound and westbound weekday peak flows were compared for ATC location 3 and 4, these are displayed in Figure 33. The analysis shows that large volumes of traffic travel both east and west from the roundabout during all peak periods. Additionally, substantially large flows take place eastbound in the AM peak with flows exceeding 2000 in size.

Figure 33: Average weekday peak traffic flows on the A574, Birchwood Way ATC location 15



Source: Mott MacDonald

College Place serves as a key junction and gateway into and out of Warrington. Considering the large flow that takes place through the junction, there is a risk of the highway becoming overloaded with movements and this key entrance and exit to Warrington becoming seriously congested and an inconvenience to residents, workers and business.

9.2 Key network constraints

East Warrington's local highways network has a number of key constraints which exacerbate congestion along the A574 corridor and the immediate periphery, as detailed above. The three key issues associated with the local highway network are:

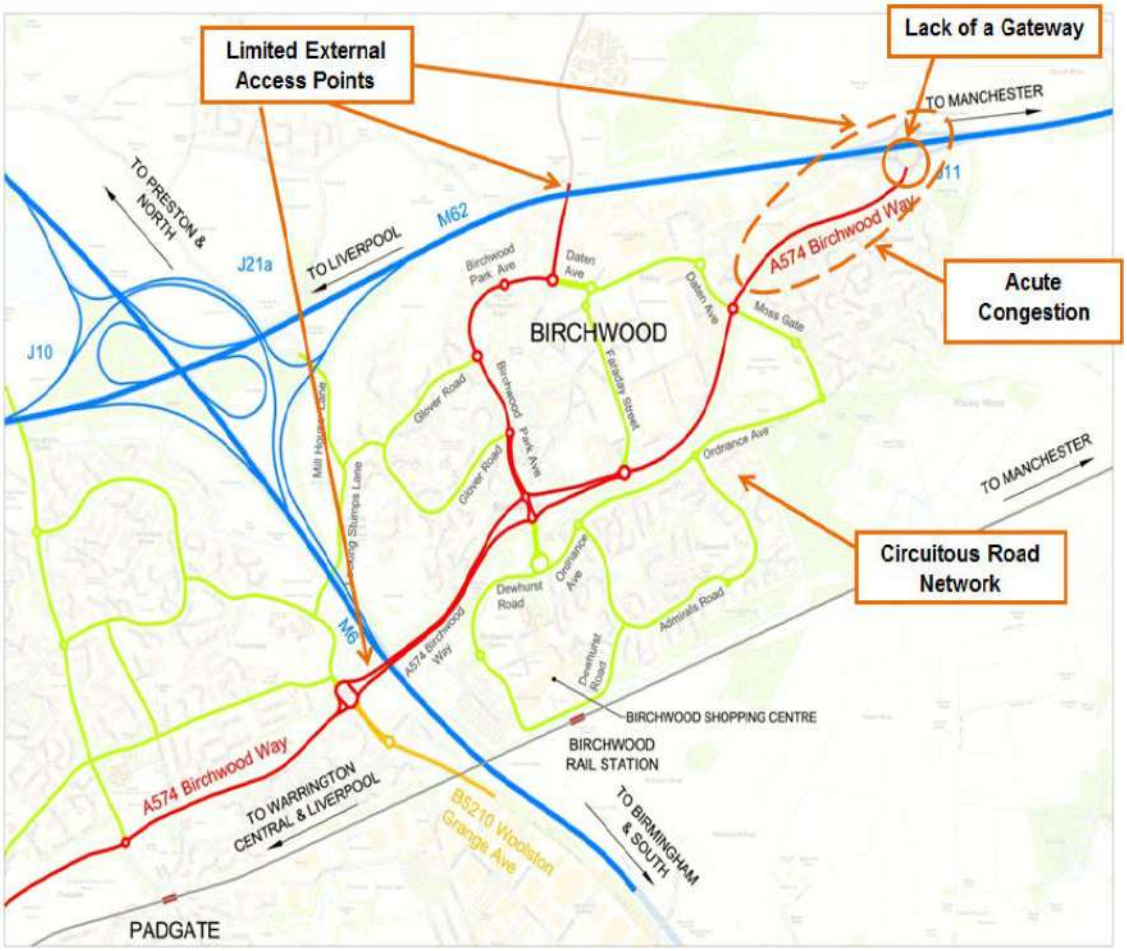
- Limited external Access Points
- Circuitous Road Network
- Lack of Gateway

9.2.1 Limited external access points

A key constraint of the local highways network of east Warrington is that there are only three main access roads into the entire area and these serve both employment and residential sites:

- From the north east, there is a direct link from the M62 J11 along the A574 Birchwood Way
- From the north, there is the A574 Warrington Road from Culcheth and Leigh which connects into Birchwood Park Avenue and Daten Avenue
- From the west on the A574 Birchwood Way; this route is used to access Birchwood from Warrington and also by people exiting the M6 at J21 and exiting the M62 to avoid the congestion experienced between J9 and J11

Figure 34: Key local transport network issues



Source: Mott MacDonald

Although the close proximity of the motorway and railway lines provide the area with excellent links to the wider region they also act as major barriers to more local movements and restrict the options for increasing the number of access points into the area. These obstructions result in traffic being funnelled primarily along the A574 Birchwood Way and causing congestion.

9.3 Circuitous road network

A circuitous internal road network, shown in lime green in Figure 33, compounds the access issues facing east Warrington. The residential areas have been linked to a looped spine road; Ordnance Avenue which is located just south of Birchwood Way. Properties are accessed from Moss Gate or Ordnance Avenue which in turn link with Birchwood Way, either at Daten Ave/Moss Gate or at the Oakwood Gate/Birchwood Way roundabout. The residential areas to the north are linked by Glover Road which loops onto the A574 Birchwood Park Ave north of its junction with Birchwood Way at the Oakwood Gate/Birchwood Park roundabout.

Eastbound traffic from Birchwood Park is likely to be divided between the Daten Ave/Moss Gate roundabout and the Oakwood Gate/Birchwood Way roundabout whilst all the westbound traffic commonly travels through the Oakwood Gate/Birchwood Way roundabout towards Warrington town centre.

Key employment areas including Birchwood Park and Birchwood Boulevard have road links to the A574 Birchwood Way on Daten Avenue or Birchwood Park Avenue, which form a perimeter road around the key employment areas, or onto Faraday Street which runs through the employment zone. Again, traffic flows are funnelled through the Daten Ave/Moss Gate junction or at the Oakwood Gate/Birchwood Way roundabout, with some using the Faraday Street roundabout junction with Birchwood Way.

The combination of limited access points and such a circuitous and constrained internal road network results in congestion and delays on a day-to-day basis; not only to private vehicles, but also to public transport as it has no alternative but to use the circuitous looped road system.

9.3.1 Lack of a gateway

Providing access directly from the motorway, the A574 Birchwood Way at its junction with the M62 J11 is considered the main access point to east Warrington. However, at this point Birchwood Way is a single lane carriageway with little signage that provides an unremarkable entrance to this key employment site. Instead of creating a sense of arrival the single carriageway, which cannot meet demand at peak times, creates a poor first impression for visitors, including potential occupiers and investors to the area.

Issues

- High volumes of traffic use the A574 when travelling to and from east Warrington. The A574 corridor is nearing capacity.
- The A574 is the main access route to east Warrington and the Birchwood employment hub-Birchwood Park. If traffic increases, the road will become increasingly congested and incident prone.
- Regular congestion may have a detrimental effect on economic productivity as commuters and businesses are deterred by the prospect of traffic delays.
- Limited external access points and an internal circuitous road network are exacerbating the congestion problems along the A574 corridor.

Opportunities

- Improvements to the A574 will ease congestion and bolster the resilience ensuring east Warrington's residents and workers can continue can travel in the area without excessive delay.
- Congestion was reported as a key constraint for new businesses locating to east Warrington. Reducing congestion and existing network delay along the A574 could help improve network resilience. In tandem this could help raise the business occupancy level within east Warrington and fill existing vacant office space as east Warrington becomes viewed as a more attractive location.

So, what does this mean for Warrington East Phase 2?

The A574 corridor currently experiences acute periods of congestion, with demand regularly exceeding capacity. Additionally, congestion is further exacerbated by numerous other detrimental factors within the local highways network, not least the lack of other external access points.

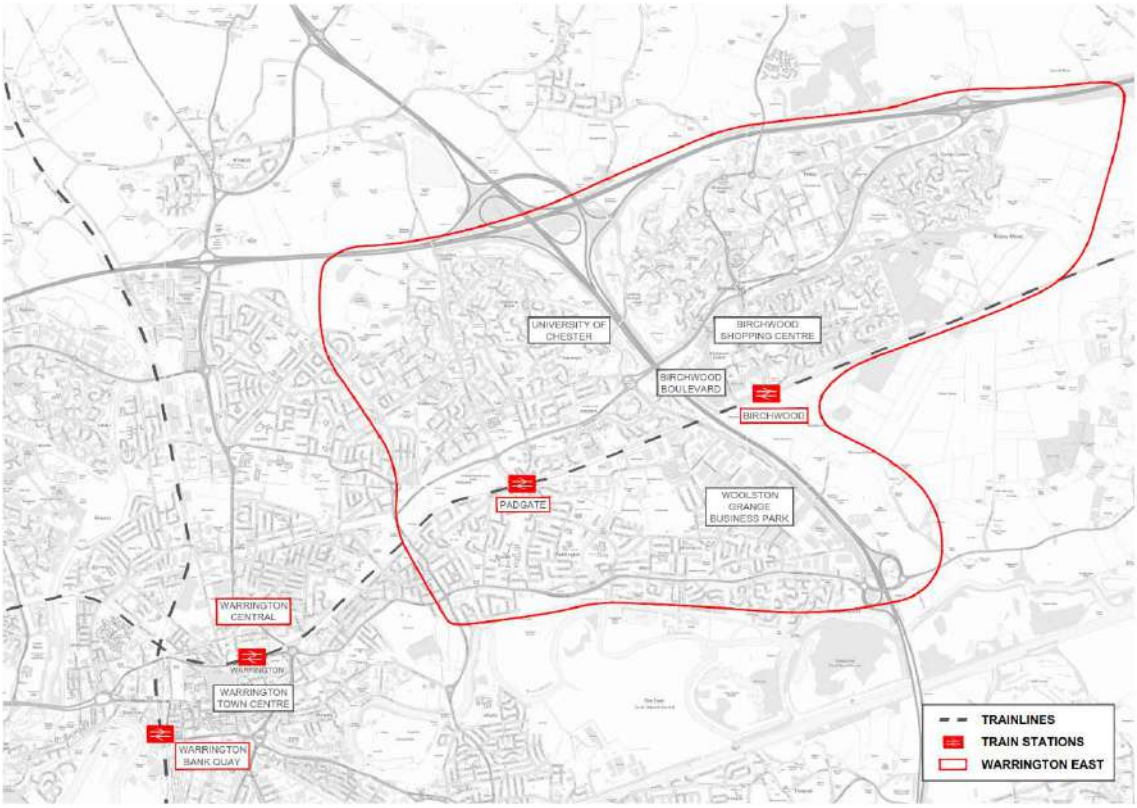
Warrington East Phase 2 presents the opportunity to provide additional capacity to the network by the modification of a number of junctions along the A574. Reduced congestion on the local highways network will improve journey ambience and journey reliability for both people and goods. Improved journey time reliability stands to encourage investment and development in the east Warrington area, inducing economic growth and employment.

9.4 Rail provision in Warrington East

Rail plays a crucial role in the transport of people and goods. Warrington has two main railway stations; Warrington Bank Quay sits on the West Coast Main Line and offers fast connections to the south of England and Scotland. Warrington Central station sits on the Liverpool to Manchester line and provides east-west connections between both cities. Both main railways

stations provide connecting services to east Warrington's local railway station: Birchwood. Birchwood railway station can be seen below in Figure 35.

Figure 35: Rail provision in east Warrington



Source: OS Maps

Birchwood station is located immediately next to Birchwood Shopping Centre and Birchwood Park is approximately 1.5 miles north-east of the station, both key destinations for workers and shoppers. Table 9 shows the estimated number of passengers who entered Birchwood station in 2015-16. Compared with other Warrington stations, Birchwood 's passenger numbers are a third of Warrington Centrals' and just under two thirds of Warrington Bank Quay's.

Table 9: Estimates of station usage 2015-2016

Station	Estimate of entries
Birchwood	335,225
Warrington Bank Quay	555, 200
Warrington Central	900,894

Source: Office of Rail and Road

Analysis in Section 8.4.2 found that 5.5% of east Warrington's commuters used public transport as their primary mode of transport; these were. most commonly rail journeys into the area by residents of Manchester

In summary, only a small percentage of east Warrington's residents and workforce use Birchwood station to commute to work. This may be due to the station being located some distance away from east Warrington's key employment destination- Birchwood Park, which is a

lengthy 30-minute walk from the station. However, a courtesy bus is provided during peak hours for employees of the business park.

Issues	Opportunities
• The rail station is just within walking distance of east Warrington's major employment destination- Birchwood Park. However, the connecting trip on foot is long and segregated footpaths are inconsistent. This may act as a barrier to the use of rail in the area.	• Birchwood rail station offers fast connections to Liverpool and Manchester and a car park which can accommodate 39 cars. With improved road and pedestrian access to the station the site could become a key park and ride destination, facilitating journeys further afield. • Warrington town centre can be reached quickly using train services. Therefore, there is opportunity for residents and workers to quickly travel to the town centre as well as other destinations located on the West Coast Main line using a more sustainable mode of transport.

9.5 Bus provision in Warrington East

The centre of Warrington acts as a hub for bus activity with buses starting and terminating at Warrington Bus Interchange. As a result, the largest group of bus users who travel to east Warrington are those who travel from Central Warrington. Those travelling to east Warrington from other locations across the borough and wider region are less likely to use the bus despite bus routes providing extensive cover across Warrington and various other residential areas. Arguably, the low levels of bus patronage are due to the congestion issues which are present here and the additional travel time which is associated with bus travel.

Services 25 and 17 provide the main route in towards east Warrington and travel along Birchwood Way to access east Warrington. It should be noted that both these services also connect with Birchwood Railway Station. The successful integration of these two modes of transport potentially present a sustainable multi modal transport route for those wishing to travel to east Warrington.

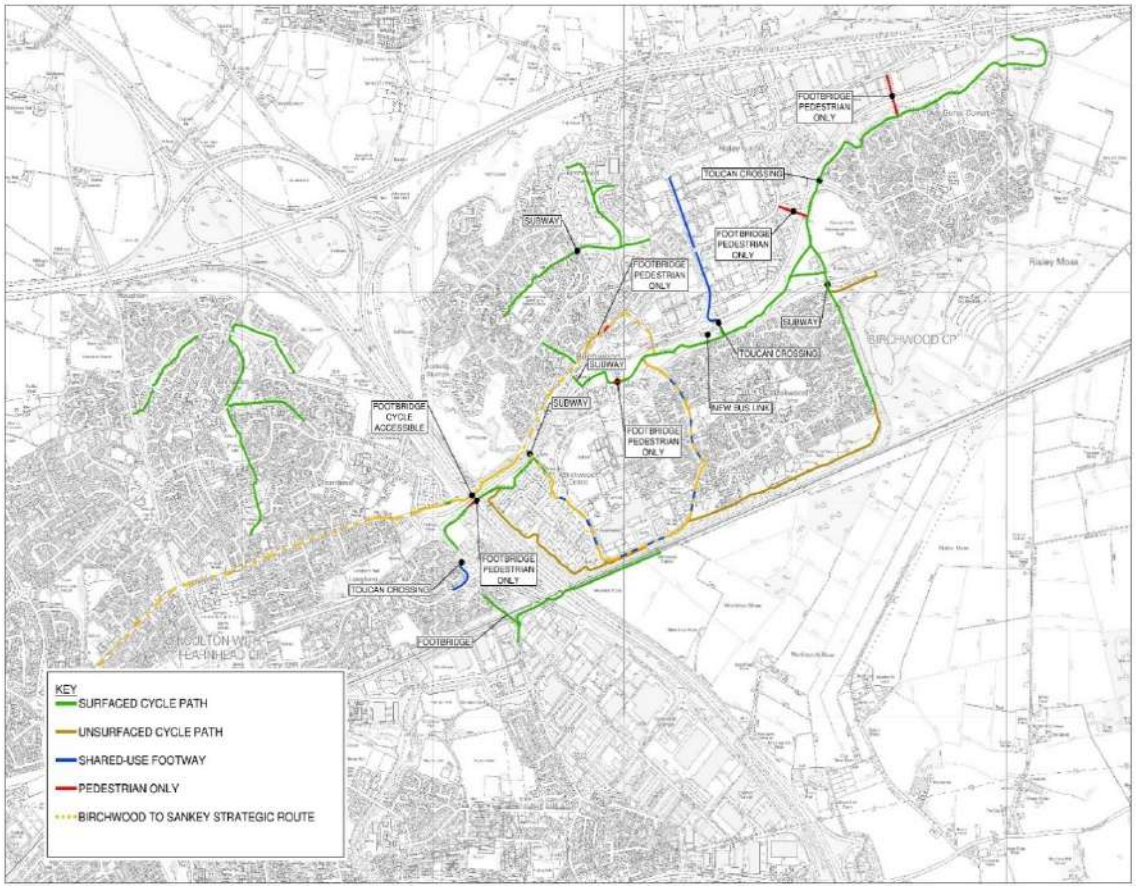
However, buses currently experience delays when travelling through east Warrington due to congestion on certain links and junctions, including Birchwood Way. This results in large variations in journey times, which act as a deterrent to potential bus users and ultimately restricts users to travelling by car, exacerbating the current congestion problem and creating an unsustainable commuting culture.

Issues	Opportunities
• Bus travel in east Warrington is minimal despite local services being frequent and having good geographical coverage. • Bus travel times are vary largely making this mode unreliable for commuters.	• Addressing a number of key network pinch points along Birchwood Way could help enhance bus services travelling along the highway. Scheme interventions could help reduce congestion and delay thus improving bus travel in east Warrington. • An increase in bus patronage could reduce current pollution levels in east Warrington, facilitating a more sustainable transport network here.

9.6 Cycling provision in Warrington East

Cycling presents a healthy, affordable and active mode of transport. Cycling is effective for travelling distances under 5km and allows users greater personal mobility when car travel or public transport is unavailable. Figure 36 below provides a cycle map of east Warrington.

Figure 36: East Warrington cycle routes



Source: Mott MacDonald

Cycling conditions in east Warrington can be viewed as quite restrictive; most cycle routes are present on roads which are unsegregated between car and bike. High volumes of fast moving traffic pass through this part of Warrington. The conditions are likely to make travel using a bike less desirable in east Warrington.

The A574 Birchwood Way has a surfaced cycle path along large stretches of the road however the path presents a lack of continuity in its provision and quality with sections of the carriageway having an unsurfaced cycle path and others having no cycle provision at all. East Warrington presents a fragmented and ad-hoc cycle network.

Issues

- Cycle infrastructure to key employment sites such as Birchwood Park is inadequate and fragmented.
- The number of commuters using cycling as their main mode of transport is minimal.

Opportunities

- Improving crossing facilities and cycle infrastructure in east Warrington could help raise levels of cycling.
- More tarmac surfaced and segregated cycle routes could be introduced that head towards the town centre in order to help promote cycling as a common mode of travel in Warrington.
- Interventions at Blackbrook Avenue roundabout as a sub-component of Warrington East Phase 2 will see lane widening to allow for the future provision of a pedestrian cycle facility.

9.7 Pedestrian provision in Warrington East

Walking is the simplest and easiest form of transport. For distances under 2km, working is a quick and effective way to travel. For this reason, walking trips often form at least one leg of a multi modal journey. For some residents with no access or limited access to car, public transport or a bike, walking is sometimes the only travel option.

Walking is also a form of active transport and presents limited impacts to the environment, thereby a preferred transport mode as it offers benefits to the user and transport network. Therefore, it is vital to assess the levels of walking in east Warrington.

Similar to public perceptions of cycling in east Warrington, the popularity of walking in east Warrington is limited by the lack of safe and segregated footpaths for users. However, as detailed in Section 8.4.2 a larger number of commuters to east Warrington opt to walk rather than cycle with 4.7% of commuters travelling on foot compared to 2.9% of commuters who travel by bike. This could suggest an appetite for travelling by foot in east Warrington which is repressed by inadequate infrastructure. This further exemplifies the car borne commuter culture which exists within east Warrington.

Issues	Opportunities
• Infrastructure in east Warrington is ill equipped for pedestrians. • East Warrington sees a minimal number of commuters undertaking their commute by foot.	• Warrington East Phase 2 seeks to improve the safety of multiple junctions across east Warrington making journeys undertaken by foot more attractive. • An increase in the number of commuters adopting walking as their main more of transport or a component of their journey would reduce congestion in east Warrington, in tandem lowering pollution levels in the area.

10 How People Travel

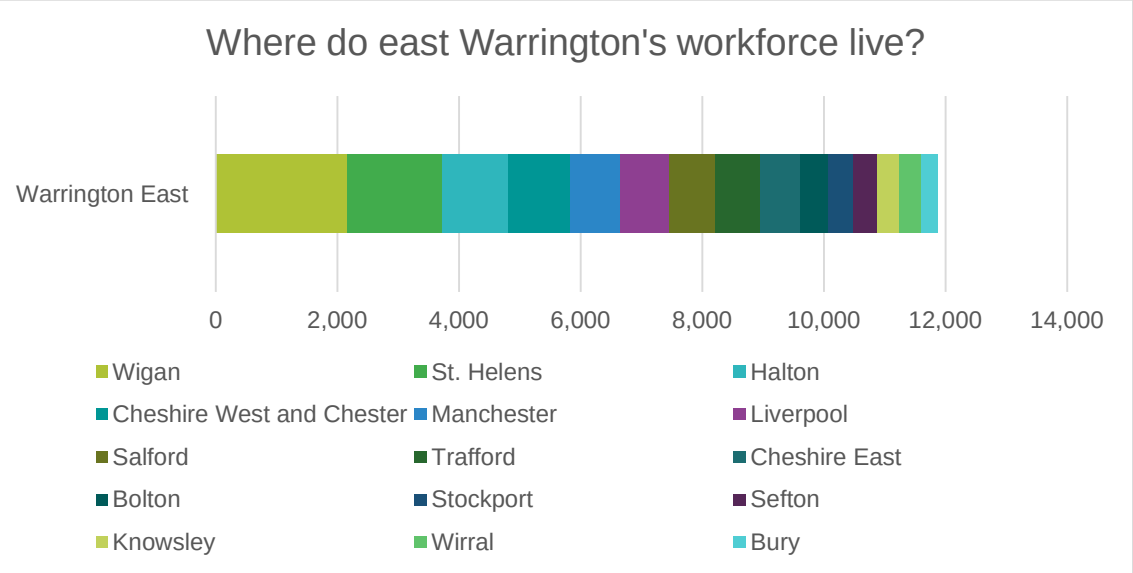
This section explores the travel behavious of those living and/or working within east Warrington to understand the demand on the transport network. Data in this section has been prmarily sourced from the Office of National Statistics.

10.1 Where east Warringtons workforce resides

33, 095 people are employed in east Warrington of those 12, 884 also reside in Warrington, however due to its advantageous strategic connections noted in section 8, the area is able to draw on a wide labour pool across the North West.

Figure 37 below illustrates the top 15 local authority areas where Warrington's workforce live, excluding Warrington itself. It also notes how many commute to east Warrington from each area.

Figure 37: East Warrington's workforce place of residence (2011)

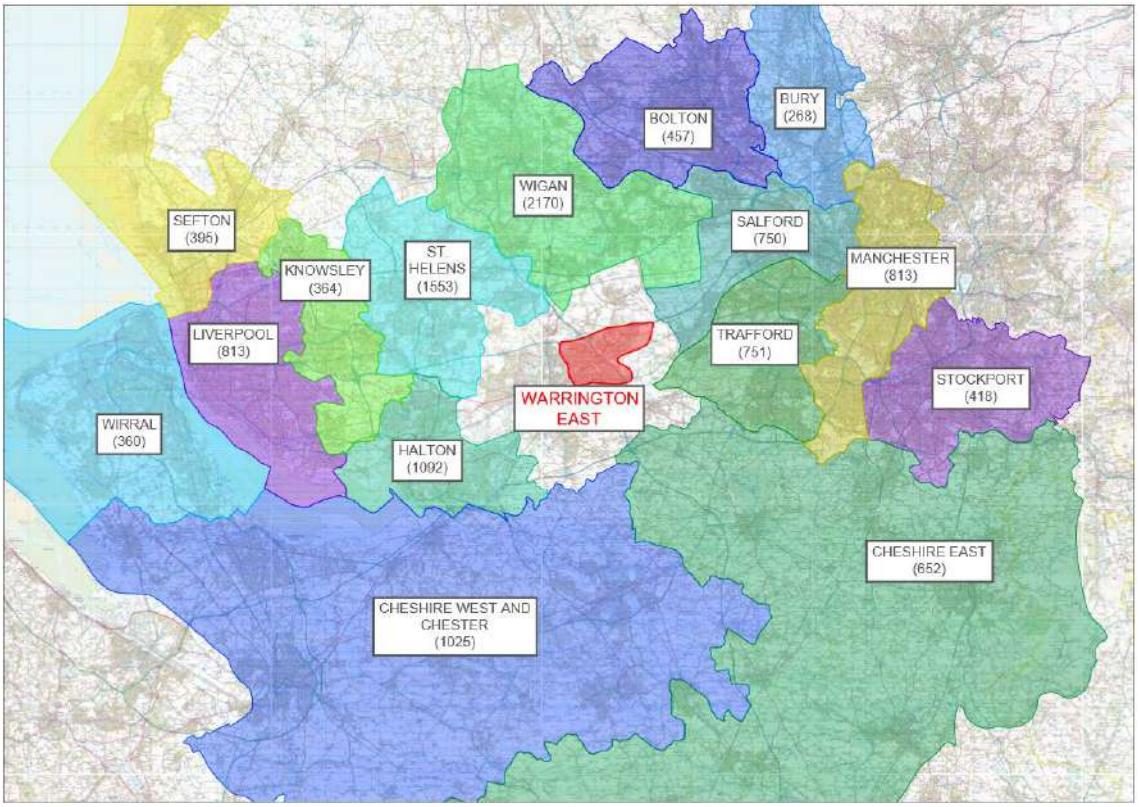


Source: NOMIS

Outside of Warrington itself Wigan is the largest source of labour, with 2,170 of east Warringtons workforce residing there. Greater Manchester also provides a significant proportion of east Warringtons workforce with high numbers of people commuting from Manchester, Trafford, Salford and Bolton.

Figure 38 below displays the 15 local authorities in relation to there distance from east Warrington, illstrating the variety of distances people travel to reach employment in east Warrington.

Figure 38: Where east Warrington's workforce live

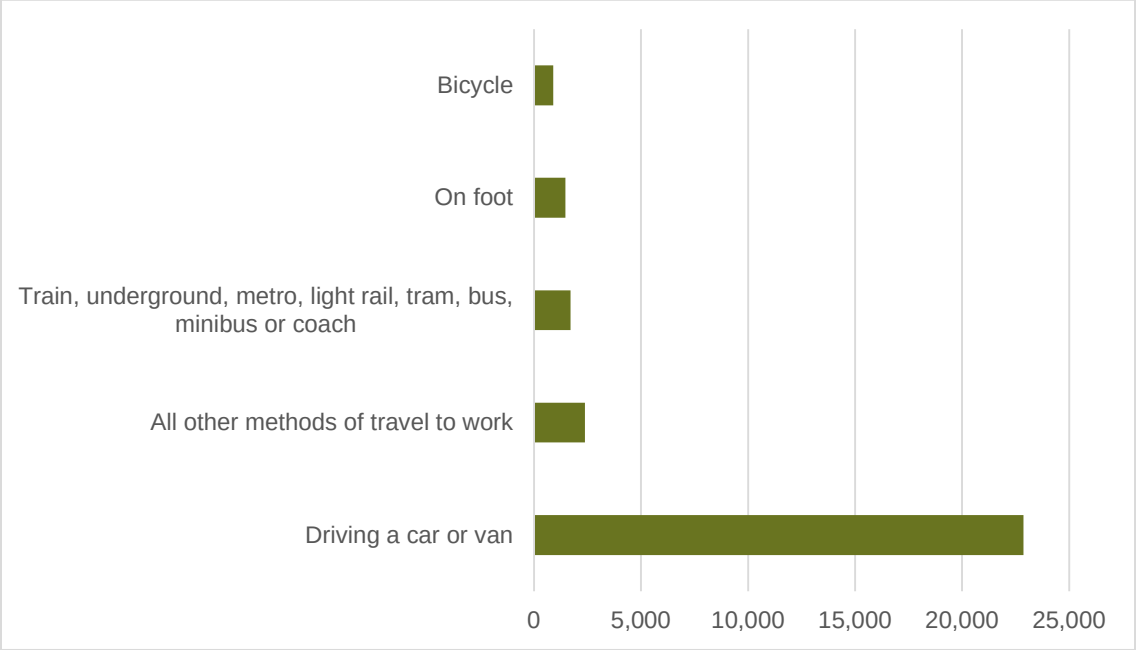


Source: Mott MacDonald

10.2 East Warrington's workforce modal split

Warrington is a town built on car bourne commuting, a trend which east Warrington has not escaped. Instead east Warrington exemplifies this clearly in its commuting patterns. Figure 39 below displays the modal split of east Warrington's workforce.

Figure 39: Modal split of east Warrington's workforce (2011)



Source: NOMIS

East Warrington's prime location near the M6, M62 and links with the rest of the strategic network enable its workforce to commute by car from greater distances in a relatively reasonable travel time. For example, by car people living in Wigan can reach Birchwood Park in just 24 minutes via the M6 and the A574. As such 74% of east Warrington's workforce travels by car or van meaning both the strategic highway network and the local highway network are heavily used.

On average 7.6% walk or cycle to work in east Warrington; with the majority living locally in east Warrington. An even lower proportion favour train or bus services with only 5.5% of commuters use public transport services to travel to east Warrington.

Issues

- The majority of east Warrington's workforce use the highways network to access employment. Most trips are likely to use the strategic network to access employment as east Warrington's workforce resides across the North West.
- Birchwood Way provides the gateway to employment in the east of Warrington. Most of east Warrington's workforce are likely to use this road and associated junctions.
- There is infrequent use of public transport and active travel modes when commuting in east Warrington.
- East Warrington is likely to experience a variety of cross town movements with many of east Warrington's workforce residing in central and inner Warrington.

Opportunities

- Improvements to the highways network, specifically Birchwood Way, has the opportunity to improve journey quality for the majority of east Warrington's workforce and residents.
- Travel undertaken by Public Transport in east Warrington is minimal. Further marketing, infrastructure and route planning could help increase the use of public transport when commuting in and out of east Warrington.
- Active travel remains low in east Warrington. Infrastructure improvements that could help make walking and cycling more attractive and safe could help increase active travel.

So, what does this mean for East Warrington Phase 2?

The majority of east Warrington's workforce and residents travel to work driving a car or van and so there is a heavy reliance on the local highways network.

Due to the dominant role of the car in the area, East Warrington Phase 2 works presents an opportunity to improve and enhance the journey quality for many commuter trips. The scheme would principally reduce congestion and delays at three major network pinch points along Birchwood way.

11 Economy and Business

This section highlights the perfromance of businesses and the economy of east Warrington, focusing primarily on Birchwood Park as the key employment site. Section 6 presents a series of additional business and economic growth issues and opportunities in the wider Warrington area that underpin the emering strategic objectives of the schemes, but this section facuses solely on east Warrington.

11.1 Birchwood Park

Since its opening in 2000, Birchwood Park has grown rapidly, creating an economic base of regional improtance[15]. The Business Park is now home to more than 165 organisations and employs 6,000 people[16] from a diverse professional background. Birchwood Park is set in a desirable and pleasent location in the North West and has become known as a location of science and research excellence.

Figure 40: Birchwood Park

Source: Birchwood Park- www.birchwoodpark.co.uk

[15] Mickledore Economic Strategy-Warrington East

[16] www.birchwoodpark.co.uk

Birchwood Park is a mixed use business park encompassing both old and new stock. These include two multi storey blocks of around 27,870 sqm, a number of former labratory buildings converted to offices, and a range of new office space in several locations. Bridgewater Place is the park's flagship development and consists of five headquarter buildings arranged around a central boulevard, with occupiers such as Rolls Royce, Department of Work and Pensions and GB Oils[17].

11.1.1 Birchwood Park occupants

Birchwood Park accomodates a wide range of businesses from small independent enterprises to large global companies. Examples of the range of businesses which can be found at Birchwood Park include:

- AECOM
- Rolls-Royce
- Arcadis
- Ashley Kneale Consultancy

Additionally, Birchwood Park has a nationally significant nuclear cluster with companies such as AMEC Foster Wheeler, NNL and Nuvia based here. The park is predominantly based around nuclear decomissioning, leading to a strong collaboration with consulting engineering companies such as Atkins Global, benefiting from a close proximity to Sellafield Ltd Engineering Centre in nearby Risley.

11.1.2 Birchwood Park occupancy rates

Despite the growth of the business park, building occupancy rates have declined over recent years with congestion increasingly being anecdotally cited as a key contributing factor in the reduced occupancy rates. Businesses are choosing not to locate or expand in east Warrington resulting in a lack of new investment in the Business Park and an increased level of vacancies in its existing buildings. Discussion conducted by Mott MacDonlads project team with affected commercial property owners and BE group (an economic development and propoerty consultancy that operates across Birchwood) suggests firms have chosen not to locate at Birchwood Park due to congestion concerns, acessibility issues and inadequate public transport connections. Recent examples include:

- Phonak - cited traffic concerns as a reason for not locating its 35,000 sq ft offices in Birchwood Park
- Costain - Considered Birchwood Park as a location for a 60, 000 sq ft office but chose to locate elsewhere due to congestion issues

Warrington East Phase 2 presents an excellent opportunity to address these congestion concerns and enhance connectivity issues between the local and strategic highways networks. This could help Birchwood Park realise its full growth potential, as well as boosting the economic performance of the town and the local economy.

11.1.3 Birchwood Park Sustainable Travel Management Plan

Birchwood Park have independently made a commendable effort to combat the current congestion issue experienced in east Warrington with the introduction of a Sustainable Travel Management Plan. The award winning Travel Management Plan seeks to provide the strategy and actions which will facilitate travel to and from the Birchwood Business Park in a sustainable

[17] Mickledore- East Warrington Economic Strategy

and environmentally responsible way. By using the travel plan to support and influence the travel behavious of those on site, Birchwood Park will achieve[18]:

- Better road use, resulting in better journey times, allowing for continued growth of businesses on site
- Improved air quality, further enhancing the site as an enjoyable workspace
- Enhanced employee experience, reinforcing the site as the best place to work
- A framework for reviewing and planning travel in the future

The package of measures which make up Birchwood Park's Travel Plan are outlined in the schematic below:

Despite the positive ambitions of the Birchwood Park Sustainable Travel Management Plan congestion is worsening on the approaches to Birchwood Park, particularly along the A574 Birchwood Way corridor indicating highways intervention is necessary to combat the current issue congestion problem surrounding Birchwood Park.

11.2 Birchwood Boulevard

Birchwood Boulevard sits between the M6 and Birchwood Shopping Centre and includes 41 self contained offices developed over a 20 year period. Occupants here come from a wide range of employment sectors inlcuding Manufacturing, Information and Communication and Administrative and Support Service activities. Despite the diverse range of occupants, some buildings are limited in design and specification and have been neglected over recent years leaving some office space virtually unlettable. As a result of the poor condition of the space at Birchwood Boulevard and the prevalent congestion issues surrounding the site vacancy rates

[18] Travel Plan- www.birchwoodpark.co.uk

here have increased and currently 30.3% of the total floorspace is vacant; this is the highest percentage in east Warrington[19].

Issues

- Congestion has been cited as a deterrent from investment in east Warrington by multiple companies.
- Birchwood Park has introduced a Sustainable Travel Management Plan to reduce the number of employees using the local highways network however the congestion problem is worsening indicating that intervention is necessary.
- Regular congestion on the main access routes to east Warrington's key employment sites create an unpleasant travel experience for employees here with unpredictable journey times and long delays.
- East Warrington's local highways network is unable to cope adequately with current demand, particularly at peak commuting hours. Planned development here will exacerbate the problem further.
- Vacancy rates of commercial sites in east Warrington have recently increased.

Opportunities

- East Warrington has a large consulting engineering base which provides services to other industries including water, transport, infrastructure and other forms of energy. As a result, the east Warrington economy is likely to benefit from any uplift in infrastructure expenditure if it equips the area to deal with expansion.
- Warrington East Phase 2 will enable the main access routes into east Warrington's key employment sites to cope with current and future user demand.
- Reduced congestion on the network will improve journey ambience for commuters to east Warrington, encouraging expansion of the work force in accordance with planned development of the employment centres here.

So, what does this mean for Warrington East?

The congestion issue surrounding east Warrington's key employment sites is reducing attractiveness to investors as they see little opportunity for expansion due to a transport network which is unable to cope with demand at present before any further development.

Warrington East Phase 2 will seek to provide additional capacity to accommodate demand whilst ensuring effective traffic management by the modification of key junctions. The scheme will facilitate the release of land for housing and commercial development through provision of a safe reliable and well-connected transport network making the area appear an attractive site of investment again.

[19] Mickledore- East Warrington Economic Strategy

12 Land Use and Development

This section provides an overview of future land use and development opportunities within east Warrington. The section highlights the issues and opportunities which may arise as a result of proposed development here, both commercial and residential and what this may mean for the transport network.

12.1 Sites of change and opportunity

Warrington Borough Council's Local Plan core strategy outlines 4 key sites within east Warrington as areas of change and opportunity over the next decade[20]:

- Birchwood Park: The area provides an established premier business location for the borough and sub-region and is home to elements of the UK nuclear industry. The area benefits from a high quality of design and a diverse range of services that support the attracitveness and sustainabiltiy of the park. There are further opportunities in the park to capitalise on this successful location.
- Woolston Grange: The area was one of the first purpose built employment areas constructed under the New Town powers and is a key location for warehousing and distribution. There are opportunities to incrementally improve the exisiting environmental quality and accessibility for sustainable transport modes that contribute to the provision of walking and cycling in the area.
- Woolston Hub: The hub development at Woolston was the boroughs first completed neighbourhood hub and incorportates leisure facilities, library services, GP surgery and Children's centre. The hub should continue to provide a focus for community facilities in the neighbourhood.
- Woolston Park: The park covers 23 hectares and follows the course of Spittle Brook. There is an opportunity to enhance the quality and function of the exisiting park whilst also linking to exisiting green space corridors for both leisure and sustainable transport.

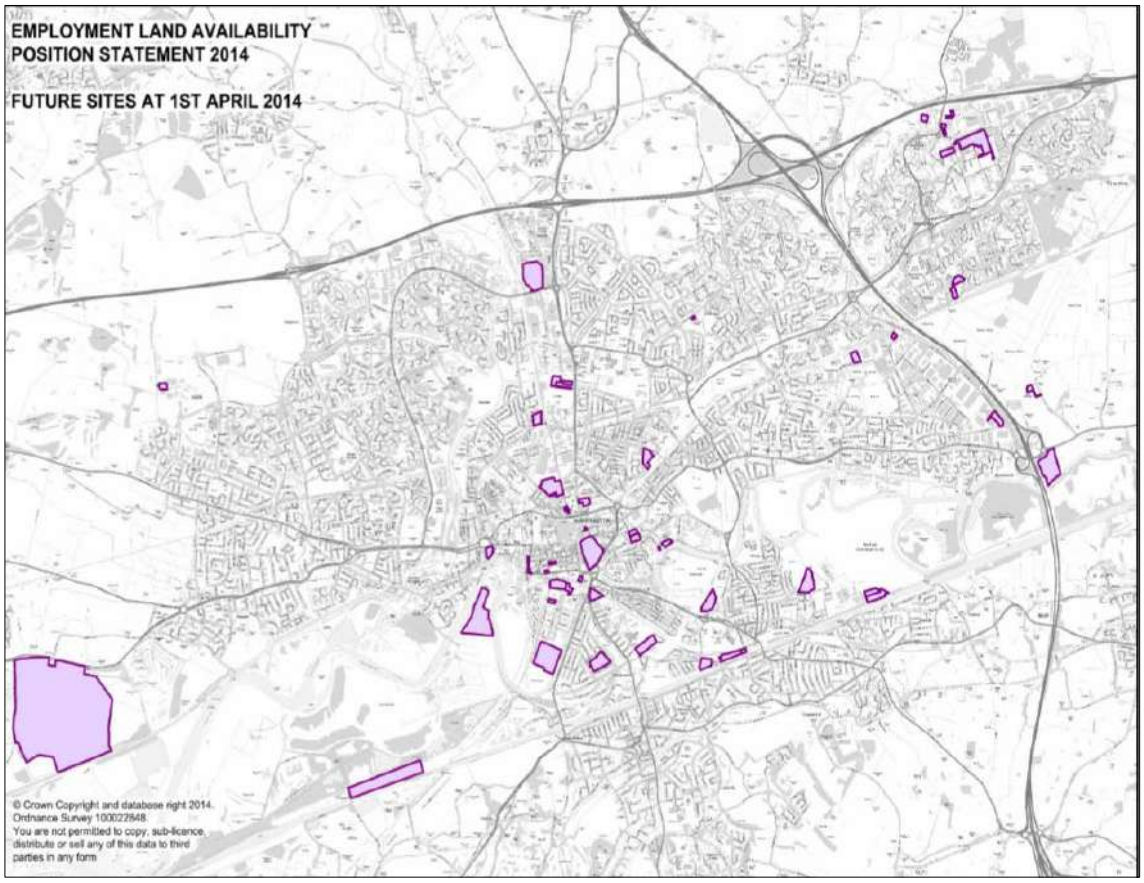
12.2 Future employment land development

East Warrington has a thriving economy, but in order to ensure its ongoing success in an increasingly competitive environment, measures need to be put in place to enable it to maintain its strong position in relation to increasingly competing locations such as Daresbury Park and Airport City.

Figure 41 below displays the sites of proposed employment land development across the whole of Warrington. East Warrington is seen to present a significant proportion of the proposed employment sites, particualry around the Birchwood Park area.

[20] Warrington Borough Council- Adopted Local Plan Core Strategy

Figure 41:Future employment sites at 1st April 2014 across Warrington



Source: Warrington Borough Council- Employment Land Position Statement

12.3 The growth potential of Warrington East Phase 2

The spare capacity and type of development that remains to be built within Birchwood Park is known. Warrington East Phase 2 has the potential to bring forward two of these undeveloped sites at Birchwood Park. The anticipated growth as a direct result of Warrington East Phase 2 at theses two sites has been determined by consultation with WBC and subsequent modelling undertaken by Mott MacDonald. The details of these sites can be seen in Table 10.

Table 10: Birchwood Park development sites

Site name	Floor Space	Land Use
The Quadrant	12, 225	B2/B8
Site 381	72, 089	B2/B8

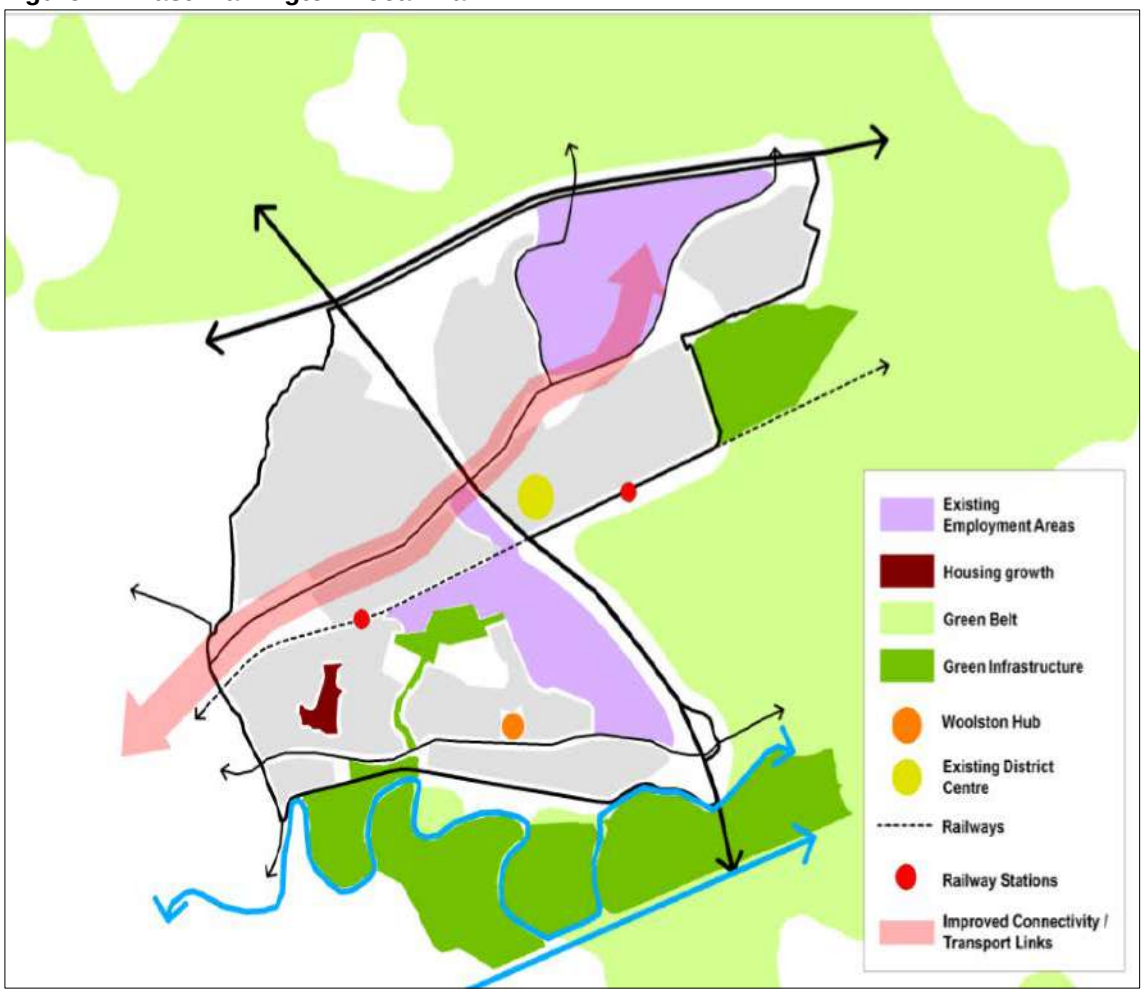
Source: Mott MacDonald

The scheme has the potential to bring forward significant development in east Warrington. Warrington East Phase 2 will accomodate the increased demand which will be created by this additional development alongside reducing delays and queing and improving journey times compared to the present day situation.

12.4 Housing

The inextrincable link between housing and employment has made east Warrington an extremly attractive site for residential development in the wake of the booming employment sector located here. Figure 42 below, highlights the key site of housing growth anticipated in east Warrington and its proximity to the A574.

Figure 42: East Warrington Local Plan



Warrington Borough Council- Local Plan Core Strategy

Warringtons overarching 15-year period housing plan has identified 249 sites which have been deemed appropriate for residential development. Of this total number 32 are located in east Warrington. Within these 32 identified sites there is a potential net capacity of 618 dwellings which could be delivered by 2027[21]. The construction of 10.5% of the boroughs housing supply, solely within east Warrington has the potential to significantly change the current demographics of the area.

Table 11 displays a broad overview of Warringtons 2012 Stategic Housing Land Availability Assessment (SHLAA), indicating the proportion of the overall housing supply which is expected to be delivered within east Warrington.

[21] Mikledore- Warrington East Economic Strategy

Table 11: Expected housing supply in east Warrington

Type	Warrington East			Warrington Borough	
	Yield	% of Warrington East	% of Warrington Borough	Yield	% of Warrington Borough
Suitable, Available and Achievable	505	81.7	8.6	4,944	84.0
Suitable, Likely to become available and achievable	113	18.3	1.9	941	16.0
Total	**618**	**100.0**	**10.5**	**5885**	**100.0**
Short Term	247	40.0	4.2	2765	47.0
Medium Term	131	21.2	2.2	1558	26.5
Long Term	240	38.8	4.1	1562	26.5
Total	**618**	**100.0**	**10.5**	**5885**	**100.0**
Previously Developed	425	68.8	7.2	4987	84.7
Greenfield	193	31.2	3.3	727	12.4
Mixed	0	0	0	171	2.9
Total	**618**	**100.0**	**10.5**	**5885**	**100.0**

Source: Mickledore 2014- Warrington East Economic Strategy

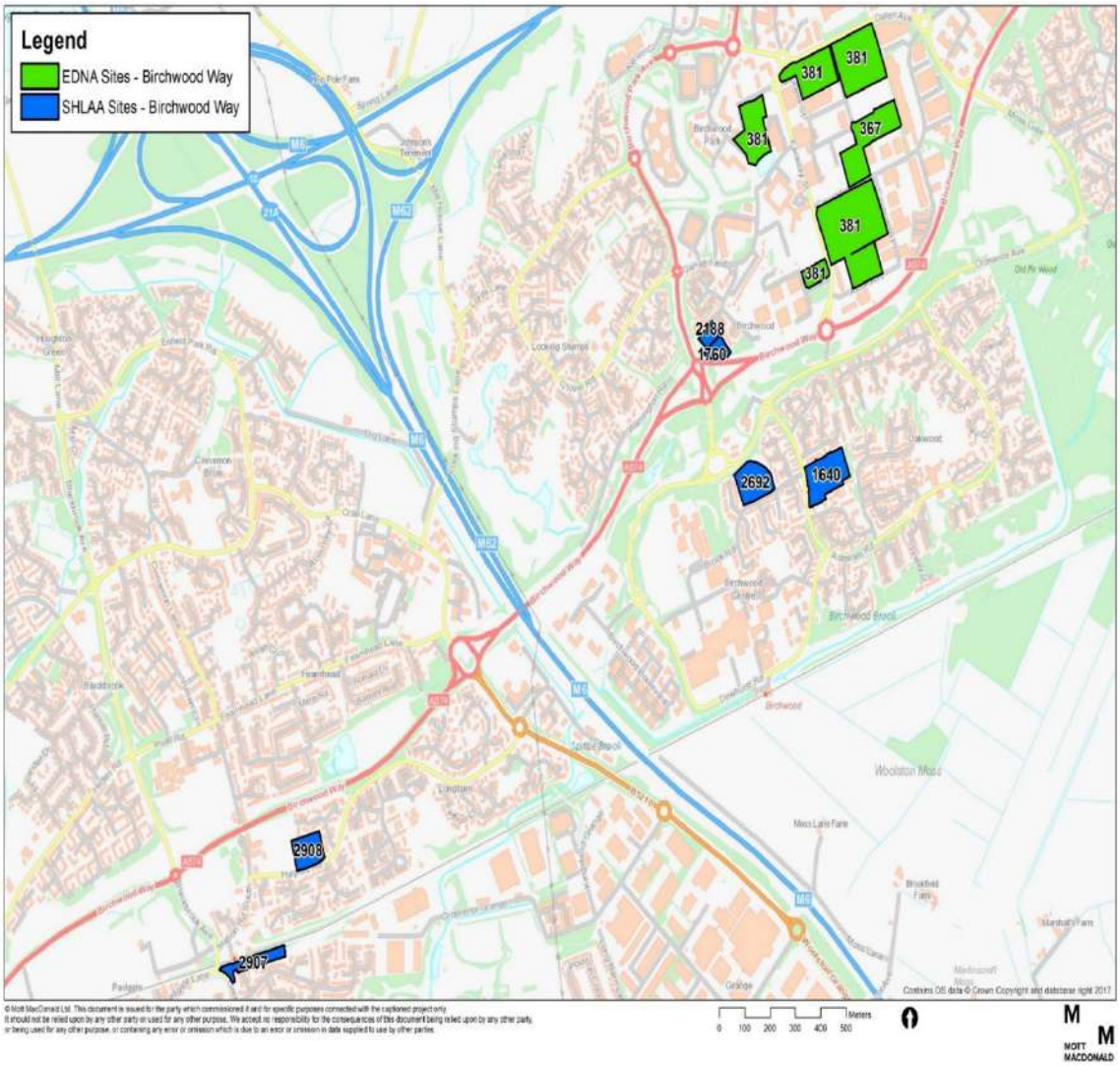
Warrington East Phase 2 is anticipated to directly impact six available housing sites, with a total capacity of 230 dwellings. These six sites can be seen below in blue, in Figure 43 alongside their position in relation to the proposed 381 EDNA employment development sites noted in green. Table 12 provides the SHLAA site number of each site and the respective capacity of each site.

Table 12: SHLAA housing site references

SHLAA Reference	Capacity
2188	8
1760	9
2692	23
1640	66
2908	93
2907	31
Total	230

Source: SHLAA

Figure 43: East Warrington housing sites



Source: Mott MacDonald

The A574 provides the main access route to all six of these sites anticipated as a direct result of Warrington East Phase 2 and a large proportion of the sites identified in Figure 42. Increased demand on a local highways network already exceeding capacity will undoubtedly have a detrimental impact without intervention.

Issues

- The wards expected to provide the largest proportion of east Warrington's housing developments are Birchwood and Poulton South. Alarmingly, the A574 provides the main access route to both of these areas.
- An increased number of road users on the local highway network will exacerbate the current congestion issue.

Opportunities

- Warrington East Phase 2 will provide additional capacity to accommodate the increasing number of road users created by future housing developments.
- Increased housing supply within east Warrington may reduce the number of people who commute to the area for employment from destinations further afield. Shorter commuter distance could make active travel a more attractive option with the provision of the necessary infrastructure.

So, what does this mean for Warrington East Phase 2?

Future development focused in east Warrington will significantly increase user demand on the transport network, with particular pressure being placed on the A574.

Warrington East Phase 2 will increase capacity and improve access to residential and commercial development sites helping to improve their attractiveness to potential investors, supporting the continued growth of east Warrington.

13 Summary of Problems and Opportunities

Wider Warrington	Issues	Opportunities
	• Warrington has excellent strategic connections, including advantageous access to the M6 growth corridor. However, the growing congestion issue has resulted in Warrington being viewed as a less attractive place, reducing its ability to capitalise on its strategic highway connectivity. • Despite Warrington being embedded within an excellent rail network, the delays associated with the onwards journey to east Warrington reduces its attractiveness as a travel option. • Warrington is unable to fully capitalise upon its freight links due to inefficient highways connectivity for the 'last mile' delivery of goods to distribution and manufacturing centres. • Warrington is a significant town within the Northern Powerhouse concept but is currently unable to adequately provide the necessary transport connectivity to tackle poor supply chain linkages and raise employment rates.	• Improvements to the local highways network in east Warrington will enable the area to access the benefits of the M6 growth corridor including the prevention of highways degradation. • Warrington Bank Quay sits on the prospective HS2 and NPH rail lines. Effective ongoing connectivity to the highways network will allow Warrington to become an economic hub within the rail network bringing numerous economic opportunities to the town. • Warrington is advantageously positioned in terms of access to both Liverpool and Manchester Airports. Improved connectivity between Warrington and both airports has the potential to open the town to investment from international markets. • Warrington East Phase 2 presents an opportunity to reduce congestion at a major gateway into Warrington and its thriving businesses, allowing the area to seize the opportunities presented as a result of the growing Northern Powerhouse Concept and the Atlantic Gateway.

Socio-economic	Issues	Opportunities
	• East Warrington could be at risk from rising traffic delays with rising population. There are further environmental implications with rising vehicular pollution. • Employment has been growing in east Warrington over the past five years and is anticipated to continue to do so, presenting increased pressure on the road network at peak commuter hours. • The demand to travel to these employment sites will be greater. There needs to be consideration of how people travel to work, with assurance that the highways network remains operational. • There is a car commuting culture in east Warrington at present. There should be appropriate intervention to encourage a modal shift away from the private car to help further sustainable development.	• A greater number of people living in east Warrington will create greater demand to buy products and use local services resulting in growth in the local economy. • East Warrington sees a larger proportion of people working in professional, scientific, and technical activities compared with the national average. Increased employment within these sectors presents the opportunity to excel east Warrington as a destination of excellence in science and industry. Thereby attracting more jobs, employment opportunities and boosting the local economy. as well as administrative and support services. • These sectors are set to grow with the expansion of Birchwood Park and the expansion of existing facilities within a close proximity such as Sci- Tech Daresbury, Omega, Warrington Waterfront and Port of Warrington. • Increased employment within these sectors presents an opportunity to excel east Warrington as a destination of excellence in science and industry. Thereby attracting more jobs, employment opportunities and boosting the local economy.

Strategic Highways Network	Issues	Opportunities
	• Congestion is regularly experienced at the M62 J11 due to queueing onto the A574 at peak times. • Congestion at M62 J11 is adversely impacting the wider strategic network with queues at J10 (Croft) being directly linked with the congestion experienced at J10 as a result of congestion on the A574 as traffic exits at J11.	• Improved and more reliable access to Birchwood will reduce congestion at the M62 J11 and J10 Croft which consistently experiences long delays at peak hours, partially as a result of the demand for M62 J11. • Reduced congestion at the M62 J11 could improve journey reliability times for both people and goods, further improving network resilience. • Additional capacity along the A574 will reduce queueing on the M62 J11 slip road.

Local Transport Network	Issues	Opportunities
	• The A574 is the main access route into east Warrington and the Birchwood employment hub-Birchwood Park. The corridor is nearing capacity. If flow increases, the road could become increasingly congested and incident prone. • Regular congestion could have a detrimental effect on economic productivity within east Warrington and make travelling unpleasant. • The rail station is within walking distance of east Warrington's major employment destination- Birchwood Park. However, the connecting trip on foot still remains quite long and segregated paths are inconsistent. This may act as a barrier to the use of rail stations in the area. • Bus travel in east Warrington is minimal despite local services being frequent and having a good geographical coverage. • Infrastructure in east Warrington is ill equipped for active travel, limiting uptake.	• Improvements to the A574 Birchwood will ease congestion and bolster the resilience ensuring east Warrington's residents and workers can continue to travel in the without excessive delay. • Congestion was reported as a key constraint for new businesses locating to east Warrington. Reducing congestion and existing network delay along the A574 could help improve network resilience. In tandem this could help raise the business occupancy level within east Warrington and fill existing vacant office space as east Warrington becomes viewed as a more attractive location. • Birchwood rail station offers fast connections to Liverpool and Manchester and a car park which can accommodate 39 cars. With improved road and pedestrian access to the station the site could become a key park and ride destination, facilitating journeys further afield. • Addressing a number of key network pinch points along Birchwood Way could help enhance bus services travelling along the highway. An increase in bus patronage could reduce current pollution and congestion levels in east Warrington, facilitating a more sustainable transport network here. • Improving crossing facilities and provision for cycling facilities in east Warrington could help raise levels of walking and cycling. An increase in the number of commuters adopting active travel as a main mode of transport could reduce congestion in east Warrington, in tandem lowering pollution levels in the area. • Interventions at Blackbrook Avenue roundabout as a sub-component of Warrington East Phase 2 will see lane widening to allow for the future provision of a pedestrian cycle facility.

How people travel	Issues	Opportunities
	• 74% of east Warrington's workforce use a car or van to commute to work. Birchwood Way provides the gateway to employment in the east of Warrington. Most of east Warrington's workforce are likely to use the road and associated junctions. • There is infrequent use of public transport and active travel modes when commuting in east Warrington.	• Improvements to the highways network, specifically Birchwood Way, has the opportunity to improve journey quality for the majority of east Warrington's workforce and residents. • Travel undertaken by Public Transport is minimal. Further marketing, infrastructure and route planning could help increase the use of public transport when commuting in and out of east Warrington. • Infrastructure improvements that would help make walking and cycling more attractive and safe could help increase active travel.

Economy and Business	Issues	Opportunities
	• Congestion has been cited as a deterrent from investment in east Warrington by multiple companies. As a result, vacancy rates have increased. • Birchwood Park has introduced a Sustainable Travel Management Plan to reduce the number of employees using the local highways network however the congestion problem is worsening indicating that intervention is necessary. • Regular congestion on the main access routes to east Warrington's key employment sites create an unpleasant travel experience for employees here with unpredictable journey times and long delays. Planned development here will exacerbate the problem further.	• Warrington East Phase 2 will enable the main access routes into east Warrington's key employment sites to cope with current and future user demand. • Reduced congestion on the network will improve journey ambience for commuters to east Warrington, encouraging expansion of the workforce in accordance with any planned development of the employment centres here. • East Warrington has a large consulting engineering base which provides services to other industries including water, transport, infrastructure and other forms of energy. As a result, the east Warrington economy is likely to benefit from any uplift in infrastructure expenditure if the area is equipped to deal with expansion.

Land Use and Development	Issues	Opportunities
	• The wards expected to provide the largest proportion of east Warrington's housing developments are Birchwood and Poulton South. The congested A574 provides the main access route to both of these areas. • An increased number of road users using the local highway network will exacerbate the current congestion issues.	• Warrington East Phase 2 will provide additional capacity to accommodate the growing number of road users created by future housing developments. • Increased housing supply within east Warrington may reduce the number of people who commute to the area for employment from destinations further afield. Shorter commuter distance could make active travel a more attractive option with the provision of the necessary infrastructure.

14 Need for Intervention

14.1 Introduction

Having established a firm evidence base on which to establish objectives to guide scheme development and appraisal in Sections 7-12 this section draws the key problems and issues identified in the thematic evidence based review together in a holistic manner to establish a rationale for investment, and specifically for Phase 2 of the Warrington East three phase programme of interventions.

14.2 Future proofing the local network to support growth

East Warrington originally developed as part of the Warrington New Town plan based upon car borne commuting, implementing a distinctive local road network to support this vision, however original plans were never completed.

Although strategically located in close proximity to the M6 and M62 to facilitate longer journeys, there are a very limited number of access points to/ from the strategic network into East Warrington. This in conjunction with incomplete plans for the original local road network has led to congestion at key junctions in the area. Factoring in increased development, the constraints of the local road network and its external access to the wider strategic network have become more acute with congestion and delays worsening.

Coupled with forecast population growth and Warrington's aspirations for continued economic growth, the local highway network will be unable to efficiently cope with increased demand, which will affect Warrington's ability to fulfil its growth ambitions. Indeed, discussion between Mott McDoanld, affected commercial property owners and BE group[22]) suggests firms have chosen not to locate at Birchwood Park, one of the key emplyemnt hubs in east Warrington due to congestion concerns, acessibility issues and inadequate public transport connections.

In order to accommodate projected population growth and its resulting increased commuter traffic, and also ensure that the network is capable of supporting growth in the number of businesses in the area, the network has to be future proofed to be able to cope with existing and forecast demand.

14.3 The impacts of local network congestion on the strategic network

The need for intervention here is not just evident in east Warrington but also the wider strategic transport network. Work undertaken by Mott MacDonald for the Highways Agency (HA) to develop a pilot metering system to be trialled on the M6/M62 Croft Interchange (M62 J10) revealed that some of the congestion experienced at J10 is is caused by queuing from the A574 Birchwood Way. The single carriageway exit onto the A574 Birchwood Way does not provide sufficient capacity for the level of demand causing traffic to block back onto the circulatory carriageway at J11. Consequently, this queue restricts vehicles from entering the roundabout from the westbound slip road.

The wider network impact which congestion in east Warrington is contributing to is further rationale for the need for intervention; left un-addressed the wider area could suffer

[22] An economic development and property consultancy that operates across Birchwood

economically as businesses are deterred not only from investing in east Warrington, but also the wider Warrington area.

14.4 Impact on travel choices

With over 2.6 million people of working age living within a 30-minute drive of east Warrington; it is unsurprising that car transport dominates movement into and out of the area; 74% of east Warrington's workforce commute to the area via car or van. This highlights the importance of addressing congestion within east Warrington and ensuring its road network can accommodate demand.

Buses are currently significantly delayed in the Birchwood area during peak periods due to congestion on the A574 and its associated junctions. This results in large variations in journey times, which acts as a deterrent to potential bus users. Undoubtedly this is a key factor as to why just 5.5% of east Warrington's workforce use public transport to travel to work in east Warrington.

Birchwood Station provides train connections to Liverpool and Manchester; however, it is over 2km to Birchwood Park employment area from the station and the walk takes about 25 minutes, with limited pedestrian crossings and footpaths; cycle lanes in the area are also minimal dtering onward journeys from the station by bike. Congestion dominating the area around Birchwood Way makes multi modal transport using the train and then the bus also unappealing. Consequently, commuters to and from east Warrington tend to opt for unsustainable transport choices.

Whilst economic strategies based on car-borne commuting are currently not viewed as sustainable or attractive for new development sites, east Warrington was originally conceived as an economy to be based on car-borne commuting. To maintain continued economic growth and inward investment in line with that vision, the local network needs to be future proofed, but in a way that supports access by sustainable modes. This in conjunction with highway improvements can also contribute to a reduction in congestion; if commuters, residents and visitors perceive the have a safe and viable alternative to using the car.

14.5 Protecting future development

East Warrington has a thriving economy, but in order to ensure its ongoing success in an increasingly competitive environment, measures need to be put in place to enable it to maintain its strong position in relation places such as Daresbury Science Park and Airport City. Crucial to the continued success of east Warrington will be the ability to open up land for commercial development, allowing the employment sector here to continue to grow, meeting the demand for employment land expressed by investors.

At present, the transport network in place cannot accommodate the demand placed on it, primarily by commuters travelling to employment sites in east Warrington leading to unreliable journey times, poor network resilience and an acute congestion problem. Ultimately this makes the area a potentially unattractive option for further development.

Warrington East Phase 2 seeks to facilitate the release of land for housing and commercial development through provision of a safe, reliable and well-connected transport network. The provision of additional capacity and improved traffic management as part of this scheme presents the opportunity to improve journey times for commuters whilst creating a transport network which is conducive to journey ambience, ultimately promoting the areas reputation as an attractive site for future development.

14.6 Impact of not changing

In establishing the need for the proposed scheme, it is important to consider the counterfactual, that is, what would happen if the status quo was allowed to continue and Warrington Borough Council did not intervene. In not changing, east Warrington runs the risk of experiencing a situation in which journey times are worsened, a spread of peak hour is experienced and network resilience is non-existent as the norm, undoubtedly making east Warrington appear an unattractive site for investment. Insufficient highway capacity to accommodate the release of the proposed scale of development here could impede the economic growth of east Warrington, reversing the positive employment trends which have been experienced over the past decade and lowering demand for housing.

15 Scheme Aim and Objectives

This section sets out the scheme objectives and aims of Warrington East Phase 2. The objectives of the scheme have been formulated through discussion with Warrington Borough Council over the main issues identified in east Warrington, as well as consideration over the growth ambitions for the area and the rest of the Borough.

The policy review in Section 5 and evidence review in Sections 7-14 above confirm the issues which the scheme seeks to address. Therefore, an evidence based objective setting process has been undertaken. This ensures the scheme objectives add true value to the highways intervention scheme.

15.1 Strategic objectives and aims for Warrington East

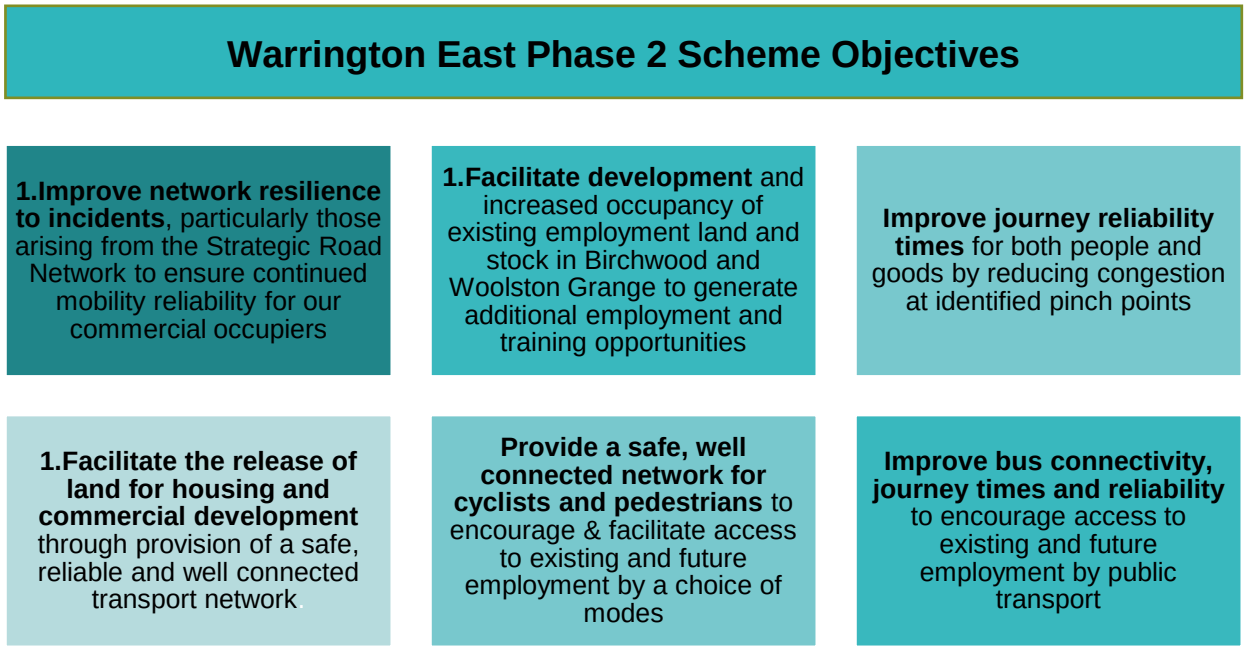
Based on the existing and future issues identified in east Warrington, the overall aim for Warrington East Phase 2 works are:

Key aim of the scheme

Reduce congestion along Birchwood Way to help improve journey quality, foster economic growth and facilitate development and/or raise occupancy of employment. The scheme also seeks to promote Warrington as a place where people want to live and work.

A set of strategic objectives have been identified for Warrington East Phase 2 in order to achieve the aim of the scheme. These objectives provide overarching direction and are set out below:

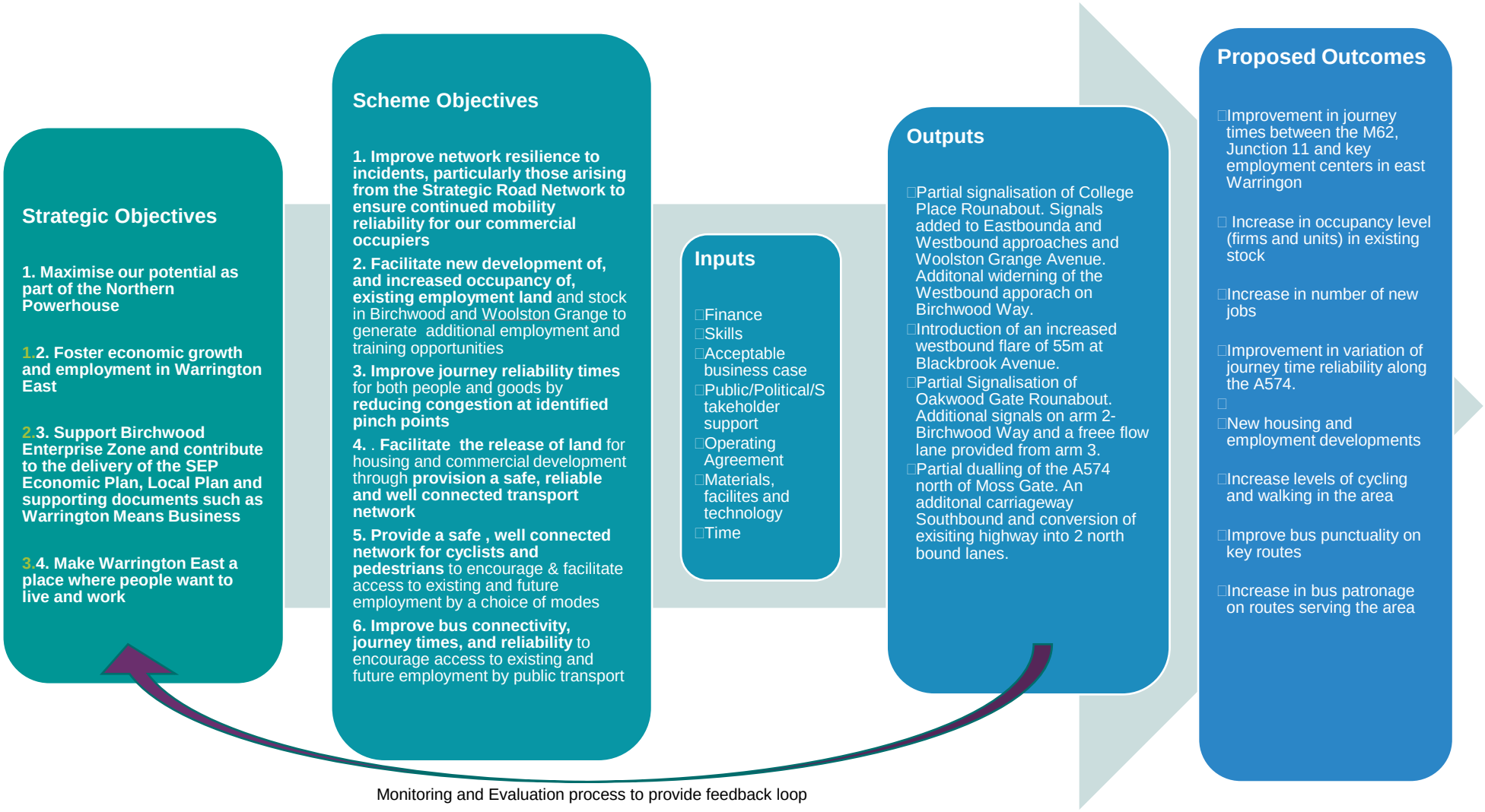
A set of more specific and measurable scheme objectives have also been produced which support achieving the strategic objectives. These are shown below.



15.2 Scheme logic map

The delivery and expected benefits of the Warrington East Phase 2 scheme are demonstrated on the next page in a process map. Here, the causal pathway between the Strategic objectives, Scheme objectives, the inputs required to deliver tangible outputs and the expected outcomes as a result of the investment are shown.

Figure 44: Warrington East Phase 2 Process Map



Source: Mott MacDonald

15.3 Measures for success

In order to establish whether objectives have been achieved, a Monitoring and Evaluation Plan has been developed (Appendix I) that sets out how outcomes associated with successful achievement of objectives will be measured. A summary of this plan is included in the Management Case but the key performance indictors by which success of each of the objectives is shown here:

Table 13: Measures of success

Scheme Objective	Outcome	Performance indicator
Improve network resilience to incidents, particularly those arising from the Strategic Highway Network to ensure continued mobility reliability for our commercial occupiers	• Improvement in journey times along Birchwood Way • Improvement in journey times from Fearnhead to Birchwood Park. • Journey times along Local Network is no faster than journey times on Strategic Network	• A percentage reduction in travel times when travelling along Birchwood Way • A percentage reduction in travel times when travelling between Fearnhead to Birchwood Park. • A percentage reduction in travel times from the M62 into Warrington East
Facilitate new development of, and increased occupancy of, existing employment land and stock in Birchwood and Woolston Grange to generate additional employment and training opportunities	• Improved access to employment at training opportunities in Birchwood and Woolston Grange	• Increase number of jobs • Increase in occupancy level (firms and units) in existing stock • GVA
Improve journey reliability times for both people and goods by reducing congestion at identified pinch points	• Improvement in reliability of journey times along the corridor. • Reduction in congestion and delays at key pinch points along the corridor	• A reduction in variability of journey times when travelling along the corridor • A percentage reduction in highways travel times when travelling along the corridor. • Reduction in queues at key pinch points • Key pinch points along the corridor operating within or below operating capacity
Facilitate the release of land for housing and commercial development through provision a safe, reliable and well-connected transport network	• Improved access to land available for housing and commercial development	• Number of planning applications submitted for residential and employment sites. • Number of new housing and employment developments
Provide a safe, well connected network for cyclists and pedestrians to encourage & facilitate access to existing and future employment by a choice of modes	• Increase levels of cycling and walking in the area	• A percentage increase in the number of people walking and cycling in Warrington East
Improve bus connectivity, journey times, and reliability to encourage access to existing and future employment by public transport	• Improve bus punctuality on key routes • Increase in bus patronage on routes serving the area	• A percentage increase in passengers on key routes along the corridor • Reduction in bus travel times on services serving the area • A percentage decrease in bus timetable delays

Source: Mott MacDonald

15.4 Scope

The scope of the scheme has been defined based on the objectives of the scheme which have been developed based on the problems and opportunities identified in both east Warrington and the wider Warrington area. Given the transport problems identified in Birchwood and Woolston, Warrington Phase 2 works presents an opportunity to enhance strategic and local connectivity in east Warrington. The scheme also has the opportunity to further economic growth and productivity in one of Warrington's and the North West's most crucial employment locations.

The scope of the Warrington Phase 2 works is defined as highways interventions to increase capacity and reduce congestion at three primary locations along the A574 corridor:

- College Place Roundabout
- Oakwood Gate/Birchwood Way Roundabout
- Moss Gate/A574 Partial Dualling

Additional modification to Blackbrook Avenue Roundabout is also required as a direct consequence of the improvements at College Place roundabout.

In the next section, a number of variations for highways intervention have been put forward for each of these locations.

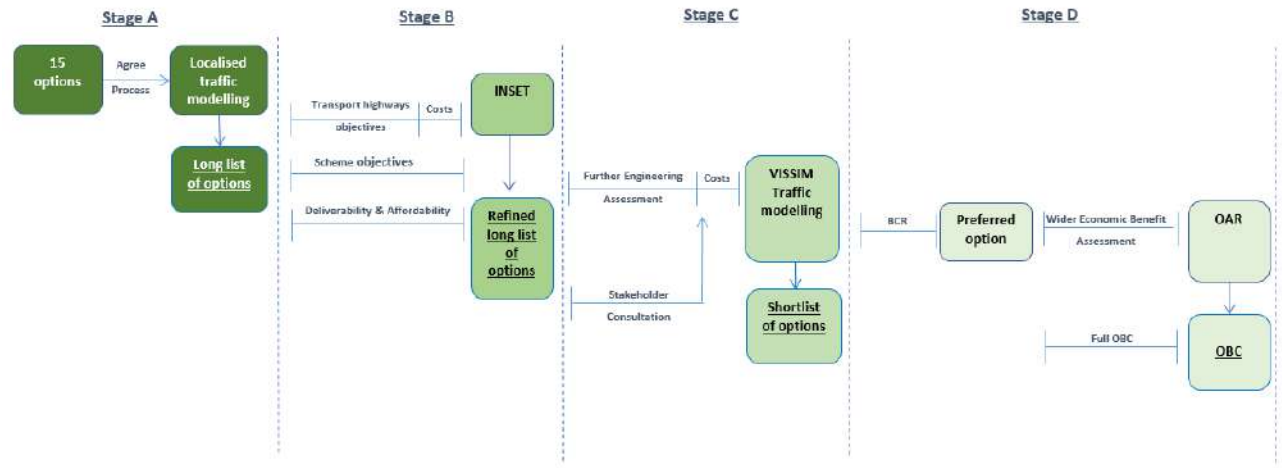
16 Options Development and Appraisal

Following identification of key issues and opportunities and the establishment of the objectives, a range of options were produced for the Warrington East Phase 2. The development and appraisal of these options are described in greater detail in the Options Appraisal Report (OAR) in Appendix A but this section sets provides a summary of the process of how options were developed.

16.1 Options appraisal process

To develop and assess option for Warrington East Phase 2 we developed a four-stage process (Stages A-D) that broadly aligns with the Department for Transport's guidance 'The Transport Appraisal Process' which provides detailed guidance on appraisal and the requirements needed for transport intervention. This process is shown in Figure 45.

Figure 44: Options assessment framework



Source: Mott MacDonald

16.1.1 Stage A process and appraisal results

Stage A involved the development of a long list of options for each of the three identified sites:

- College Place Roundabout
- Oakwood Gate/Birchwood Way Roundabout
- Moss Gate; A574 Birchwood Way Partial Dualling

A summary of the initial options is presented in Table 14. Further detail on these are presented on the accompanying OAR.

Table 14: Long list of options

Location	Option	Scheme Description
College Place Roundabout	Do Nothing	Existing roundabout is unchanged, with all arms as give way entries.
	Do Something 1	Partial Signalisation: provision of signals on Birchwood Way westbound and on the Woolston Grange Avenue approach to the existing roundabout.
	Do Something 2	New Partial Signalised Roundabout: new roundabout with signal controls on the east and south entries and dedicated left turn free flow lane from north to east. Signals at Fearnhead Lane at its junction with Crab Lane also included.
	Do Something 3	Signalised Junction: roundabout replaced with 4 arm signal controlled junction with restricted movements (Left in/ Left out) on the northern arm. Signal control provided at the Fearnhead Lane/Crab Lane junction.
	Do Something 4	Signalised Junction: roundabout replaced with 4 arm signal controlled junction as with Do Something 3, but this time with full movements on all arms.
	Do Something 5	Partial Signalisation: provision of signals on the Birchwood Way East, Woolston Grange Avenue and Birchwood Way West entries to the existing roundabout; with three lane entry from the east and road widening from the west.
	Do Something 6	Grade Separated Junction: provision of signal controls on two lane slip road only and a two-lane flyover for two-way traffic along Birchwood Way.
	Do Something 7	Grade Separated Junction: existing roundabout with dual carriageway flyover for south to east right turn flows.
Oakwood Gate Roundabout	Do Nothing	Existing roundabout is unchanged.
	Do Something 1	Partial Signalisation: Existing roundabout with additional signals provided on the eastern entry.
	Do Something 2	Free flow lane provided from Oakwood Gate to Birchwood Way West to alleviate the congestion on the southern arm.
	Do Something 3	Partial Signalisation: Existing roundabout with additional signals provided on the eastern entry and free flow lane provided from Oakwood Gate to Birchwood Way West to alleviate the congestion on the southern arm.
A574 Birchwood Way Dualling (Moss Gate to M62 J11)	Do Nothing	This is currently a wide single carriageway with central hatching.
	Do Something 1	Partial Dualling: dualling of a section of the of the A574 Birchwood Way to the north of Moss Gate signalised junction.
	Do Something 2	Full Dualling: provision of a dual carriageway between Moss Gate signal junction and M62 J11, to include signalising a number of approaches at the M62 J11.

Source: Mott MacDonald

Following the generation of a long list of options an initial sift was undertaken to assess whether or not an option could successfully improve junction capacity to a level below the congestion threshold at set points in the future. This initial sift was undertaken through the application of localised traffic modelling, specifically JUNCTIONS 8 which combines PICADY & ARCADY modelling packages and LINSIG. Options were not progressed to the next stage of appraisal when:

- A design option was proven to be over capacity in the AM or PM peak;
- Modelling outputs for design options were interpreted to be higher than a C level of service at priority junctions or roundabouts;
- Design options at signalised junctions had a practical reserve capacity less than 20%.

This process is detailed further in the OAR.

16.1.1.1 Stage A option sifting results

Table 15 summarises the options that passed the Stage A assessment process, resulting a refined, shorter 'long list'. Do Nothing options were taken forward as default to enable assessment of options against the status quo.

Table 15: Options taken forward to Stage B options assessment

Location	Option	Scheme Description	Outcome
College Place Roundabout	Do Nothing	Existing Roundabout with all arms as give way entries.	Taken forward to Stage B
	Do Something 1	Partial Signalisation: Provide signals on the Birchwood Way East and Woolston Grange Ave entries to the existing roundabout; with two lane entry from the east.	Taken forward to Stage B (as a Do Minimum option)
	Do Something 5	Partial Signalisation: Provide signals on the Birchwood Way East, Woolston Grange Ave, and Birchwood Way West entries to the existing roundabout; with three lane entry from the east and realignment approach from west.	Taken forward to Stage B
	Do Something 6	Grade Separated Junction: Test of signal control on two lane slip road only, assuming a two lane ahead flyover from E-W/W-E.	Taken forward to Stage B
Oakwood Gate Roundabout	Do Nothing	Existing dogbone shaped roundabout with signal control on the western entry only.	Taken forward to Stage B.
	Do Something 2	Free flow lane: Free flow lane provided from Oakwood Gate to Birchwood Way West to alleviate the congestion on the southern arm.	Taken forward to Stage B.
	Do Something 3	Partial Signalisation: Existing roundabout with additional signals provided on the eastern entry and free flow lane provided from Oakwood Gate to Birchwood Way West to alleviate the congestion on the southern arm.	Taken forward to Stage B.

Location	Option	Scheme Description	Outcome
Moss Gate/A574 Birchwood Way Partial Dualling	Do Nothing	Wide single carriageway with central hatching. Widening for approximately 60m to provide an additional entry lane to the motorway roundabout, M62 J11.	Taken forward to Stage B.
	Do Something 1	Partial Dualling: Section of A574 Birchwood Way to be dualled north of Moss Gate junction.	Taken forward to Stage B.
	Do Something 2	Full Dualling: Provision of a dual carriageway between Moss Gate signalised junction and M62 J11, to include signalising a number of approaches at the M62 J11.	Taken forward to Stage B.

Source: Mott MacDonald

16.1.2 Stage B process and appraisal results

The second sift of options for the three intervention sites at Stage B involved a more complex assessment that looked at option performance relative to a wider range of criteria that went beyond the ability to improve capacity and reduce delay at the junction sites.

The assessment process used Mott MacDonald's Investment Sifting and Evaluation Tool (INSET). INSET is a decision support toolkit developed in-house by Mott MacDonald. INSET uses a set of assessment themes, criteria, and where warranted sub-criteria, to appraise each of the design options. The themes and criteria are weighted according to relative importance and are then options are scored according to how well they meet the criteria. A 5-point scoring system was adopted for Warrington East Phase 2 using a scale of -2 to +2, where -2 represented a very negative ability to address criteria and +2 a very positive one. A more detailed account of INSET's functionality is provided in the OAR.

Scoring was based upon findings of engineering assessments, modelling outputs and initial stakeholder feedback. The assessment was then carried out by a range of Mott MacDonald staff with extensive experience and knowledge with the Warrington East Phase 2 scheme, the geographic area and INSET as an appraisal tool.

Two assessment themes were identified for the Warrington East- Phase 2 scheme:

Table 16 shows the criteria and sub criteria against which options and their relative weightings:

Table 16: Stage B Assessment themes and criteria

Theme	Criteria	Weight	Sub criteria	Weight
Alignment with Objectives	Transport objectives	3	Reduce Congestion	3
			Improve network resilience to incidents	2
			Improve journey reliability times	2
			Provide a safe, well connected network for cyclists and pedestrians	1
	Land use Objectives	2	Release land for new development	1
			Raise occupancy of existing vacant development stock	1
			Increase density of existing commercial buildings	1
			Relocation of existing commercial occupiers	1
			Release land for new housing	1
	Wider Strategic Objectives	1	Maximise potential as part of NPH	1
			Foster economic growth and employment	1
			Support Birchwood EPZ, delivery of SEP economic plan and 'Warrington Means Business'	1
			Make Warrington East a place where people want to live and work	1
			Maximise potential as part of NPH	1
Deliverability of the option	Land ownership / acquisition issues	1	No sub criteria identified	N/A
	Physical barriers	1	No sub criteria identified	N/A
	Ecological constraints	1	No sub criteria identified	N/A
	Scheme Support	1	No sub criteria identified	N/A

Source: Mott MacDonald

A detailed rationale for the selection of criteria and assignment of weights is provided in the OAR.

16.1.2.1 Stage B option sifting results

Under both Alignment with Objectives and Deliverability assessment themes, each option had the potential to score a maximum of 2.00 and in total score a maximum of 4.00. On the basis that no option scoring negatively would be taken forward as this would indicate a detrimental fit, the threshold for progression to Stage C was therefore set at 2.00, a score of more than 50% of the maximum positive score.

The results of Stage B INSET are displayed below in Table 17. The Total Quantitative Score column shows each option's overall score. The column to the right indicates each options rank based on total score alone. Schemes highlighted in green under the 'Total Quantitative Score' were taken forward for further development in Stage C based as they exceeded the threshold score of 2.00.

Table 17: Stage B option appraisal results

Option Name	Alignment with objectives	Deliverability score	Total Quantitative Score	Rank based on total score only
College Place –	-1.45	1.00	-0.45	10

Option Name	Alignment with objectives	Deliverability score	Total Quantitative Score	Rank based on total score only
Do Nothing				
College Place – Do Something 1	0.45	1.75	2.20	4
College Place – Do Something 5	1.52	1.50	3.02	1
College Place – Do Something 6	1.87	0.25	2.12	5
Oakwood Gate – Do Nothing	-1.13	1.00	-0.13	9
Oakwood Gate – Do Something 2	0.74	1.00	1.74	6
Oakwood Gate – Do Something 3	1.39	1.25	2.64	2
Moss Gate; A574 Birchwood Way – Do Nothing	-0.87	1.25	0.38	8
Moss Gate; A574 Birchwood Way – Do Something 1	0.98	1.25	2.23	3
Moss Gate; A574 Birchwood Way – Do Something 2	1.24	-0.75	0.49	7

Source: Mott MacDonald

16.1.3 Stage C process and appraisal results

The shortlist of options that resulted from the Stage B sift resulted in 3 viable options for College Place, but only one viable option at both the Oakwood Gate and Moss Gate/A574 Birchwood Way sites.

These remaining options were then packaged into three packages that included interventions at all three sites. The only variant in each of the packages was the College Place scheme component as it was the only site where alternative scenarios proved viable. The three packages are noted in Table 18 below.

Table 18: Option packages

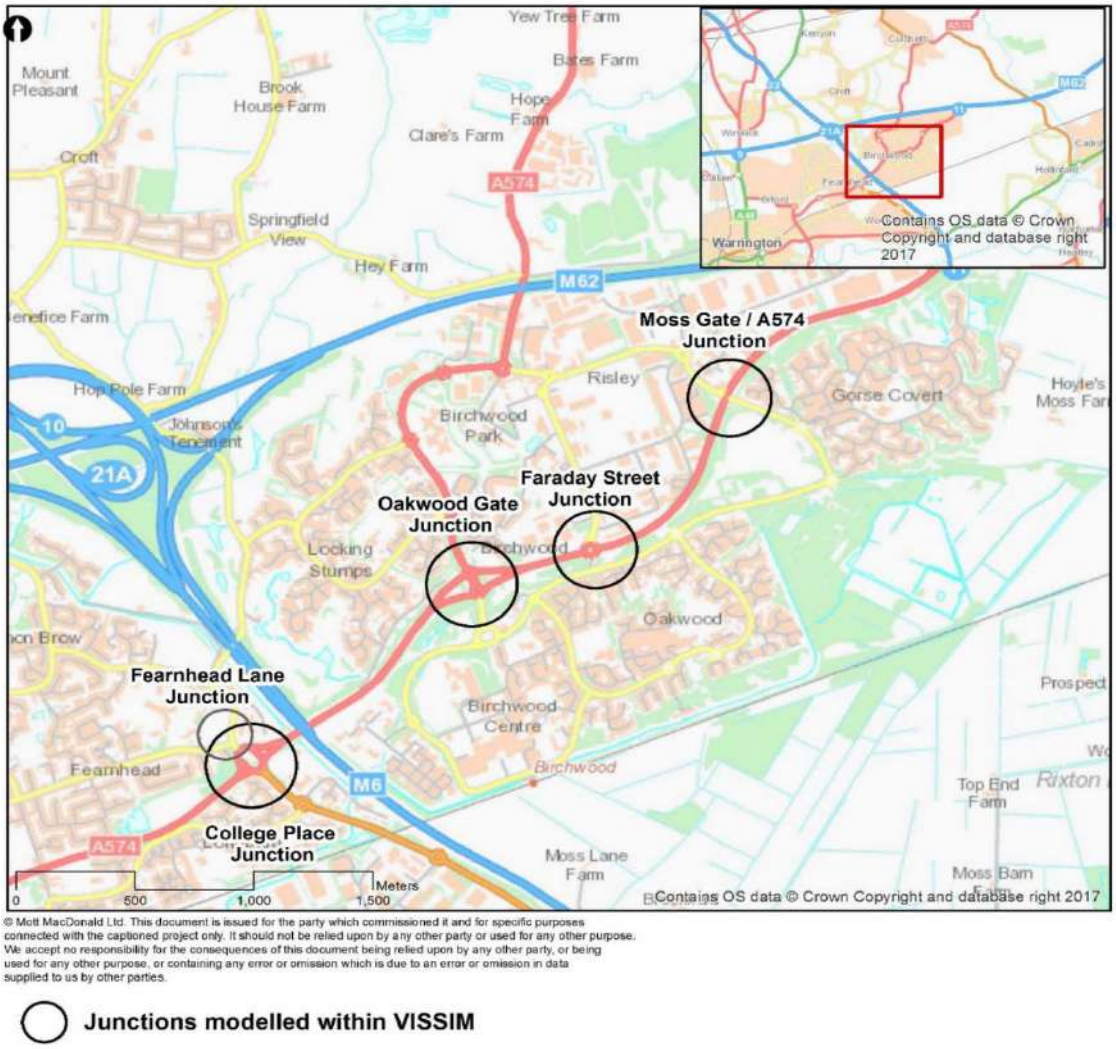
Option Package	Package of Interventions
Do Nothing	• Existing Layout
Option package 1 – Do minimum	• College Place: Woolston Grange Avenue approach signalisation • Oakwood Gate: Free flow left turn from Oakwood Gate • A574 Birchwood Way: Extended eastbound merge by 266m, extended westbound merge by 175m
Option package 2 – Do Something	• College Place: Woolston Grange Avenue, Birchwood Way East and Birchwood Way West approach signalisation. Three approach lanes on Birchwood Way East • Oakwood Gate: Free Flow left turn from Oakwood Gate • A574 Birchwood Way: Extended eastbound merge from 266m, extended westbound merge by 175m
Option package 3 – Do Maximum	• College Place: Flyover • Oakwood Gate: Free-Flow left turn from Oakwood Gate • A574 Birchwood Way: Extended eastbound merge by 266m, extended westbound merge by 175m

Source: Mott MacDonald

Stage C appraisal was undertaken using micro-simulation software VISSIM. VISSIM dynamically assesses the performance of the options at each junction in their respective

packages against the Do Nothing scenario at each intervention site. Modelling was undertaken using models with a base year of 2018 and 2028. The initial results show the impact of change at not only the intervention sites but also at other key junctions within the local network. Figure 46 shows the junctions that were modelled in VISSIM.

Figure 45: Map of VISSIM modelled junctions



Source: Mott MacDonald

In order to assess the impacts of the proposed intervention packages, each package needed to be compared against doing nothing. Although the Do Nothing options for each site were sifted out at either Stage A or Stage B they have been included here solely for the purposes of modelling.

16.1.3.1 Stage C options appraisal results

The table below shows the impacts of each of the three option packages on the three junctions designated for intervention plus the two additional junctions in the immediate locality, illustrated in Table 19, to understand the impacts on the wider network. Figures highlighted in green indicate an improvement relative to the Do Nothing scenario and figures in red indicate a deterioration relative to the Do Nothing.

Table 19: Initial VISSIM Results - Total delay measured in junction delay (vehicle hours) - 2018 model

Option Package	Fearnhead Lane		College Place		Oakwood Gate		Faraday Street		Moss Gate/ A574 Birchwood Way		Total	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	**AM**	**PM**
Do Nothing: Baseline	34	7	79	134	31	64	4	4	26	89	**175**	**297**
Option Package 1: Do Minimum	106	6	36	139	25	29	4	3	26	71	**197**	**248**
Option Package 2: Do Something	11	6	71	36	29	24	4	4	26	71	**142**	**140**
Option Package 3: Do Maximum	16	7	23	15	34	21	4	5	26	62	**103**	**111**

Source: Mott MacDonald

Table 20 shows using the 2018 base model that overall there is more improvement in junction delay than deterioration at most junctions for each of the three packages relative to the Do Nothing scenario, however only the Do Something and Do Maximum packages succeed in improving overall junction delay across the local network in both the AM and PM peak, which is when congestion issues are most prevalent.

Table 20: Initial VISSIM Results - Total delay measured in junction delay (vehicle hours) - 2028 model

Option Package	Fearnhead Lane		College Place		Oakwood Gate		Faraday Street		Moss Gate/ A574 Birchwood Way		Total	
	AM	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Do Nothing: Baseline	59	14	114	182	39	83	5	7	29	126	**246**	**411**
Option Package 1: Do Minimum	105	13	82	187	36	85	5	12	30	114	**258**	**412**
Option Package 2: Do Something	67	15	86	46	60	42	5	14	31	115	**249**	**232**
Option Package 3: Do Maximum	70	22	44	24	66	38	5	15	32	115	**216**	**214**

Source: Mott MacDonald

It can be seen that when using the 2028 base model there is overall more deterioration in junction delay than improvement. Only the Do Maximum option succeeds in reducing delay in the AM and PM peak.

On this basis it could be assumed that the Do Maximum option should be the one considered as the preferred option, however VISSIM modelling, whilst showing overall network performance does not take into account the cost of a scheme or the relative value of potential benefits relative to the cost. As a result, all three packages were progressed to Stage D to assess value for money.

16.1.4 Stage D process and appraisal results

Stage D calculated an indicative, transport only, benefit-to-cost ratio (BCR) for the three option packages.

The assessment was carried out in line with Department for Transport (DfT) Transport Analysis Guidance (TAG) on cost benefit analysis (Unit A1.1). The indicative benefits have been calculated on the travel times indicated by the VISSIM model. In each case, the travel time has been compared to the Do Nothing scenario.

In accordance with the Cost Benefit Analysis criteria, TAG Unit A1.1 the schemes were each assessed over a 60-year period. Additionally, it should be noted that as per the VISSIM model, the modelled years are 2018 and 2028. These results were interpolated and extrapolated accordingly to obtain economic benefits for all other years, which were then discounted to 2010 prices. A full account to the methodology, cost breakdown of each of the options packages and modelling assumptions are noted in Section 9 of the OAR.

16.1.4.1 Stage D option appraisal results

A simplified calculation was undertaken to calculate the scheme benefits for an initial indicative BCR's; this was considered proportionate at this stage of the study.

Table 21: Stage D BCR Assessment Results

Parameter	Option package 1 – Do Minimum	Option package 2 – Do Something	Option package 3 – Do Maximum
Indicative Present Value of Costs (PVC)	£ 9,077,919	£ 15,490,270	£ 32,730,578
Indicative Present Value of Benefits (PVB)	-£ 21,672,043	£ 16,814,395	£ 26,263,284
Indicative Benefit to Cost Ratio (BCR)	-2.4	1.1	0.8

Source: Mott MacDonald

BCR's are used to assess Value for Money (VfM). The DfT categorizes VfM as follows:

- Poor VfM if BCR is below 1.0
- Low VfM if the BCR is between 1.0 and 1.5
- Medium VfM if the BCR is between 1.5 and 2.0
- High VfM if the BCR is between 2.0 and 4.0

In accordance with DfT guidance, a BCR of 2.0 or more is considered the minimum requirement for scheme progression.

It can be seen that option package 2- Do Something provided the best value for money, although this is below the minimum requirement for progression.

On this basis, and coupled with the initial VISSIM results it was agreed that option 2 was the preferred option, though it required refinement, to improve the low VfM shown above, through a combination of cost and design change.

16.2 Preferred option refinement

Refinement of the preferred option went through several iterations, which are detailed in sections 10 and 11 of the OAR. This refinement included:

- Several stages of design change
- Re-runs of the VISSIM model using both 2018 and 2018 as base years for each new set of designs
- Re-runs of the BCR calculation based on the revised VISSIM model runs

In summary, design changes and model re-runs to reflect those changes, identified improved performance at the three intervention sites, but had an adverse impact on a junction that was not previously considered - Blackbrook Avenue Roundabout. Specifically, the intervention at College Place Roundabout, whilst improving performance at that site was found to cause delay and capacity issues at Blackbrook Avenue. Designs then had to be further refined to allow for work at Blackbrook Avenue as an effective sub component of College Place Roundabout.

The final scheme designs together with the associated VISSIM modelling results and VfM assessment are summarised in Section 17, ‘The Preferred Scheme’.

17 The Preferred Scheme

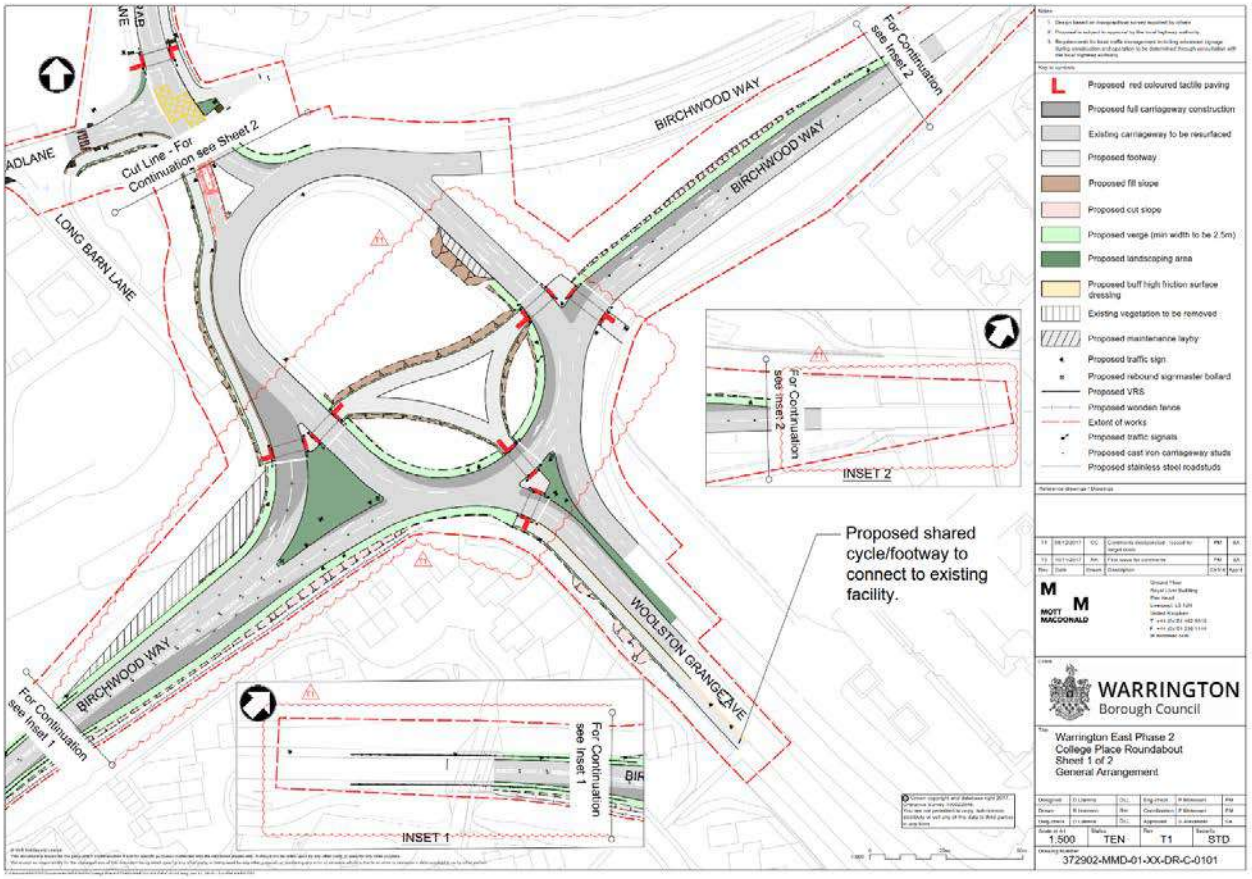
17.1 Final scheme designs

Warrington East Phase 2 works will deliver capacity improvements to three key junctions along the A574 Birchwood Way and together they will form a package that seeks to better manage traffic flow in Birchwood and tackle congestion. The final designs for the scheme components are shown below in Figures 46-51.

17.1.1 College Place Roundabout

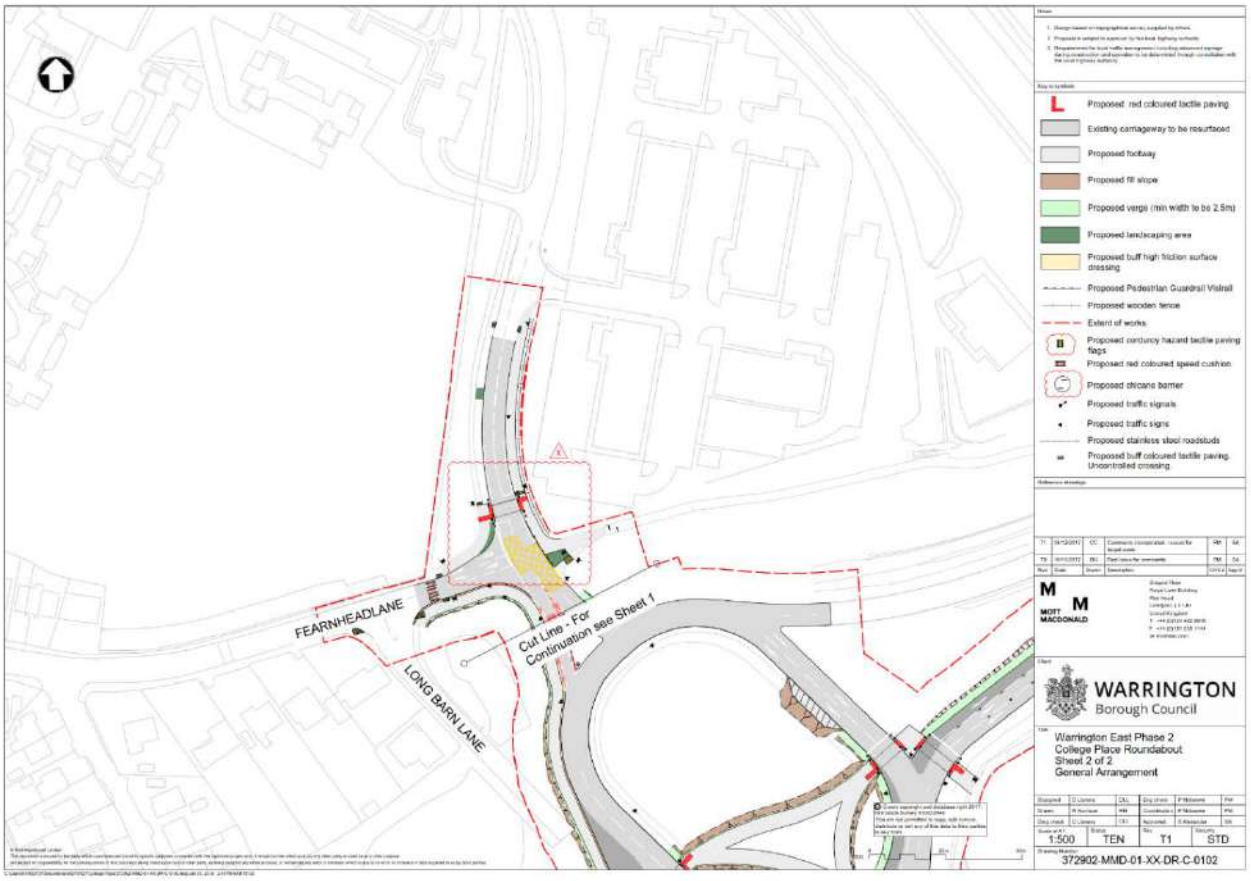
The final design for the College Place component of the overall scheme comprises of signals on Birchwood Way on both the eastbound and westbound approaches, as well as the southerly Woolston Grange Avenue approach to the roundabout. It is proposed to widen the westbound approach on Birchwood Way East to provide a three-lane entry to the roundabout which would provide additional capacity, particularly during the evening peak when there is severe congestion.

Figure 46: College Place Roundabout final design



Source: Mott MacDonald

Figure 47: College Place Roundabout final design- Fearnhead Lane and Crab Lane Junction

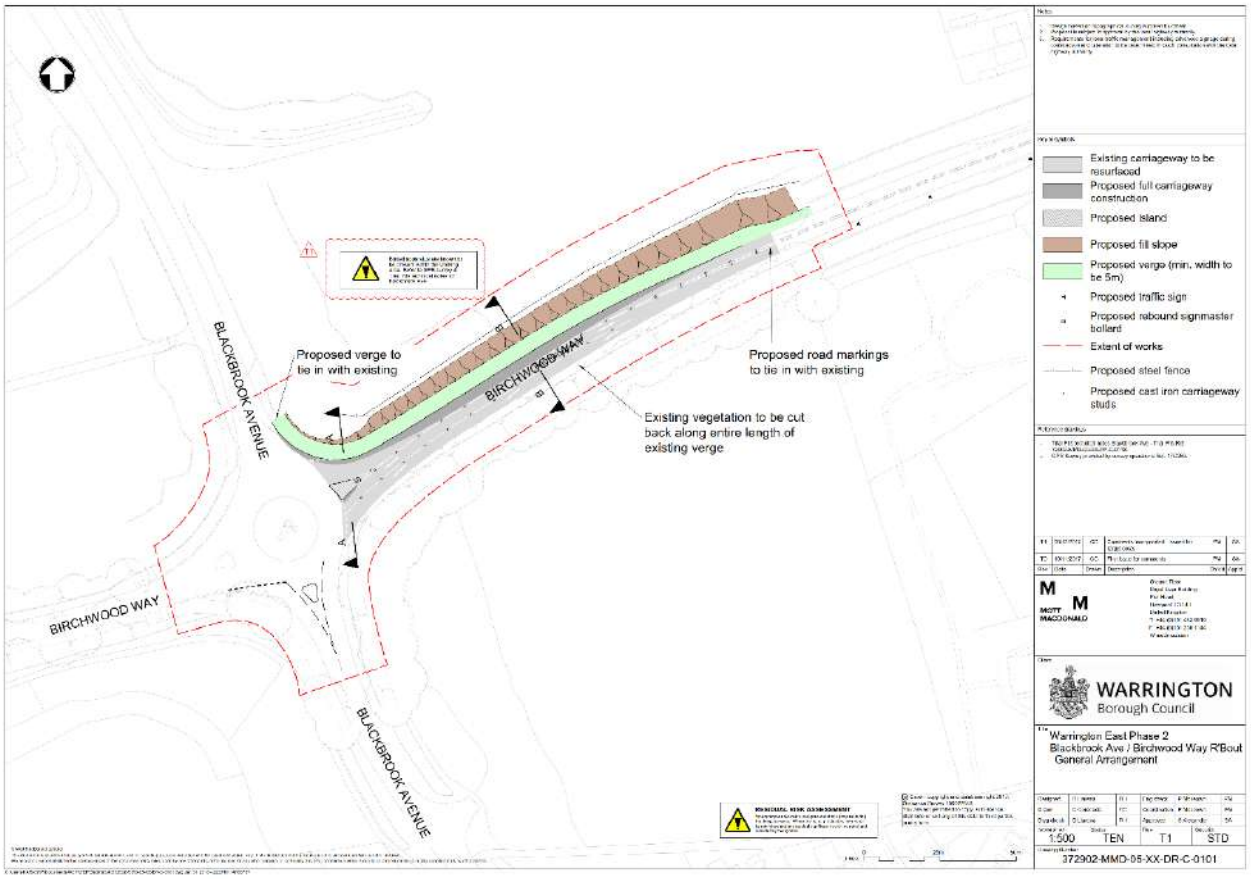


Source: Mott MacDonald

17.1.2 Blackbrook Avenue Roundabout

Blackbrook Avenue/Birchwood Way Roundabout, as a sub component of the College Place intervention, will consist of widening of Birchwood Way to provide an additional lane on the westbound approach to the roundabout, resulting in a left turn lane and an ahead and right turn lane. Traffic signs will be updated and the road markings are to be refreshed at the roundabout. On the northern side of Birchwood Way where the widening is to occur a verge of 5 metres is proposed to allow for the future provision of a pedestrian cycle facility. The design is shown in Figure 48.

Figure 48: Blackbrook Avenue Roundabout final design

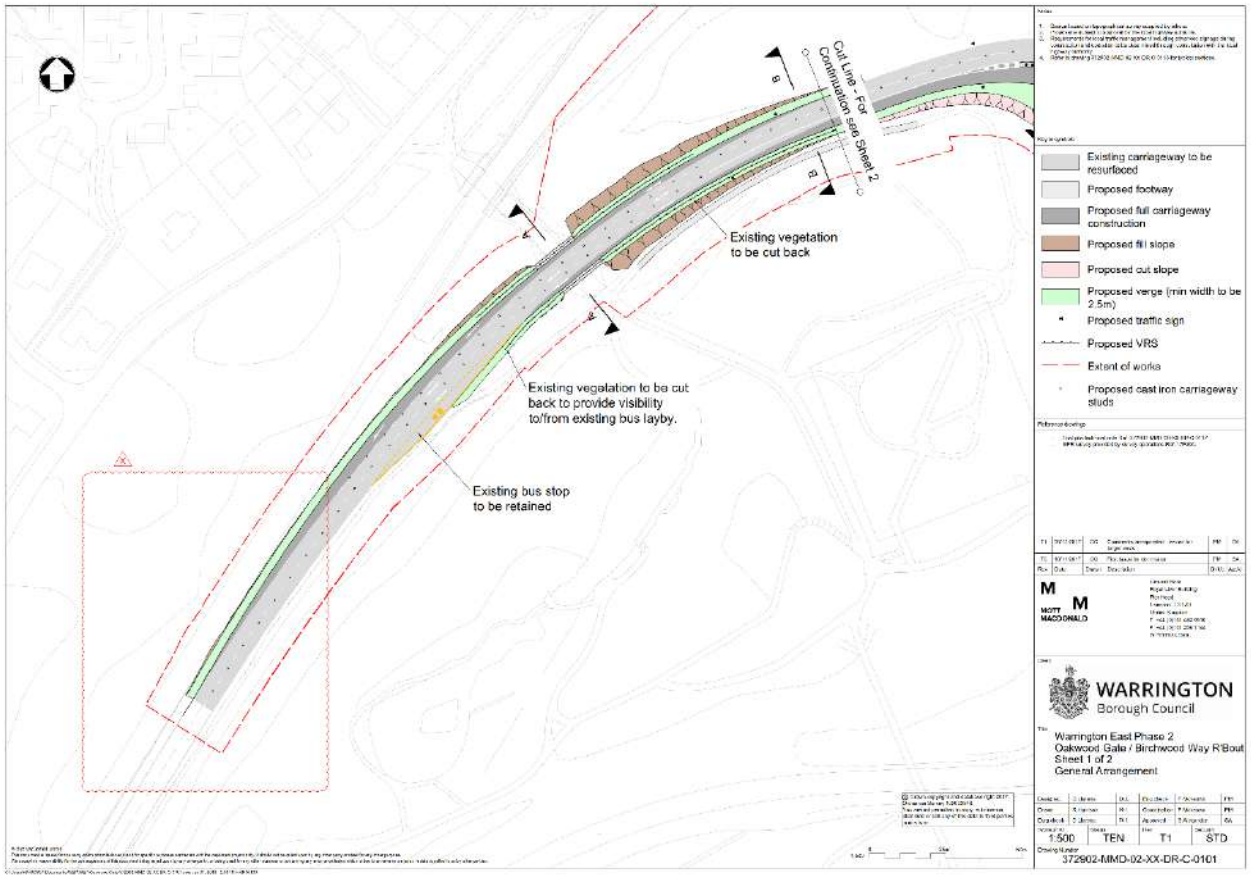


Source: Mott MacDonald

17.1.3 Oakwood Gate/Birchwood Way Roundabout

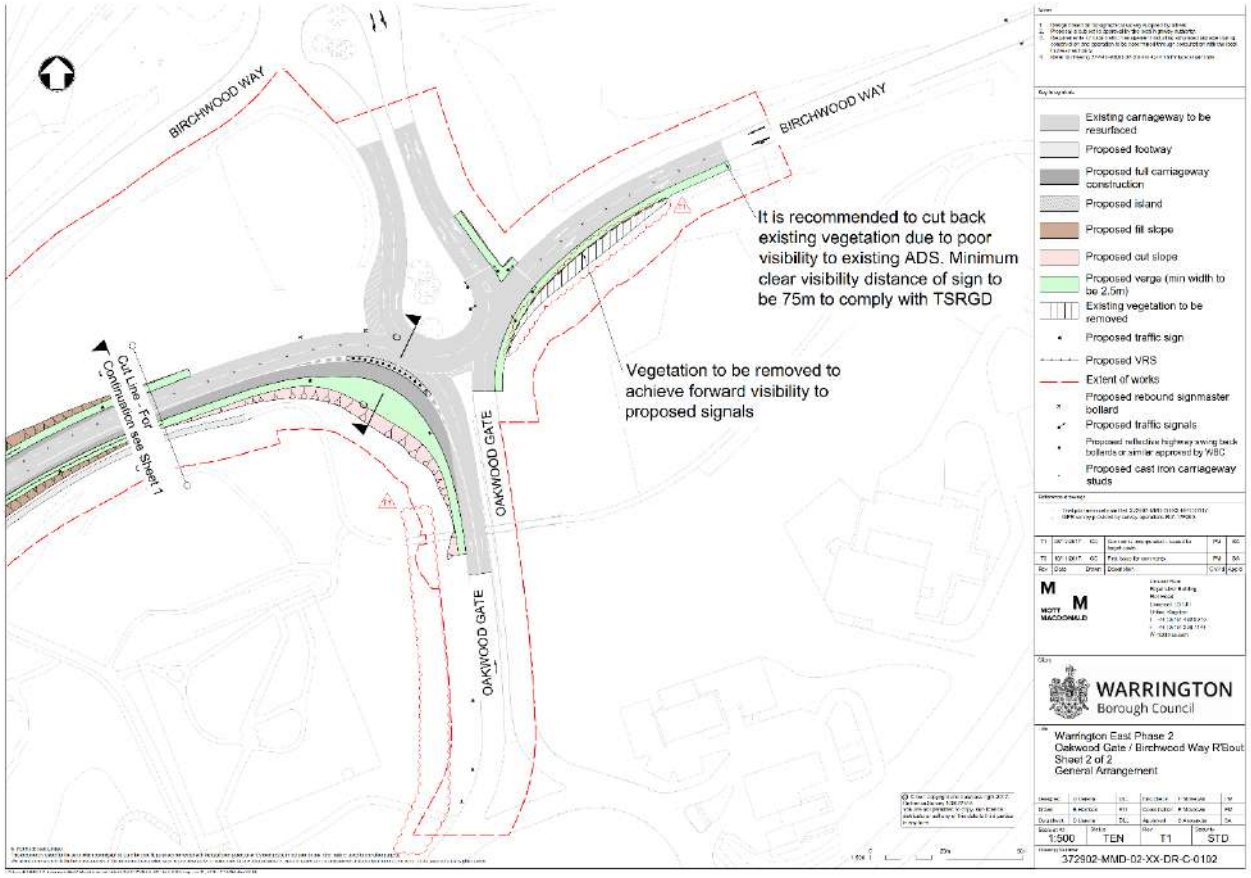
The final design proposed for the site at Oakwood Gate/Birchwood Way Roundabout is shown in Figures 49 and Figure 50. The intervention comprises of the partial signalisation of the existing roundabout with additional signals provided on the westbound approach of Birchwood Way East and a free flow lane from, Oakwood Gate to Birchwood Way West. This would alleviate the congestion on the southern arm approach to the roundabout which at peak times queues as far back as Dewhurst Lane. The free flow lane would become part of the main highway with no merge requirement for traffic entering from the South; instead the merge would be from the outside lane on Birchwood Way West.

Figure 49: Oakwood Gate/Birchwood Way Roundabout final design – Birchwood Way West



Source: Mott MacDonald

Figure 50: Oakwood Roundabout/Birchwood Way Roundabout final design

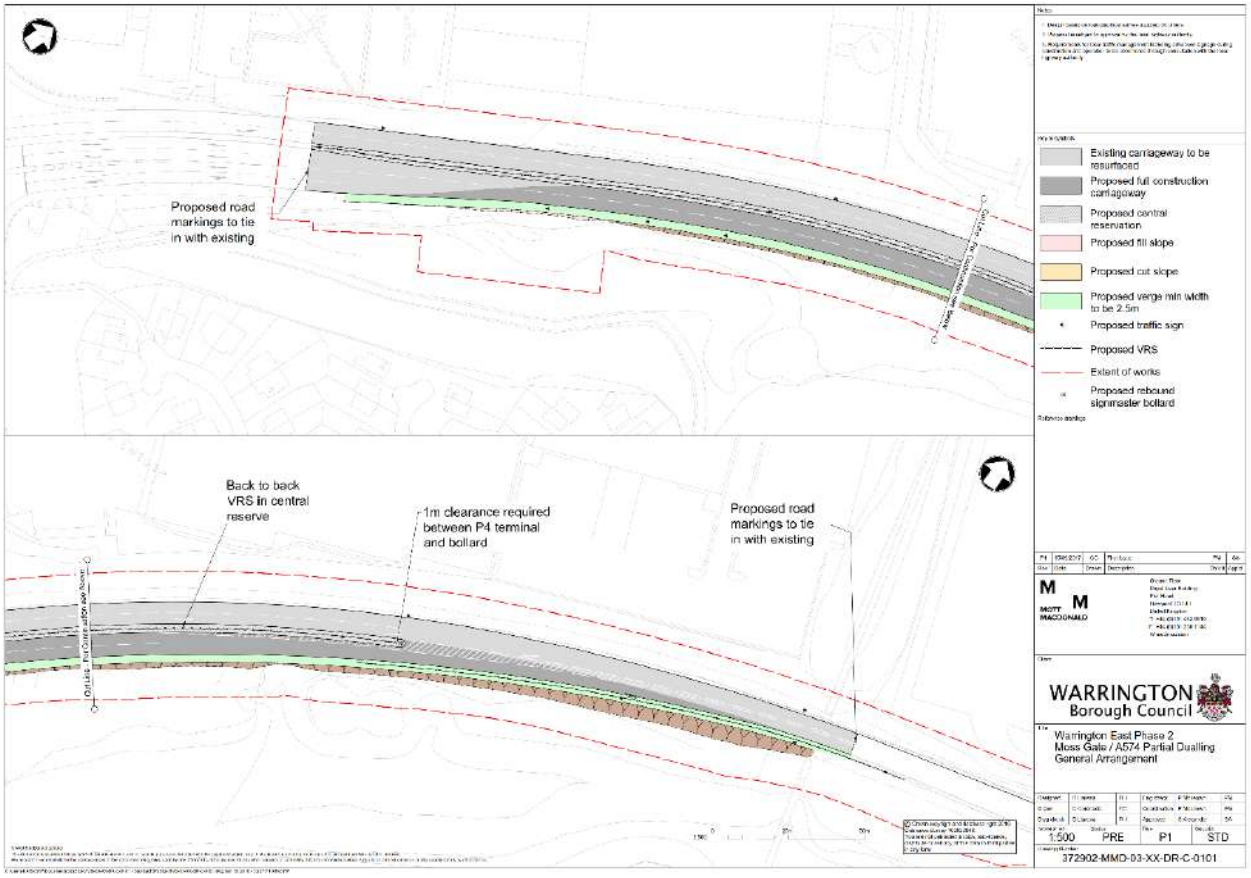


Source: Mott MacDonald

17.1.4 Moss Gate/A574 Partial Dualling

No further changes were made to designs at this stage of the process for the proposed components at Moss Gate/A574 Birchwood Way. This scheme comprises of the partial dualling of the A574 Birchwood Way north of the Moss Gate signalised junction for several hundred additional metres by building an additional carriageway southbound and converting the existing highway into two north bound lanes.

Figure 51: Moss Gate/A574 Birchwood Way Partial Dualling final design



Source: Mott MacDonald

17.2 Final VISSIM results

Following final revisions of the preferred option to maximise the benefits of the scheme, all VISSIM results were updated. During the period between the modelling of the preferred option refinement detailed in Section 10 and the final option package, WBC secured NPIF funding to undertake improvements at the M62 J11. Due to the impact which work here will have on the overall network, this junction was modelled and included within the final VISSIM modelling results. The results of the final VISSIM modelling, comparing junction delay (Vehicle hours) during the AM and PM peaks of the preferred option, with the Do Nothing baseline using both 2018 and 2028 models, can be found in Tables 22 and 23.

Table 22: Final VISSIM Results – Total delay measured in junction delay (vehicle hours) 2018 model

Option Package	Fearnhead Lane		College Place		Oakwood Gate		Faraday Street		Moss Gate/ A574		M62 J11		Blackbrook Roundabout		Total	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	**AM**	**PM**	**AM**	**PM**
Do Nothing: Baseline	52	3	56	59	31	85	5	5	24	41	81	146	36	35	**284**	**373**
Do Something: Preferred Option	5	4	55	33	46	28	5	3	25	66	79	152	22	17	**236**	**302**

Source: Mott MacDonald

Figures in green indicate an improvement at the junction compared to Do Nothing, red a deterioration, and black no change. It can be see that although there is minor deterioration in the amount of delay at Oakwood Gate and at that Moss Gate/A574 junction in the AM peak, and minor deteriorations in the PM peak at Fearnhead Lane, Moss Gate/A574 and M62 J11, overall doing something compared to doing nothing noticeably improves capacity across the network in both the AM and PM peak, when using the 2018 model.

Table 23: Final VISSIM Results – Total delay measured in junction delay (vehicle hours) 2028 model

Option Package	Fearnhead Lane		College Place		Oakwood Gate		Faraday Street		Moss Gate/ A574		M62 J11		Blackbrook Roundabout		Total	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	**AM**	**PM**	**AM**	**PM**
Do Nothing: Baseline	75	3	81	98	46	144	6	23	79	82	95	176	73	45	**445**	**570**
Do Something: Preferred Option	19	5	77	37	112	34	8	21	105	126	94	173	47	20	**463**	**414**

Source: Mott MacDonald

It can be seen from the above that using the 2028 model there is significant deterioration in delay during the AM and PM peak at Moss Gate/A574 and the AM peak at Oakwood Gate. Minor deterioration in delay during the PM peak at Fearnhead Lane can also be seen. Although minor deterioration in total delay can be seen during the AM peak, significant improvement can be seen in the PM peak, indicating a noticeable improvement in capacity across the network when using the 2028 model.

17.3 Value for money

Following final revisions to scheme components and updated VISSIM modelling as detailed in Section 11.3, updated BCR's were calculated for the preferred options for the junctions. Initial and modified BCR's were calculated and can be seen below in Table 24. The scheme delivers Present Value of Benefits of £38.82m over a 60 year appraisal period. Considered together with the scheme cost of £11.88m (to public accounts), the transport improvements yield a Benefit-to-Cost Ratio (BCR) of 3.27.

Table 24: Assessment summary (in £000s, 2010 prices if not stated)

BCR Element	Initial BCR	Adjusted BCR
Scheme Costs in 2018 prices	13,198	13,198
Scheme Costs including risk and optimism bias of 15% in 2018 prices	15,179	15,179
(All entries below are present values discounted to 2010, in 2010 prices)		
Cost to Public Accounts (including risk and optimism bias of 15%)	11,699	11,699
Main Transport Economic Benefits	37,059	37,059
Journey Time Reliability Benefits	-	1,955
Accidents	1,761	1,761
Present Value of Costs (PVC)	11,881	11,881
Present Value of Benefits (PVB)	38,820	40,775
Benefit to Cost Ratio (BCR)	**3.27**	**3.43**

Source: Mott MacDonald

According to DfT guidance and criteria[23], the initial BCR of **3.27** calculated based on transport benefits alone yields **High Value for Money**. The modified BCR is **3.43** which also represents **High Value for Money.**

The modified BCR assessment includes:

- Journey time benefits to transport users
- Journey time reliability benefits
- Accident benefits

It can be concluded from this assessment that the Warrington East Phase 2 scheme produces a **Strong Value for Money** case.

17.4 Potential scheme constraints

The previous section has outlined the preferred scheme option for Warrington East Phase 2, which was selected from a long list of potential options on the basis of a rigorous multi-phased appraisal process.

However, despite the identification of the option detailed above, the potential constraints and key interdependencies of the scheme must also be considered so that measures can be derived in the event they come to fruition. The key constraints of the scheme fall into four broad categories detailed below.

[23] Value for Money Assessment: Advice Note for Local Transport Decision Makers, Department for Transport https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267296/vfm-advice-local-decision-makers.pdf

17.4.1 Funding

The following constraints associated with the funding of Warrington East Phase 2 have been identified:

- A limit on funding levels
- Funding being drawn down between financial years 2018/19 and 2020/21

Whilst WBC have secured internal and third-party funding for a portion of Warrington East Phase 2, there is a reliance of being granted Local Growth Funding from the C&W LEP for the scheme to progress. Furthermore, if that funding is approved, WBC must deliver the scheme within the funding timeframe noted above.

17.4.2 Land Acquisition

Warrington East Phase 2 seeks to adopt ownership of three key sites, presenting a potential constraint to scheme delivery. Land to the east of Blackbrook Avenue Roundabout is currently a sport playing field for University Academy Warrington. Works at Blackbrook Avenue Roundabout will require a proportion of this land to be adopted from the school, with permission from Sport England needed. The scheme will additionally require the acquisition of a small section of land which runs alongside Birchwood Way currently owned by the Woodlands Trust, a good relationship with the organisation currently exists thus this should be viewed as a minor constraint to delivery. A piece of land surrounding College Place roundabout will also require adoption to accommodate the extent of the works here.

17.4.3 Physical build out considerations

Works to upgrade the M62 to a smart motorway between J10 and J11 are anticipated to be delivered within a similar time frame to Warrington East Phase 2. The interface of the delivery of these two schemes could present a constraint.

17.4.4 Ecological issues

The ecology of the Warrington East Phase 2 study site presents seasonal constraints to the successful delivery of the scheme. Great Crested Newts have been found to be present along a stretch of Birchwood Way, east of the junction between Daten Ave and Moss Gate. The proposed works have the potential to affect the species through the loss of habitat and interruption of breeding patterns. The hibernation cycle of the Great Crested Newts determines when the species can be relocated safely and successfully allowing the works to take place. Any work undertaken will be mindful of the timescales required to accommodate this constraint.

17.5 Scheme interdependencies

Warrington East Phase 2 is not reliant upon any other works or issues.

Economic Case

Section 18

18 Economic Case

18.1 Introduction

The Economic Case assesses options to identify all their impacts, and the resulting value for money, to fulfil Treasury's requirements for appraisal and demonstrating value for money in the use of taxpayers' money. The Economic Case identifies what economic, environmental, social and distribution impacts the scheme is expected to deliver.

18.2 Approach to the development of the Economic Case

The Economic Case for Warrington East Phase 2 has been developed to ensure that it proportionally follows the requirements of the DfT's *'The Transport Business Case: Economic Case'* which are noted below.

Table 25: Compliance with DfT requirements for the Economic Case

Content	DfT requirements	Section number and title(s)
Introduction	Outline approach to assessing value for money.	18.3 Scope of Appraisal 18.4 Methodology
Options appraised	A list of the options (set out in the Strategic Case) that have been appraised.	18.5 Overview of options
Assumptions	WebTAG sets out assumptions that should be used in the conduct of transport studies. List any further assumptions supporting the analysis.	18.6 Assumptions
Sensitivity and risk profile	Set out how changes in different variables affect the Net Present Value/Net Present Cost. The risk profile should show how likely it is that these changes will happen.	18.12 Sensitivity Test
Appraisal Summary Table	See WebTAG for detailed guidance on producing the Appraisal Summary Table.	18.13 Appraisal Summary Table
Value for Money Statement	See Value for Money guidance on producing the VfM statement.	18.14 Value for Money Statement

Source: DfT

18.3 Scope of the Appraisal

The economic appraisal has been carried out in line with Department for Transport (DfT) Transport Appraisal Guidance (TAG). The primary transport modelling platform is the Warrington East VISSIM Model which is a microsimulation model suitable for calculating a BCR for the proposed transport improvements. The economic assessment uses the Department for Transport (DfT) TUBA 1.9.9 (Transport Users Benefit Assessment) software, which carries out an economic assessment in accordance with published DfT guidance[24].

The economic benefits calculated for the scheme include:

- **Transport economic benefits (TAG A1 and TAG A2.3).** The transport economic appraisal has been undertaken using the TUBA program, which carries out an economic appraisal in

[24] Department for Transport: webtag-tag-unit-a1-1-cost-benefit-analysis
Department for Transport: webtag-tag-transport-appraisal-process

accordance with published DfT guidance. This is based on trip and cost matrices from the Warrington East VISSIM Model and travel cost changes implied by the proposed schemes.

- **Accident benefits.** Estimation of accident benefits has been carried out using COBALT, the DfT's tool for accident appraisal.
- **Journey reliability benefits (TAG A1).** The estimate of journey time reliability benefits is made to satisfy the 'Reliable journeys' sub-objectives within the 'Economy' section of scheme appraisal. The calculations assume that the model area is dominated by urban regions and therefore uses the urban journey time reliability calculations that are set out in the TAG unit.

18.4 Methodology

The economic assessment has been carried out in line with DfT Guidance[25] with a number of relevant simplifying assumptions adopted specifically to produce Value for Money (VfM) assessments.

The main transport modelling platform is the Warrington East VISSIM Model. The Warrington East VISSIM[26] Model has a base year of 2016 and includes up to date transport forecasts for Warrington East. The following junctions have been modelled:

Signal controlled:

- Oakwood Gate roundabout (west approach)
- Birchwood Way / Moss Gate
- M62 eastbound on-slip ramp metering

Priority controlled:

- Crab Lane / Fearnhead Lane
- College Place roundabout
- Oakwood Gate roundabout (north, east and south approaches)
- Faraday Street roundabout
- M62 J11 roundabout

18.5 Overview of options

Three options were modelled using the Warrington East VISSIM Model and indicative BCRs calculated based on travel time savings; from this analysis the preferred option was determined. The Options Appraisal Report provides full details (Appendix A).

18.6 Assumptions

In order to arrive at the economic benefits, a number of modelling and appraisal assumptions have been adopted. The standard TAG appraisal forms the basis of the approach with specific assumptions and simplifications made to allow best use of available local modelling data, the perceived nature of the schemes and the longevity of their impacts.

[25] Department for Transport: webtag-tag-unit-a1-1-cost-benefit-analysis

[26] Warrington East LEP Phase 2 VISSIM, Local Model Validation Report

18.6.1 Assessment Period

The Warrington East Phase 2 scheme will impact on both local and strategic traffic movements. On this basis, the TAG recommended assessment period of 60 years has been adopted.

18.6.2 Modelled Years

The scheme is due for implementation during the period 2018-2021. The economic assessment has been based on 2018 and 2028 traffic modelling where data is readily available from the Warrington East VISSIM Model. These results are then interpolated and extrapolated accordingly (in the modelling and appraisal tools) to obtain economic benefits for all other years, which are then discounted to 2010.

18.6.3 Modelled Time Periods

The traffic modelling has been undertaken for the following weekday time periods:

- AM (07:45 – 08:45)
- IP (12:30 – 13:30)
- PM (16:45 – 17:45)

For assessment, time period factors are used to convert the model outputs to be representative of annual totals (see Section 18.6.6).

The assessment does not include any assessment of the scheme benefits in the evenings and weekends.

18.6.4 Model Inputs

The model forecasts have been developed based on the 2016 calibrated / validated base year.

Model forecasts have been developed for 2018 and 2028.

The matrix growth is based on the forecasts contained in the Department for Transport National Trip End Model (NTEM) which uses TEMPRO[27] software for output of data. The TEMPRO version used for extracting growth trends for this assessment is version 7.2.

The matrix takes into account forecast growth due to the redevelopment of Birchwood Business Park:

- the transport assessment (TA)[28] provided states that 53% was built out as of May 2015 (para 2.2.4) and Warrington Borough Council (WBC) confirmed that no further development had occurred since. The trip generation within the TA was then prorated to yield the remaining trips to/from the business park
- trip generation was based on remaining trips from the total site generation (derived from the trip rates shown in Table 5.1 of the TA and GFA shown in Table 5.3 of the TA for the AM/PM peaks respectively). The total trip generation for the IP will be derived based on the trip rates shown in Appendix 4 of the TA
- the trips were then distributed onto Faraday Street and Daten Avenue based upon a combination of the Warrington Multi Modal Transport Model distribution and the existing split of traffic between Faraday Street and Daten Avenue. The SATURN model was used for the wider distribution based upon the proportion of the sum of trips to/from the combined Faraday Street/Daten Avenue accesses, then these were distributed to the individual streets

[27] TEMPRO – Department for Transport (DfT) Trip End Model Presentation Program

[28] Redevelopment of Birchwood Park, Warrington, Transport Assessment

based upon the existing split of traffic between Faraday Street and Daten Avenue. This method used the best available data

- following this the percentage growth was calculated and compared to the TEMPRO 7.2 derived growth rates to determine the remaining growth rate for background traffic in order to cap at TEMPRO growth levels

The scenario represents traffic growth from TEMPRO 7.2 incorporating proposed development trips. All model scenarios have been constrained to TEMPRO 7.2 growth projections.

The junction improvements have been coded into the model using the same coding procedures used in the development of the model to create two scenarios:

- without scheme improvements
- with scheme improvements

The without scheme improvements scenario contains two committed schemes:

- M62 NPIF Scheme
- North of Moss Gate dualling

The with scheme improvements scenario contains the committed schemes plus the proposed junction improvements at:

- Blackbrook Avenue
- College Place/Birchwood Way Roundabout
- Oakwood Gate/Birchwood Way Roundabout
- Moss Gate Junction

18.6.5 Model Outputs

Table 26 to Table 28 present the impact on junctio delay in the without scheme and with scheme scenarios at junctions along the corridor.

Table 26: Junction Delay AM (vehicle hours, in modelled time period)

Junction	2018 without scheme	2018 with scheme	2028 without scheme	2028 with scheme
Fearnhead Lane	52	5	75	19
College Place	56	55	81	77
Oakwood Gate	31	46	46	112
Faraday Street	5	5	6	8
Moss Gate	24	25	79	105
M62 J11	81	79	95	94
Blackbrook Road	36	22	73	47
Total	**284**	**236**	**455**	**463**

Table 27: Junction Delay IP (vehicle hours, in modelled time period)

Junction	2018 without scheme	2018 with scheme	2028 without scheme	2028 with scheme
Fearnhead Lane	1	1	1	1
College Place	4	17	5	19
Oakwood Gate	13	13	16	15
Faraday Street	1	1	2	1
Moss Gate	10	10	14	14
M62 J11	11	11	37	35
Blackbrook Road	3	3	4	4
Total	**43**	**56**	**78**	**91**

Table 28: Junction Delay PM (vehicle hours, in modelled time period)

Junction	2018 without scheme	2018 with scheme	2028 without scheme	2028 with scheme
Fearnhead Lane	3	4	3	5
College Place	59	33	98	37
Oakwood Gate	85	28	144	34
Faraday Street	5	3	23	21
Moss Gate	41	66	82	126
M62 J11	146	152	176	173
Blackbrook Road	35	17	45	20
Total	**373**	**302**	**570**	**414**

18.6.6 Annualisation

Annualisation factors convert benefits calculated for each model time period to convert into totals for the full year. To achieve this, analysis has been undertaken of traffic counts used in the development of the Warrington East VISSIM Model which are representative of the scheme area. The annualisation factors can be found in Table 29.

Table 29: Annualisation Factors

Time Period	Factor
AM	675
IP	1,570
PM	696

18.6.7 Scheme Costs for Appraisal

The scheme cost components are given in Table 30 below. In line with cost guidance in TAG A1.2, a quantified risk assessment (QRA) has been undertaken and an Optimism Bias of 15% has been applied in the appraisal.

Table 30: Scheme Costs

Component	Cost (£)
Base Cost	£9,500,537
QRA Cost	£1,651,073
Scheme Total	£13,198,872
Optimism Bias (15%)	£1,979,830
TOTAL	**£15,178,702**

18.7 Transport Economic Efficiency (TEE)

The completed Transport Economic Efficiency (TEE) table is included in Appendix E. The transport modelling has shown that the Warrington East Phase 2 scheme produces reductions in delay and journey time for traffic. The TEE table reflects this and shows that the transport interventions when assess in isolation result in benefits for all road users.

The overall Present Value of Transport Economic Efficiency Benefits is **£36.99m** (2010 prices, discounted to 2010).

18.8 Public accounts

The impact on public accounts for the Warrington East Phase 2 scheme is set out in Appendix E, and is a cost to the public accounts of **£11.88m**. There is a cost of **£0.18m** in Indirect Tax Costs for central government.

18.9 Analysis of monetised cost and benefits

The Analysis of Monetised Costs and Benefits (AMCB) details are set out in Appendix E and show an overall PVC of the scheme as **£11.88m** against an overall PVB of **£38.82m** having allowed for impacts of indirect taxation on the economy and greenhouse gases.

This gives an initial BCR of **3.27** before impacts implied by the journey time changes are included.

18.10 Accident benefits

Accident benefits have been calculated using the DfTs Cost and Benefit to Accidents – Light Touch (COBALT) software. COBALT assesses the safety aspects of road schemes using details of the roads and junctions that would be impacted by the scheme. The assessment is based on a comparison of accidents by severity and associated costs across the network. The assessment uses link and junction characteristics, relevant accident rates and costs, and forecast traffic volumes for each link and junction. Default accident rates have been used, and the entire network covered by the VISSIM model has been assessed.

Accident benefits provide a benefit of **£1.76m** as shown in Table 31. The accident benefits largely arise from the conversion of the College Place roundabout to a signalised roundabout.

Table 31: Accident Benefits

Accident Benefits	£000s
Total Accident Benefits saved by Scheme	1,761

All entries are in thousands of pounds discounted to 2010 in 2010 prices

18.11 Reliability benefits

The term reliability refers to variation in journey times that individuals are unable to predict (journey time variability, or JTV). Such variation could come from recurring congestion at the same period each day (day-to-day variability, or DTDV) or from non-recurring events, such as incidents. It excludes predictable variation relating to varying levels of demand by time of day, day of week, and seasonal effects which travellers are assumed to be aware. The measure of travel time variability is the standard deviation of travel time, and reliability benefits are calculated based on the change in standard deviation of travel time with a transport scheme in place as per the guidance in TAG A1.3. The urban roads calculation has been used.

The journey time reliability benefits have been calculated using the equation:

$$Reliability = -\frac{1}{2}\sum_{ij} \Delta\sigma_{ij} * \left(T_{ij}^{0} + T_{ij}^{1}\right) * VOR$$

where:

- $\Delta\sigma_{ij}$ = change in standard deviation of journey time from i to j (in seconds)
- $T_{ij}^{0} + T_{ij}^{1}$ = journey time, without and with scheme, from i to j (in seconds)
- VOR = value of time multiplied by the reliability ratio, where the reliability ratio is set to 0.4 as per TAG Unit A1.3.

The journey time reliability details are set out in Table 32 and show a benefit of **£1.96m**.

Table 32: Journey Time Reliability Benefits

Reliability Benefits	£000s
Journey Time Variability Benefits 2020	124
Journey Time Variability Benefits 2030	29
Journey Time Variability Benefits (60 year period)	1,955

All entries are in thousands of pounds discounted to 2010 in 2010 prices

18.12 Sensitivity Test

A sensitivity test has been carried out which aims to establish by what proportion the user benefits would need to decrease or the scheme costs increase for the initial BCR to be under 2.

This has found that:

- Benefits could decrease by 39% before the BCR becomes less than 2
- Costs could increase by 63% before the BCR becomes less than 2

Table 33: Sensitivity Test

Element	Initial BCR	Benefit Decrease	Cost Increase
PVC	11,881	11,881	(+63%) 19,366
PVB	38,820	(-39%) 23,797	38,820
BCR	3.27	2.00	2.00

18.13 Appraisal Summary Table (AST)

The Appraisal Summary Table (AST) provides details of the impacts of the scheme. These include both qualitative and quantitative benefits as required by DFT guidance. The quantitative benefits are given in the AST in Appendix F. The qualitative benefits are given in and shows that the scheme provides the following impacts:

Table 34: Estimated impacts of the scheme in the AST

Impacts	Sub-impacts	Estimated Impact
Economy	Business users & transport providers	High
	Reliability impact on Business users	Low
	Regeneration	N/A
	Wider Impacts	Low
Environmental	Noise	N/A
	Air Quality	N/A
	Greenhouse gases	Low
	Landscape	N/A
	Townscape	N/A
	Heritage of Historic resources	N/A
	Biodiversity	N/A
	Water Environment	N/A
Social	Commuting and Other users	High
	Reliability impact on Commuting and Other users	Low
	Physical activity	Low
	Journey quality	Low
	Accidents	Low
	Security	Low
	Access to services	N/A
	Affordability	N/A
	Severance	Low
	Option values	N/A
Public Accounts	Cost to Broad Transport Budget	Low
	Indirect Tax Revenues	Low

18.14 Value for Money Statement

Economic benefits for the Warrington East Phase 2 scheme have been calculated based on the preferred options for the junctions. The analysis provides an indication of likely economic benefits and the BCR for the scheme. The scheme seeks to address a number of transport problems along A574 Birchwood Way which is prone to congestion and travel delay. The scheme aims to reduce congestion along Birchwood Way to help improve journey quality, foster economic growth and facilitate development and/or raise occupancy of employment. The scheme also seeks to promote Warrington as a place where people want to live and work.

An economic appraisal shows that the scheme is beneficial to all road users.

The calculation of the initial and modified BCR values is given in

Table 35. The monetised economic benefits (based on transport modelling outcomes) show that the scheme produces an initial BCR of **3.27** from Present Value of Benefits of **£38.82m** (2010 prices, discounted to 2010) and a cost to public accounts of **£11.88m** (2010 prices, discounted to 2010).

Table 35: Assessment summary (in £000s, 2010 prices if not stated)

BCR Element	Initial BCR	Adjusted BCR
Scheme Costs in 2018 prices	13,198	13,198
Scheme Costs including risk and optimism bias of 15% in 2018 prices	15,179	15,179
(All entries below are present values discounted to 2010, in 2010 prices)		
Cost to Public Accounts (including risk and optimism bias of 15%)	11,699	11,699
Main Transport Economic Benefits	37,059	37,059
Journey Time Reliability Benefits	-	1,955
Accidents	1,761	1,761
Present Value of Costs (PVC)	11,881	11,881
Present Value of Benefits (PVB)	38,820	40,775
Benefit to Cost Ratio (BCR)	**3.27**	**3.43**

According to DfT guidance and criteria[29], the initial BCR of **3.27** calculated based on transport benefits alone yields **High Value of Money**. The modified BCR (including an estimation of agglomeration and welfare benefits) is **3.43,** which also represents **High Value of Money.**

The adjusted VfM assessment includes:

- Journey time benefits to transport users
- Journey time reliability benefits
- Accident benefits

It can be concluded from this assessment that the Warrington East Phase 2 scheme produces a **Strong Value for Money** case.

18.15 Wider Economic and Land Use Benefits

18.15.1 Introduction

Sections 18.1-18.14 have addressed the economic appraisal process covering the assessment of transport user benefits, environmental impacts, network reliability and the wider impacts as defined by the DfT in WebTAG 2.1. However, it is important to recognise that schemes can generate wider economic benefits beyond those specified above, particularly in relation to job creation and Gross Value Added (GVA) uplift as a result of unlocking land for development.

Warrington East Phase 2 has been identified as an enabler and catalyst for development in east Warrington through its ability to bring forward development and support economic growth, therefore, this section examines the wider economic benefits associated with the scheme in terms of additional jobs and GVA, the potential for Warrington East Phase 2 to support the delivery of housing and employment sites in east Warrington.

18.15.2 Land Use and Economic Development Wider Benefits Methodology

The Wider Economic benefits (WEBs) of this scheme have been assessed, at the Warrington Borough Level by reviewing potential changes in land use as a result of Phase 2 of the Warrington East scheme, supporting development, and calculating the associated economic

[29] Value for Money Assessment: Advice Note for Local Transport Decision Makers, Department for Transport https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267296/vfm-advice-local-decision-makers.pdf

impacts (jobs, GVA[30] and housing related impacts) using Mott MacDonald's Transparent Economic Assessment Model (TEAM).

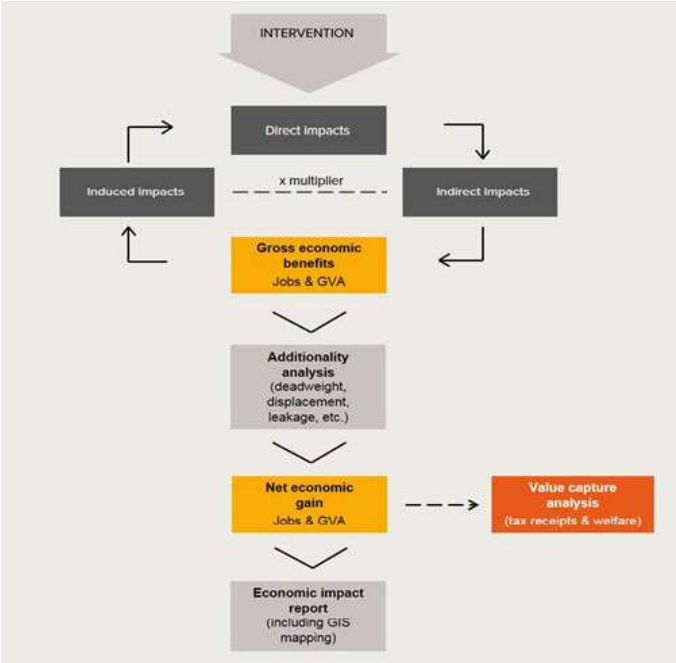
More specifically the method has entailed:

- A review of the strategic economic context in terms of economic and land use policies and how development in east Warrington will help delivering economic growth in terms of jobs and housing;
- Consultation with representatives of WBC and Warrington & Co, the business unit of WBC, on the proposals for the sites in the area around Warrington East Phase 2 scheme on broader economic issues that could impact the assumptions made as part of this WEB assessment;
- Quantitative assessment of the gross and net economic benefits (focusing on jobs and GVA) associated with the Warrington scheme using TEAM; and
- The GVA benefits are then shown over a 30-year time horizon (at Net Present Value, at a discount rate of 3.5% per annum) from the beginning of the anticipated construction period of the modelled employments sites.

TEAM assesses the economic benefits arising from land-use change calculated in-line with HM Treasury Green Book principles of additionality. It is also aligned to draft WebTAG guidance on supplementary economic modelling (TAG Unit M5.3) where it reflects the 'Additionality Modelling' approach.

TEAM uses Office of National Statistics (ONS) datasets alongside bespoke local area analysis, in this case for the North West and Warrington borough to inform specific assumptions. TEAM operates as follows:

Figure 52: TEAM model



Source: Mott MacDonald

[30] Gross Value Added (GVA) is a measure of productivity, it is the sub-national equivalent of Gross Domestic Product (GDP), with taxes and subsidies excluded. GVA is produced by all private sector jobs to varying degrees and the value of jobs can vary between geographic areas. The analysis presented in this appendix uses ONS data on GVA per worker in the North West of England.

The net economic gain to Warrington from land use changes from the Warrington East Phase 2 is captured by adjusting the gross impacts for additionality, that is "the net, rather than (the gross impact of an intervention) after making allowances for what would have happened in the absence of the intervention"[31]. The assessment therefore adjusts the gross impacts by considering the following additionality assumptions.

- Deadweight: the level of economic activity that would have occurred without the intervention.
- Leakage: the level of benefits (e.g. Jobs at this site that are likely to go to residents outside of Warrington).
- Displacement: the proportion of economic benefits that are displaced from elsewhere (e.g.: through relocation of business activities to the Warrington East Phase 2 site)
- Multiplier impacts: knock on impacts within the economy from supply linkages due to purchases made as a result of the intervention and further purchases with linked firms along the supply chain (indirect effects) and income effects associated with local expenditure as a result of those who derive incomes from the direct and supply linkage impacts (induced effects).

18.15.3 Housing and Employment Site Selections

In order to assess the WEBs of this scheme, local development sites were selected from current planning documents produced by WBC and agreed in consultations with WBC officials and representatives of Warrington & Co.

The sites included in the assessment are set out in Table 36 and Table 37. The locations of the sites are shown in Figure 53.

Table 36: Employment Sites

Site name	Site size (floorspace, m2)	Proposed land use
The Quadrant	12, 225	B2/B8
Site 381	72,089	B2/B8

Source: WBC, EDNA, 2016

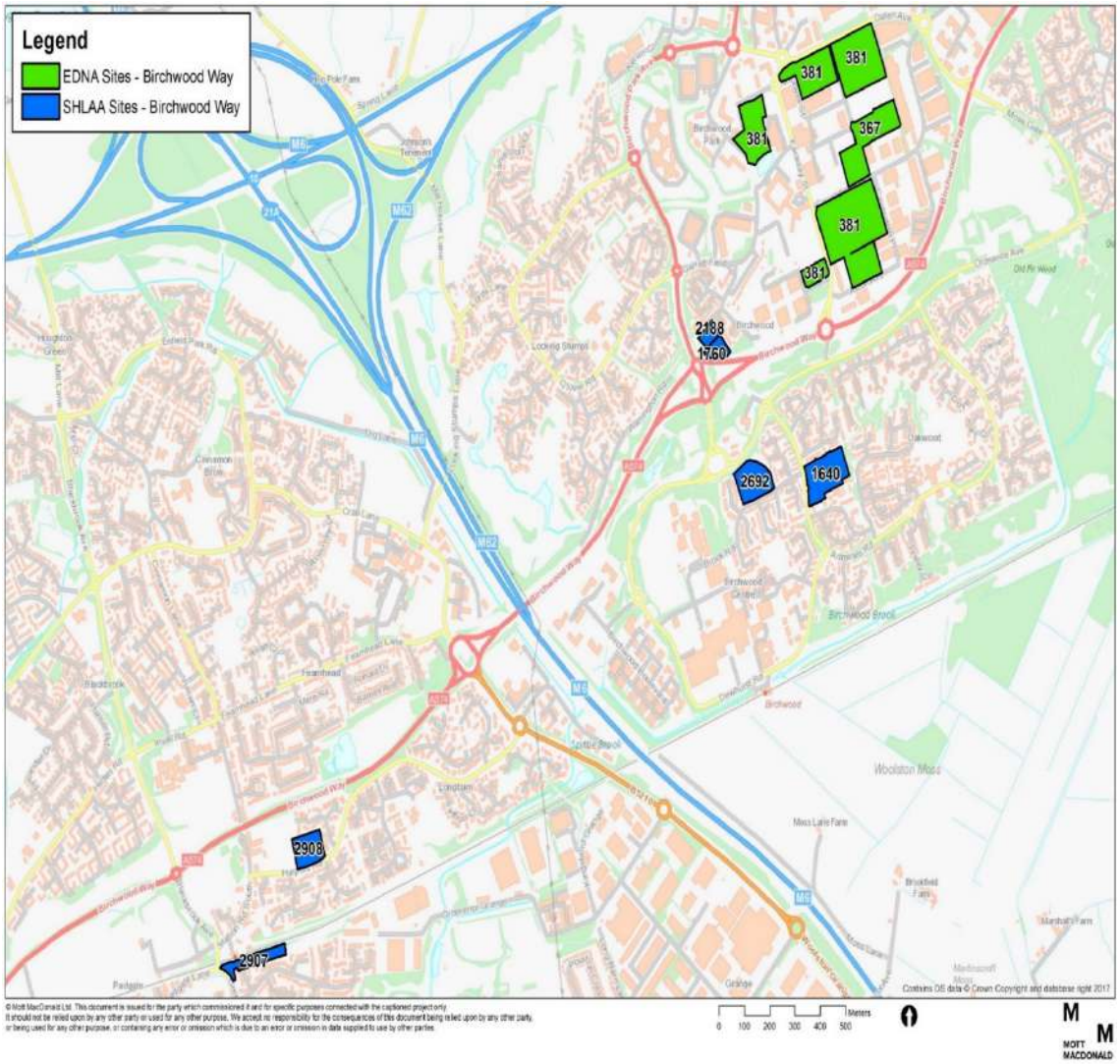
Table 37: Housing Sites

SHLAA reference	Capacity
1640	66
1760	9
2188	8
2692	23
2907	31
2908	93
Total	230

Source: WBC, SHLAA, 2017

[31] The Green Book, HM Treasury, p.52

Figure 53: Warrington East Phase 2 Development Sites



Source: Mott MacDonald

18.15.4 Land Use and Economic Development Wider Benefits Findings

18.15.4.1 Additionality assumptions

Calculated impacts are adjusted for additionality. TEAM was used to model the potential net additional impact with these developments can bring to Warrington (the target area). The level of additionality for the sites has been adjusted using the following assumptions to determine the net additional impacts:

Table 38: Assumptions used

Assumption	Justification
Displacement- 25%	An assumption of 25% of displacement was selected in line with the HCA Additionality Guide[32] which advises 25% as a 'low' level of displacement. This low level of displacement has been selected as data provided by Warrington & Co. and WBC shows a supply of available employment land, suggesting that current businesses do have the option to relocate from Warrington but generally do no.
Leakage- 49%	The figure of 49% leakage is based on travel-to-work data from the 2011 UK Census, which shows that 49% of the jobs in Warrington are held by people who live outside of the town.
Deadweight- 90%	Deadweight provides an estimate of the proportion of benefits likely to occur without a given intervention being made. It is not possible to accurately state what proportion of benefits are likely to occur without an intervention as there are many factors that can influence development and the future demand for employment sites. To factor in deadweight, as a substitute for a counter-factual 'do minimum' scenario, a judgement must be made as to what development is likely to occur without this scheme based on the logic chain through which the benefits are anticipated to derive. This scheme is anticipated to support the development of two remaining employment sites at Birchwood Park by reducing congestion and increasing access around the park, enabling greater access between the park and the motorways located nearby. Whilst this scheme is a possible intervention that has the potential to make these sites more attractive to businesses and developers, it is likely that a range of other factors will also impact the development of these sites. Other factors such as the performance of the companies themselves and the willingness of local developers to bring forward construction of these sites is likely to have a greater impact on whether these sites come forward than this scheme. To reflect the high probability that these sites will be delivered without being dependant on this scheme, a deadweight of 90% has been selected. This acknowledges the high probability of another factor being more significant in bringing these sites forward and reflects an attribution of 10% of these benefits from delivering these sites directly to this scheme.
Composite multiplier- 1.29	A composite multiplier of 1.29 has been applied, in accordance with the HCA's Additionality Guide 2014. This incorporates the likely multiplier effects within the economy from: • Supply linkages due to purchases made because of the intervention and further purchases associated with linked firms along the supply chain (indirect effects). and, • Income or induced effects associated with local expenditure because of those who derive incomes form the direct and supply linkage impacts of the intervention. • The multiplier models the indirect and induced economic impacts. This composite multiplier includes a supply linkage multiplier relating to purchases made because of the intervention and a consumption multiplier based on the expenditure of those whose incomes derive from the direct and supply linkage impacts of the intervention.
GVA per worker (2016 prices) £56,212	The GVA figure is taken from data released in February 2018 by the ONS, 'Regional and Subregional Productivity', February 2018. This data is the GVA per filled job for the Cheshire and Warrington LEP, across the whole economy in 2016. This is the basis for an estimate of potential gross GVA impacts.
Employment Density- various	• B2 (Industrial and manufacturing) 36m2 of NIA/FTE- This is the assumption that one FTE job is generated for ever 36m2 of B8 employment space, in Gross Internal Area (GIA). • B8 (Regional and Distribution centre) 77m2 of Gross External Area (GEA) FTE – This is the assumption that one FTE job is generated for every 77m2 of B8 employment space, in GEA. These assumptions are based on the HCA employment Density Guide 2015.

Source: Mott MacDonald

18.15.5 Delivery trajectory and Net Present Value (NPV) analysis

Through consultations with WBC and Warrington & Co and with transport modellers working on this study, an appropriate and realistic build-out rate was selected to show the impact of these sites being brought forward over a longer period. Based on the likely build-out rate that could be

[32] HCA, Additionality Guide, 2014

delivered based on modelled traffic flows in this area, we have assumed a phased build-out rate, beginning in 2019, building up over ten years to 2028.

The GVA benefits of the employment sites were then forecast over a 30-year appraisal period. This 30-year period has been applied in similar studies and has been accepted for the appraisal of the WEBs associated with major transport schemes in two separate public inquiries involving Mott MacDonald: the Norwich Northern Distributor Road; and, the Postwick Hub scheme. The 30-year appraisal period is shorter than standard WebTAG 60-year appraisal periods but is thought to better reflect the physical lifespan of modern employment space and the business owners occupying them.

In line with guidance from TAG Unit A1.1, and annual discount rate of 3.5% has been applied to generate the NPV of the GVA benefits anticipated to be generated by this scheme. In addition, this NPV has been calculated in 2016 prices. Over a 30-year appraisal period with the first jobs on these sites being delivered in 2019, with all modelled permanent jobs (not including temporary construction jobs) delivered by 2028, the NPC (in 2016 prices, 2018 vales) totals £59.01m.

18.15.6 Council tax benefits

Housing development will result in additional council tax which is estimated to be in the range of £270,000 per annum based on the following assumptions:

- Average house price of £163,00 using the latest average house price for Warrington (ONS).
- Council tax bands by house value and band rates for Warrington.

Business rates for employment land supported by this scheme would typically be included in this section. However, as the employment sites modelled for this scheme are inside the enterprise zone, they are unlikely to pay the total could tax that would typically be due on that land.

18.15.7 Wider Economic Benefits Summary

The analysis carried out on the Wider Economic Benefits found Warrington East Phase 2 to be capable of supporting:

- A total of **78 net additional jobs**
- **£4.2m** of net **additional GVA** per annum

In addition to this, the construction of 230 homes could generate a temporary economic impact of:

- **28 temporary construction jobs**
- Approximately **£3.2m of GVA per annum** during the **construction period**.

The tax impact of developing these sites to WBC is:

- Approximately **£270,000** in additional **council tax each year**.

The **total value of this intervention in GVA, modelled over 30 years**, in 2016 prices, discounted to 2018 is an NPV of **£59.01m.**

This demonstrates that this scheme could have a significant impact in supporting the development of Birchwood Park and additional housing in the Birchwood area, helping to meet the local growth objectives of both Cheshire and Warrington Local Enterprise Partnership (LEP) and WBC.

18.16 Social and distributional impacts

18.16.1 Social Impact Appraisal

To support the development of the interim MSBC a Social Impact Appraisal (SIA) has been carried out for the preferred options which is included as Appendix K to the interim MSBC. The SIA asses the human experience of the scheme and its impact on social factors.

It is assessed that the scheme will have the greatest beneficial impact on physical activity, journey quality, accidents, security and severance. The following table provides a summary of the appraisal.

Table 39: SIA conclusions of key impacts

Impacts		Summary of key impacts	Assessment		
			Quantitative	Qualitative	Monetary £(NPV)
Social	Physical activity	Introduction of shared cycle/footways is likely to help increase in take up of cycling and walking, leading to increase physical activity.		Slight beneficial	
	Journey quality	Driver stress is likely to improve due to reduced congestion, particularly during the AM and PM peaks. Safety features such as crash barriers, reduced vegetation and the refreshing of lane markings are likely to reduce the fear of potential accidents for motorists. There may be some route uncertainty following construction, but this is likely to be temporary.		Slight beneficial	
	Accidents	The Scheme will lead to an overall reduction in accidents, through measures to reduce pedestrian and cyclist interaction with motorised traffic and safety features such as crash barriers, reduced vegetation and the refreshing of lane markings.		Slight beneficial	
	Security	Lighting improvements and a reduction in vegetation are likely to improve security.		Slight beneficial	
	Access to services	N/A			
	Affordability	N/A			
	Severance	Reduced severance due to the introduction of toucan crossing and other pedestrian/cycling crossings.		Slight beneficial	
	Option and non-use values	N/A			

Source: Mott MacDonald

18.16.2 Distributional Impact Appraisal

Results to follow WC 25/02/18

Financial Case

Section 19

19 Financial Case

The Financial Case outlines the affordability of Warrington East Phase 2, its funding arrangements and technical accounting issues; value for money is scrutinised in the Economic Case. The case presents the financial profile of the scheme and an overview of how the scheme will be funded.

19.1 Introduction

The DfT's guidance document, '*The Transport Business Case: Financial Case'*, outlines the areas that should be covered as part of the Financial Case; this has been used as a broad guide in developing the structure and content of this interim MSBC. Table 40 shows where the information on required content can be found in this document.

Table 40: Compliance with DfT requirements for the Financial Case

Content	DfT requirements	Section number and title
Introduction	Outline the approach taken to assess affordability	19.1 Introduction 19.2 Methodology
Costs	Provide details of: • Expected whole life costs • When they will occur • Breakdown and profile of costs by those parties on whom they fall • Any risk allowance that maybe needed (in the event of things going wrong)	19.3 Base costs 19.4 Quantified risk
Budget/Funding Cover	Provide analysis of the budget/ funding cover for the project. Set out, if relevant, details of other funding sources (e.g. third-party contributions, fees)	19.5 Funding arrangements
Accounting Implications	Describe expected impact on organisation's balance sheet	19.6 Accounting implications

Source: DfT

19.2 Methodology

The indicative estimated cost for the Warrington East Phase 2 scheme is £13,355,000. Scheme costs have been developed based upon the designs included in Section 17 of this interim MSBC, in the OAR and in the scheme drawings.

The scheme cost is considered proportionate and affordable to the scale of the issues identified in the Strategic Case and the predicted benefits of the scheme as assessed in the Economic Case. Assumptions

Key assumptions made with regards to deriving scheme costs include:

- The project began in 2016/17 and is expected to be completed by 2020/21at the latest
- An opening year of 2020

19.3 Base costs

Indicative costs of the Warrington East Phase 2 scheme have been produced by Balfour Beatty; these are due to be updated and finalised in March 2018. These indicative costs can be found in the table below:

Table 41: Base costs exclusive of any risk allowance

Cost Item	Preferred Option Package
Land acquisition etc.	£37,000
Professional fees	£1,285,505
Statutory undertakings	£724,757
Works	£9,500,537
TOTAL	**£11,547,799**

Source: Warrington Borough Council

An amount of £590,000 to account for inflation has been accounted for in the above cost estimates in accordance with the Tenders Price Index and RPI. This was calculated by applying a midpoint inflation rate as at February 2019 (8.5%) to the construction cost of around £6.9m.

The base cost estimates include the following:

- **Construction costs** consisting of:
  - Main works contract (preliminaries, structures, road works, general works, earthworks)
  - Ancillary work contracts (maintenance compounds, lighting, communications, landscaping, noise insulation)
  - Works by other authorities (including local authorities' works, statutory undertakers' works).
- **Land costs**: This includes the acquisition and legal transaction costs for all the required private and commercial land, and additionally accounts for property management costs and compensation.
- **Preparation costs:** This consists of all project management, consulting engineers and agent authority fees to cover the elements of survey requirements, preliminary design, public consultation, public inquiry, and the costs of obtaining statutory orders.
- **Supervision costs:** This accounts for on-site supervision and testing of scheme elements prior to scheme opening.

The cost estimate is based upon the assumption that the full package of measures will be delivered by 2020

19.4 Quantified risk

Quantified risk assessment (QRA) enables an expected value of the cost of the scheme to be calculated. Balfour Beatty undertook a risk assessment and produced a risk register which identifies 41 risks. They have been categorised as either:

- Programme
- Design
- Cost
- Health, safety & environment

Balfour Beatty quantified each risk based on the probability of it occurring and the severity of the impact, should it occur, resulting in an indicative QRA of £1,651,073. This is approximately 17% of construction (Works) cost.

19.5 Scheme costs adjusted for risk

Table 42 provides a cost estimate adjusted for risk. It uses the calculated base costs, risk allowance (QRA value of £1,651,073) to give a total scheme cost.

Table 42: Scheme costs adjusted for risk

Cost Item	Preferred Option Package
Land acquisition etc.	£37,000
Professional fees	£1,285,505
Statutory undertakings	£724,757
Works	£9,500,537
Sub- total	**£11,547,799**
QRA	£1,651,073
Total	**£13,198,872**

Table 43 shows the annual spend profile. The amount for quantified risk has been proportionally allocated to the Works cost item, in accordance with the level of spend on Works each year.

Table 43: Annual spend profile

Cost Item	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Land acquisition etc.		£27,000	£10,000			**£37,000**
Professional fees	£205,729	£842,897	£165,129	£45,000	£26,750	**£1,285,505**
Statutory undertakings		£428,7354	£296,022			**£724,756**
Works	£20,855	£141,916	£6,475,878	£3,084,156	£1,428,806	**£11,151,611**
Total	**£226,584**	**£1,440,547**	**£6,947,029**	**£3,129,156**	**£1,455,556**	**£13,198,872**

Source: Warrington Borough Council

19.5.1 Maintenance costs

WebTAG Unit A1.2 (Scheme Costs) states that traffic-related maintenance and renewal costs should also be considered in addition to capital investment costs.

However, as costs are currently indicative, maintenance costs have not been included at this time. Maintenance costs will become part of the maintenance and operations costs for the transport networks of Warrington Council.

Likley maintenance costs will be for traffic signal replacements and road surfacing and will be calculated over a 60 year assessment period in accordance with WebTAG guidance.

19.5.2 Operating costs

WebTAG Unit A1.2 (Scheme Costs) states that traffic-related operating should also be considered in addition to capital investment costs. Operational costs of Warrington East Phase 2 are being given consideration and will be included when final scheme costs are known, though it is expected that they are likely to be quite low.

19.6 Funding arrangements

The table below shows the funding split, over the project lifetime by funding source.

Table 44: Warrington East Phase 2 Funding profile

Funding source	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Local growth Fund	£117,067	£744,274	£3,589,255	£1,616,711	£752,028	**£6,819,335**
WBC borrowing	£67,101	£426,609	£2,057,319	£926,680	£431,054	**£3,908,763**
Enterprise Zone	£33,933	£215,731	£1,040,364	£468,612	£217,979	**£1,976,619**
Private sector	£8,483	£53,933	£260,091	£117,153	£54,495	**£494,155**
TOTAL	£226,584	£1,440,547	£6,947,029	£3,129,156	£1,455,556	**£13,198,872**

Source: Warrington Borough Council

Following a meeting of the WBC Executive Board in April 2017, the totals shown above for each funding contributor were rounded up as shown in table 45 to provide an overall funding figure of £13,355,000.

Table 45: Warrington East Phase 2 Funding profile

Funding source	Original Total	Total as agreed by WBC Executive Board
Local growth Fund	£6,819,335	**£6,900,000**
WBC borrowing	£3,908,763	**£3,955,000**
Enterprise Zone	£1,976,619	**£2,000,000**
Private sector	£494,155	**£500,000**
TOTAL	£13,198,872	**£13,355,000**

Source: Warrington Borough Council

19.7 Accounting implications

Tables 44 and 45 present the total project costs including interest on borrowing; the PWLB rate for borrowing over 25 years is 2.74%

Commitment to funding at conditional approval stage was approved by the April 2017 Executive Board. The April 2018 Executive Board report will approve the funding package including the underwriting of funding for the Enterprise Zone and private sector contributions.

The Executive Board approval is the equivalent to Section 151 Officer sign off.

Commercial Case

Section 20

20 Commercial Case

This section sets out the Commercial Case for Warrington East Phase 2 scheme and provides evidence on the commercial viability of the proposal and the procurement strategy that will be used to engage the market.

Here, risk allocation and transfer, contract timescales and implementation timescales, capability and skills of the team delivering the project and personal implications from the proposal are all documented.

20.1 Approach to development of the Commercial Case

The DfT's guidance document sets out the issues that should be covered as part of the Commercial Case. This has been used as a basis for our approach to development of our Commercial Case, allowing for proportionality in respect of the scheme cost.

Table 46 shows how this section aligns with DfT's requirements.

Table 46: **DfT Commercial Case requirements**

Content	DfT requirements	Section number and title
Introduction	Outline the approach taken to assess commercial viability.	20.1 Approach to the development of the Commercial Case
Output based specification	Summarise the requirement in terms of outcomes and outputs, supplemented by full specification as appendix.	20.2 Output based specification
Procurement strategy	Detail procurement/purchasing options including how they will secure the economic, social and environmental factors outlined in the economic case	20.3 Procurement strategy
Sourcing options	Explain the options for sources of provision of services to meet the business need e.g. partnerships, framework, existing supplier arrangements, with rationale for selecting preferred sourcing option.	20.4 Procurement options
Payment mechanisms	Set out the proposed payment mechanisms that will be negotiated with the providers e.g. linked to performance and availability, providing incentives for alternative revenue streams. (See the Office for Government Commerce's Achieving Excellence briefing for advice on payment mechanisms for construction projects.)	20.5 Payment mechanisms
Pricing framework and charging mechanisms	To include incentives, deductions and performance targets.	20.6 Pricing framework and charging mechanisms
Risk allocation and transfer	Present an assessment of how the types of risk might be apportioned or shared, with risks allocated to the party best placed to manage them subject to achieving value for money.	20.7 Risk allocation and transfer
Contract length	Set out scenarios for contract length (with rationale) and proposed key contractual clauses.	20.8 Contract length
Human resource issues	Personnel/people management/trade union implications, where applicable, including TUPE regulations.	20.9 Human resource issues
Contract management	Provide a high-level view of implementation timescales. Detail additional support for in service management during roll-out / closure. Set out arrangements for managing contract through project / service delivery.	20.10 Contract management

Source: DfT

20.2 Output based specification

The Commercial Case shows how procurement and commercial viability of the project will enable scheme delivery. In order to deliver the scheme outcomes, a procurement strategy and methodology is required that delivers the following:

- **Cost Certainty** - Achieve cost certainty, or certainty that Warrington East Phase 2 can be delivered within the funding constraints. There is a fixed amount of funding available from the LGF and Birchwood Enterprise Zones, with the remainder being contributed by Warrington Borough Council. All risks on cost overrun remain with Warrington Borough Council Procurement method and sourcing options.
- **Minimise Costs** - Minimise preparation costs in regard to scheme design and minimise construction delivery costs.
- **Programme** - Achieve an efficient delivery programme, which began in 2016/17 and will enable on site construction in 2018/19 with completion by 2021.
- **Quality-** Achieve appropriate quality of design and end product.
- **Continuity of Project Knowledge** - Maintain project knowledge to support scheme design and successful rebuttal of any project challenge. The knowledge of the scheme and associated issues and constraints, generated through the development of the interim MSBC, is seen as an asset that will help enhance quality of delivery and achievement of programme.
- **Risk** - Obtain contractor input to risk management and appraisals, including mitigation measures, to capitalise at an early stage on opportunities to reduce construction risk and improve outturn certainty thereby reducing risks to a level that is as low as reasonably practicable.
- **Deliverability** - Engagement with contractors and stakeholders throughout planning to scheme delivery to support development of buildable and deliverable proposals.

These are the criteria by which procurement strategies and methods have been assessed and the subsequent sections below detail the results of this assessment.

20.3 Procurement strategy

Procurement is an integral part of the project management process. The procurement strategy has been designed to ensure:

- Value for Money: WBC is under a duty to secure value for money in all of its transactions
- Compliance with legislation: a wide variety of UK and European Union statutes and regulations apply to procurement
- Avoidance of fraud and corruption: procurement must be visible and tightly controlled to limit potential fraud and avoid any suggestion of corruption
- Delivery of WBC's visions and ambitions: procurement contributes directly to the delivery of the WBC's vision and long-term ambitions

The section sets out the in-principle strategy for procurement of consultant and contractor services to deliver the Warrington East Phase 2 scheme. Consultant services extend to design and advisory services to WBC, and contractor services include construction of the scheme.

20.4 Procurement options

A number of procurement options were considered for the Warrington East Phase 2 scheme, these are set out below alongside the advantages and why they were discounted.

- Design and construct
- Early contractor involvement
- SCAPE national civil engineering and infrastructure framework 2015
- Open invitation to tender (OJEU procurement) to select a single contractor for all works
- Private finance initiative
- Use of a PQQ to produce a bespoke framework of contractors
- Other open framework agreements
- Mini competition among suppliers on the North West Construction Hub Framework

Table 47: **Alternative procurement options**

Option	Advantages	Why discounted
Design and construct	• Established forms of contract are available. • Risks can be transferred to the contractor • Less scope for variations in design	• Contractor risks are higher and may raise the price of the contract.
Early contractor involvement	• Improved risk management and buildability through early contractor involvement • Risks can be transferred to the contractor • Early interception of contractor experience	• A higher level of certainty is required over the schemes funding before a contractor can be involved. • Involves open book cost management and in-house skills to manage • Target cost for the main construction works is generally negotiated rather than competitively tendered, which may impact on the value for money of the construction contract.
SCAPE national civil engineering and infrastructure framework 2015	• Balfour Beatty is a nationally recognised contractor • Nationally competitively tendered framework on fixed overheads, profit and preliminaries basis; • Ability to leverage same advantages of ECI; however, with only one supplier (Balfour Beatty • Financial and time savings that are achieved by not having to carry out a protracted OJEU procurement exercise; • Balfour Beatty have rich experience working with Warrington Borough Council • SCAPE procures a significant volume of projects and services enabling the framework to command highly competitive and fixed rates.	• This procurement option has been taken forward.
Open invitation to tender (OJEU procurement) to select a single contractor for all works	• A large amount of flexibility is present with this option as Warrington Borough Council can determine the contractor requirements and award criteria.	• A full OJEU procurement procedure would take a significant amount of additional time post-business case approval.
Private finance initiative	• No large upfront capital costs are required to construct the scheme. • Construction and maintenance risks can be transferred to the private sector. • Costs of the scheme can be distributed over the lifespan of the scheme. • The contractor would have a long-term interest in the quality of the scheme build and design given ongoing maintenance liabilities.	• PFI contracts are typically greater than 25 years with annual repayments plus interest placing a long-term future liability/burden on the Council.
Use of a PQQ to produce a bespoke framework of contractors	• Work can be distributed across a number of contractors, this enables to capitalise on contractor's different specialities and resources.	• The extent of the works is deemed unlikely to stretch the resource limitations of one contractor. • For the purposes of coordination of

Option	Advantages	Why discounted
		schemes and traffic management a single contractor is preferable.
Other open framework agreements	• Various consultants would be used to provide multi-disciplinary technical advice. • This framework is widely used by Warrington Borough council for the initial stages of project development.	• There is absence of a single framework to provide a full range of services
Mini competition among suppliers on the North-West Construction Hub Framework	• A group of shortlisted suppliers can offer fewer procurement risks than open tender.	• Any cost savings from a mini competition are deemed unlikely to be high enough to warrant the lengthier procurement period compared to the use of the SCAPE framework.

Source: Mott MacDonald

20.4.1 Preferred Procurement Option

Based on the above assessment, Warrington East Phase 2 will utilise two sourcing frameworks, one for consultancy services and one for construction:

- Transportation and Public Realm Consultancy Services Framework 2013
- SCAPE National Civil Engineering and Infrastructure Framework 2015

More detail is provided on these Frameworks in the sub-sections below

20.4.2 Transportation and Public Realm Consultancy Services Framework 2013

The Transportation and Public Realm Consultancy Services Framework (TPRCSF) is a common procurement route for services within the council. The framework has been established since 2014 and enables quick and efficient provision of expertise up to value of the OJEU funding limits.

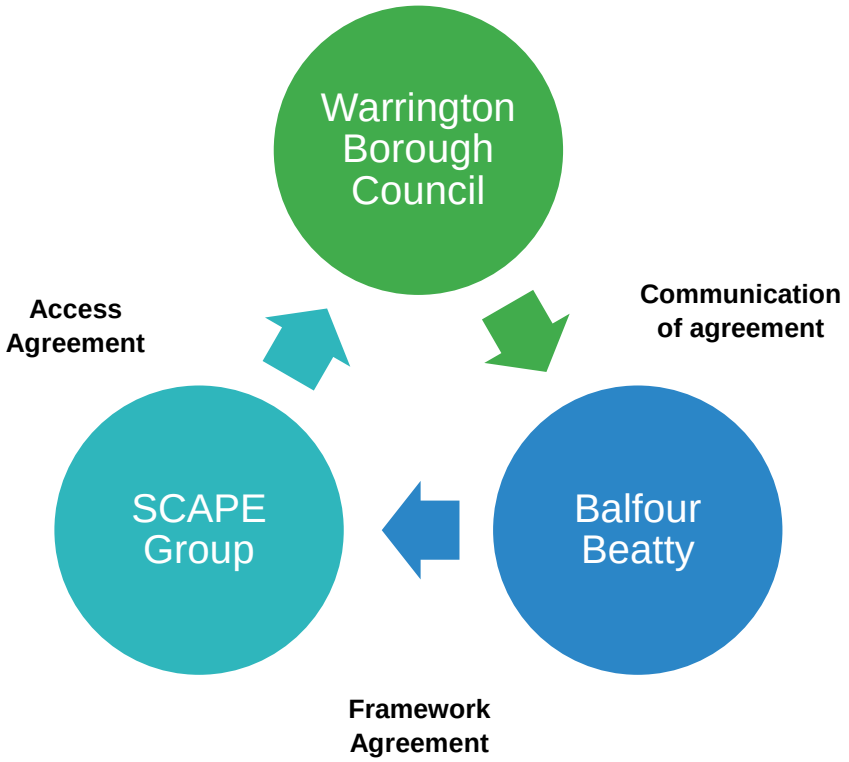
The TPRCSF consists of a group of approved consultants who may be utilised for multi-disciplinary professional and technical advice, design, guidance, negotiation and assistance on transport, construction and public realm projects. Under the TPRCSF, several leading transport consultants are listed. For Warrington East Phase 2, several consultants have been selected from the framework for their services and they subsequently form part of the project team, this includes:

- Concept design & business case development
- Scheme appraisal
- Flood risk
- Stakeholder Management

20.4.3 SCAPE National Civil Engineering and Infrastructure Framework 2015

The preferred procurement option taken forward for the Warrington East Phase 2 Scheme is to use the National Civil and Engineering and infrastructure Framework, managed by SCAPE Group Ltd, a local authority owned build environment specialist offering national and regional procurement frameworks. The Scape National Civil Engineering and Infrastructure Framework contains a single supplier, Balfour Beatty. The Framework has a cumulative value of £1.5bn, and will be in place until January 2019.

The schematic below demonstrates the overall mechanisms to facilitate use of the SCAPE framework.



The national SCAPE framework is a medium value construction framework that has consultants appointed across seven main lots, one consultant per lot. Balfour Beatty is the current appointee to the civil engineering framework lot. The framework allows project inputs to be staggered across three main gateways including:

1. Feasibility stage - provision of support relating to the development of feasibility design, costs, QRA and other up-front design works. Balfour Beatty provides this through the framework contract at zero cost
2. Pre-construction stage - Balfour Beatty needs to be formally engaged at this stage, appointed to take forward al the work necessary to produce a target (contract) price
3. Construction stage – a further formal appointment through the SCAPE framework where the construction contract is signed and the project taken on site and through to construction completion

The SCAPE framework has been selected as the preferred option as it possesses several advantages that alternative procurement options fail to display. The framework provides a strong balance of risk, control and cost certainty. Thus, overall enabling good value for money. The SCAPE framework offers a low-risk and established route to market. The framework also removes the need for Warrington Borough Council to conduct its own procurement processes as the SCAPE framework is already in place, with Balfour Beatty as selected SCAPE Group Ltd as the designated supplier. The SCAPE process map is shown in Figure 54.

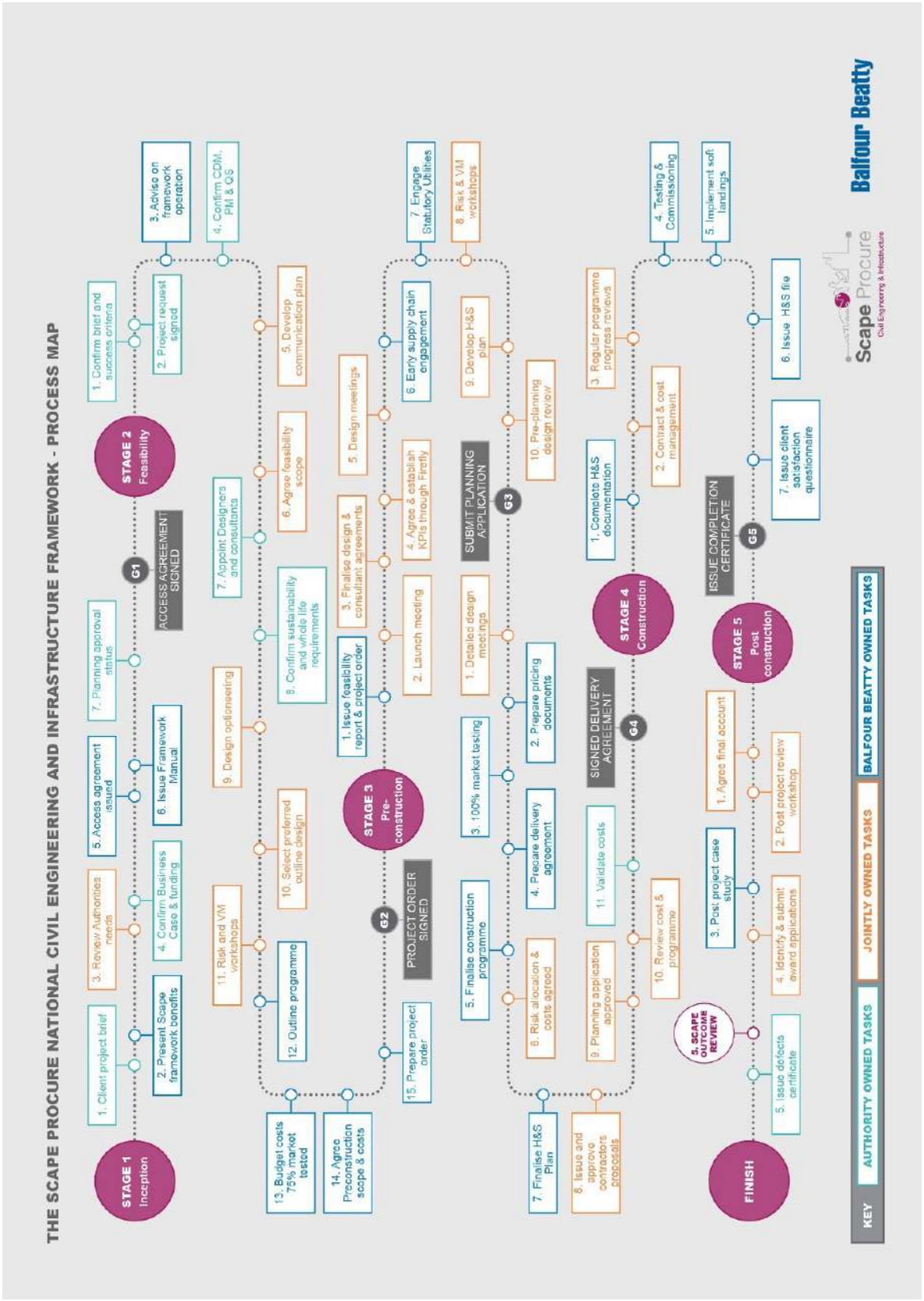
The framework allows the engagement of Balfour Beatty at each of the three stages noted above but does not preclude WBC from not progressing through each of the three gateway stages within the SCAPE Framework. WBC has the flexibility to place the scheme development on hold within the SCAPE Framework and progress with the project via other procurement Frameworks should situations arise that warrant this.

Balfour Beatty is a nationally recognised construction company with more than 100 years of experience in complex infrastructure projects. Balfour Beatty has extensive experience in the industry and in Warrington; Balfour Beatty delivered the successful Birchwood Pinch Point Project. The use of the SCAPE Framework allowed Warrington Borough Council and Balfour Beatty to demonstrate their ability to deliver under tight timescales. The success of previous highways projects within Warrington provides confidence over the budget and the working relationship between Warrington Borough Council and Balfour Beatty.

The success of the Birchwood Pinch Point Project (Warrington East Phase 1) provides assurance and confidence that Warrington East Phase 2 can be delivered through the SCAPE framework. Furthermore, the achievements that were accomplished with Phase 1 demonstrates the value that Balfour Beatty can offer in delivering infrastructure projects for WBC.

It should be noted that the framework selected for the Warrington East Phase 2 Scheme may be subject to change. At the time of writing, Warrington Borough Council's preference was to pursue the SCAPE framework, however this might possibly change though Business Case development.

Figure 54: SCAPE Process Map



Source: Balfour Beatty/SCAPE

20.5 Payment mechanisms

This section outlines the payment mechanisms and providers that have thus far been used to deliver Warrington East Phase 2, as well as those that will be adopted as the scheme moves forward. The scheme to date has primarily used two existing contracts.

- Transportation and Public Realm Consultancy Services Framework 2013
- SCAPE national Civil Engineering and Infrastructure Framework

Each of the payment mechanisms are outlined below.

20.5.1 Transportation and Public Realm Consultancy Services Framework 2013 (TPRCSF)

The TPRCSF was established in 2013 to give WBC access to five consultancies 'on demand' via a competitive bidding framework using Quotation Request Forms (QRF). The payment terms for the TPRCSF are in arrears within 30 days by invoice. WBC operate a preferential payment arrangement with ongoing suppliers, this entitles them to guaranteed payment within this period. All consultancies on the TPRCSF are on the preferential supplier list.

20.5.2 SCAPE National Civil Engineering and Infrastructure Framework 2015

The contract value for the delivery of Warrington East Phase 2 will be contained in the contract between WBC and Balfour Beatty. This will be completed once Warrington East Phase 2 passes through to Full Business Case and full funding from Warrington Borough Council and C&W LEP has been agreed.

Balfour Beatty are paid monthly and in return detailed invoices in accordance with the terms and conditions of the contract are submitted each month. Payment is processed between Warrington Borough Council and Balfour Beatty for the agreed services.

Funding provided by Cheshire and Warrington LEP will be filtered through to Warrington Borough Council who will then pay Balfour Beatty. Sufficient evidence of the expenditure on valid scheme delivery will be provided to Cheshire and Warrington LEP.

20.6 Pricing framework and charging mechanisms

This section outlines the potential pricing framework and charging mechanisms available under both the:

- Transportation and Public Realm Consultancy Services Framework 2013
- SCAPE national Civil Engineering and Infrastructure Framework

20.6.1 Transportation and Public Realm Consultancy Services Framework 2013

The TPRSF has an agreed pricing and charging mechanism within the contract to allow WBC to make informed decisions on which to engage consultants for service related to Warrington East Phase 2. Each consultant has provided rates for staff on a competitive basis that are eligible for RPI increases each April for the duration of the contract. The rates included in the contract vary by grade, including technical grades E1-4 and management grades M1-2.

20.6.2 SCAPE National Civil Engineering and Infrastructure Framework 2015

The SCAPE framework includes two main payment areas:

- Contractor and their agent payments

- SCAPE Procure Management Team payments

The fee for using the SCAPE framework is set at 0.5% of the total contract value (0.25% at Project Order; 0.25% at Delivery Agreement). The payments direct to the contractors or contractor's agents are determined based on fee quotations or the target contract cost. Balfour Beatty has provided a charging rates schedule to WBC.

In accordance with the SCAPE National Civil Engineering and Infrastructure Framework Schedule 10: Contractor's Fees, Working Area Overhead and People Costs, the following sections of the pricing framework are agreed between Balfour Beatty and Warrington Borough Council:

- Feasibility is to be completed free, with the exception of any required enabling works (paid as short form NEC contract) and PSC contracts (paid as NEC PSC Contracts)
- Pre-construction (ECI Phase) Balfour Beatty staff paid at pre-agreed rates, any required enabling works (paid as short form NEC contract) and PSC contracts (paid as NEC PSC Contracts)
- Model Delivery Agreement, paid as NEC Option A or Option C (client discretion):
  - Direct Fee and Subcontracted Fee percentage agreed at 2.5%
  - Working Area Overhead agreed at 9%
  - Working Area Overhead is calculated on all defined cost, not people
  - Staff rates are pre-defined for the build-up of the Option A or C Price (actual cost for option C from commencement)
- Regional adjustments to the staff people costs for the North West (-12.23%) to be applied to costs as agreed in accordance with Part 3 of Schedule 10

From the outset of the project, the contract will include a gain share/pain share incentive mechanism. This process will help ensure costs are kept to a minimum and benefits are shared equally among parties. The actual costs will be compared with the target cost and savings, or over expenditure, will be shared between Warrington Borough Council and the contractor.

An incentive scheme will also be put in place within the contract; Warrington Borough Council will inaugurate incentives for the contractor to deliver on time, as well as incorporating penalties for late delivery based on liquidated damages where financial implications for Warrington Borough Council can be evidenced. This process ensures both parties deliver best value for the project. The incentives for the schemes will be finalised following discussion with SCAPE Group Ltd and the framework contractor.

20.7 Risk allocation and transfer

This section sets out how the type of risk is shared amongst relevant parties for the Warrington East Phase 2 Scheme. It should be noted that a more detailed account of risk management can be found in Section 21.9 of the Management Case.

A scheme delivery risk workshop was undertaken with Warrington Borough Council in February 2017 to identify risks and mitigations and assess the likely level of impact in terms of both time and cost. The risk register has been subsequently updated at regular stages throughout the development of the project and forms the basis of the Quantified Risk Assessment (QRA).

The QRA sets out the scheme risks associated with Warrington East Phase 2on a quantified basis. The assessment identifies the key project risks which are recorded and updated continuously through the lifetime of the Warrington East Phase 2 Scheme. For each risk, a party has been selected and allocated management of the risk.

The key risks identified in the risk register that are relevant to the Commercial Case have been summarised in the table below.

Table 48: **Key risks identified in the risk register relevant to the Commercial Case**

Risk	Risk event	Consequence	Mitigation
Construction programme risk	The construction of the physical assets are not completed on time or to specification.	The asset delivered is either late or not of sufficient quality leading to delays whilst issues are rectified. Negative impact on achieving scheme benefits and loss of reputation for WBC	Set in place robust reporting and monitoring process during construction phases. Draft construction contract with appropriate share of programme risk. Appoint Clerk of Works to monitor quality and progress
Procurement risk	Procurement of services may not be successful or are delayed	The scheme is delayed or does not progress as a result of delays meaning the scheme can no longer be delivered within the funding timeframe	Ensure correct procurement routes are being followed and proactively liaise with potential providers to establish availability.
Cost risk	The scheme escalates in cost e.g. cost of materials and infrastructure	Warrington East Phase 2 client team would be required to investigate the provision of additional funds internally or via alternative sources. WBC required to cancel the scheme or agree to additional borrowing required to investigate the provision of additional funds internally or via alternative sources. WBC required to cancel the scheme or agree to additional borrowing	Ensure periodic cost reviews are held and ensure that value engineering is undertaken at key stages of the project
Provider risk	Sub-standard contractor performance	Scheme experiences delays during detailed design or construction due to inadequate performance or management of the D&B Contractor	Ensure that decision making members are well briefed on the reasons for the scheme and any opposition members are kept appropriately informed of the reasons and justifications for the scheme

Source: Mott MacDonald

Balfour Beatty have been assigned risks associated with estimations of the quantities, mitigation measures and resources. Warrington Borough Council will take responsibility for risks that are associated with land, planning and environmental permissions, including the responsibilities of land acquisition and obtaining planning approvals.

20.8 Contract length

The Warrington East Phase 2 scheme is currently expected to secure the Principal Contractor under the SCAPE National Civil Engineering and Infrastructure Framework. The contract expected to be signed with Balfour Beatty is a NEC3 contract and adopts a two-stage strategy.

Table 49: **Proposed contracts for use on Warrington East Phase 2**

Contract Type	RIBA Stage	Length
SCAPE national Civil Engineering and Infrastructure Framework 2015	Stage 3, 4 & 5[33]	24 months
Transportation and Public Realm Consultancy Services Framework 2013	Stage 3, 4 & 5	There have been ongoing multiple contracts in place since 2016/17 and this will continue through 2021,so a total of approximately 60 months However, the contract is due to be re-tendered in early 2018. Will be replaced with TPRSF 2018-2022

Source: Warrington Borough Council

In the Pre-Construction Phase, Balfour Beatty as the successful D&B Contractor through the SCAPE Framework has been appointed for early contractor involvement (pre-construction) with this work contracted between 2016/17 and 2021.

On completion of the Pre-Construction Stage and subject to receipt of full funding and planning approvals, Balfour Beatty would proceed to the Construction Stage (RIBA Stage 5) which includes construction of the scheme. The contract between WBC and Balfour Beatty includes a break clause between early contractor involvement phase, and the construction works if funding and statutory planning and environmental approvals are not obtained.

It is envisaged that the construction element of the contract will be approximately 24 months in duration with an anticipated contract start date in 2018/19.

20.9 Human resource issues

WBC will be responsible for oversight of the project on the client side of the delivery arrangement. The relevant professional activities to appropriately resource this aspect of the project include a Scheme Designer, Client Project Manager, a Road Safety Review, ITS Engineer and Planning Inputs. WBC will also appoint a client-side project management team to provide a necessary link to the internal WBC processes and teams.

There are no trade union or TUPE implications arising from this contract.

20.10 Contract management

The construction contract with Balfour Beatty is a NEC3 through the SCAPE National Civil Engineering and Infrastructure Framework 2015. The NEC suite of contracts are well understood and are a tried and tested set of contracts used on large scale construction schemes. In addition, the implementation of NEC contracts has resulted in major benefits for projects both nationally and internationally in terms of time, cost savings and improved quality. NEC contracts have been uniquely designed using the following three key unique characteristics:

- Proven contract arrangement with many projects successfully being delivered in terms of time, cost savings and improved quality
- NEC contracts facilitated a good working relationship between the two parties and enable good management of the project
- NEC contracts can be utilised in various commercial situations

[33] RIBA Stages 3, 4 and 5 refer to developed design, technical design and construction design, respectively.

The NEC contract has been developed and divided into two stages. The contract has a break clause following the pre-construction stage in order to provide a gap if the scheme is not approved due to funding difficulties. Secondly, the next stage, which incorporates construction and post-construction, are subject to approval in terms of planning, land and environment and provision of target costs.

It is anticipated that the contract will be managed by the Transport and Operations Section of Warrington Borough Council. There will be an internal project management team, including a project manager, a project engineer and a project planner. Delegated powers under the NEC contract will be passed onto the Senior Responsible Officer (SRO) and project management team to manage the day to day activities of the construction team. The SRO for the scheme is Dave Boyer.

There will be a dedicated engineer on site on behalf of the Council to oversee construction and ensure targets are maintained.

Management Case

Section 21

21 Management Case

The Management Case assesses whether a proposal is deliverable. It looks at the project planning, governance structure, risk management, communications and stakeholder management to establish if adequate resources are in place to ensure delivery on time, on budget and in accordance with specifications

21.1 Introduction

The DfT guidance document, '*The Transport Business Case: Management Case'*, outlines the areas that should be covered in the Management Case and these have been used as a broad guide to structure the development of the Management Case for Warrington East Phase 2. The DfT requirements are set out below together with the relevant sections of this report where they can be found.

Table 50: DfT requirements for the Management Case

Content	DfT requirements	Section number and title
Introduction	Outline the approach taken to assess if the proposal is deliverable.	21.1 Introduction
Evidence of similar projects	If possible, provide evidence of similar projects that have been successful, to support the recommended project approach. If no similar project approach. If no similar projects are available for comparison, outline the basis of assumptions for delivery of this project e.g. comparison with industry averages for this kind of work	21.2 Evidence of similar projects
Project dependencies	Set out deliverables and decisions that are provided/received from other projects.	21.3 Project/programme dependencies
Governance, organisational structures & roles	Describe key roles, lines of accountability and how they are resourced.	21.4 Governance
Assurance & approvals plan	Plan with key assurance and approval milestones.	21.5 Project assurance and approvals
Project plan	Plan with key milestones and progress, including critical plan.	21.6 Project delivery plan
Risk management strategy	Arrangements for risk management and its effectiveness so far.	21.9 Risk management
Communications and stakeholder management	Development communications strategy for the project.	21.11 Communications and Stakeholder management
Project reporting	Describe reporting arrangements.	21.12 Project reporting
Implementation of work streams	Summary of key work streams for executing the work.	21.7 Implementation of work streams
Key issues for implementation	Issues likely to affect delivery and implementation.	21.8 Key issues for implementation
Contract management	Summarise outline arrangements. Confirm arrangements for continuity between those involved in developing the contract	21.10 Contract management

Content	DfT requirements	Section number and title
	and those who will subsequently manage it.	
Benefits realisation plan	Set out approach to managing realisation of benefits.	21.13 Benefits realisation
Monitoring and evaluation	Summarise outline arrangements for monitoring and evaluating the intervention.	21.14 Monitoring and evaluation
Contingency plan	Summarise outline arrangements for contingency management such as fall back plans if service implementation is delayed.	21.15 Contingency plan
Conclusion	Summarise overall approach for project management at this stage of project.	21.16 Conclusion

Source: Department for Transport, The Transport Business Case: Management Case

21.2 Evidence of similar projects

Warrington Borough Council has had proven success in a number of highways projects. Table 51 provides a summary of the most relevant the sub sections below provide more detail.

Table 51: Evidence of similar projects

Project	Cost	Delivered on time	Delivered to budget
Warrington East Transport Strategy Phase 1: Birchwood Pinch Point	£5.23 million	Yes	Yes
M62 Junction 8	£12 million	In progress but on schedule	In progress but on target

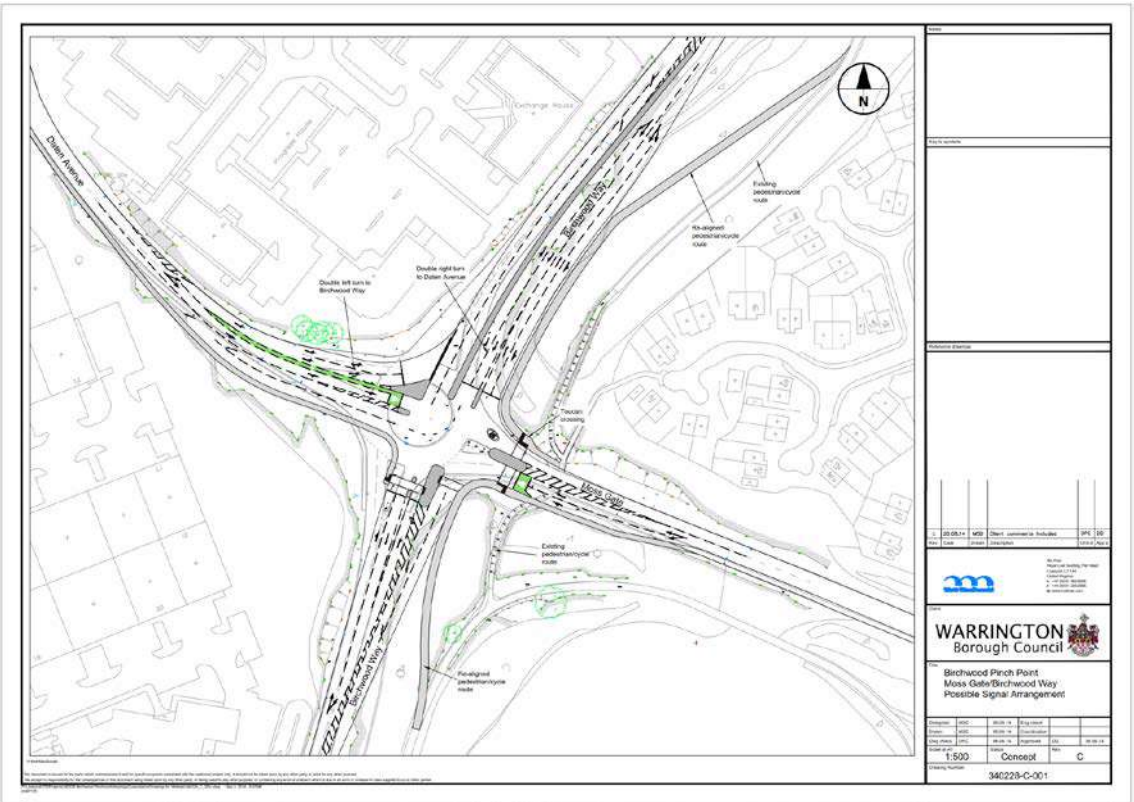
21.2.1 Warrington East Transport Strategy Phase 1: Birchwood Pinch Point

This project consisted of several junction improvements along the A574 Birchwood corridor at the Oakwood and Moss Gate roundabouts. The scheme also included a new bus only link between Ordnance Avenue and Faraday Street. The junction improvements elements of the scheme were opened to traffic in March 2016 and the bus only link was first used by bus services in July 2016. Against a budgeted cost of £5.23 million, the scheme outturned at £5.0 million.

The scheme was delivered through funding obtained from the growth deal from the Cheshire and Warrington LEP, as well as local contributions from Warrington Council and Birchwood Park. The project was delivered by Balfour Beatty and managed through the SCAPE National Civil Engineering and infrastructure Framework.

The project facilitated an increase in road capacity and eased congestion for 10,000 vehicles that travel through the junctions each day. The project also improved accessibility for pedestrian and cyclists and included a new bus only link which has improved bus accessibility and efficiency in Birchwood. The project had a strong emphasis on economic development, with the scheme successfully providing improved local traffic conditions which have helped to attract more small and medium enterprises to the Birchwood area.

Figure 55: Birchwood Pinch Point scheme design



Source: Mott MacDonald

Relevance to Warrington East Phase 2:

Warrington East Phase 2 will build on the success of Phase 1 by making additional enhancements at both Oakwood and Moss Gate as well as at College Place, further west along the A574 corridor.

Phase 1 was delivered by Balfour Beatty and successfully managed through the SCAPE National Civil Engineering and Infrastructure Framework which is the procurement option recommended for delivery of Phase 2; this established relationship provides assurance and confidence that this scheme can also be delivered successfully.

Additionally, WBC's experience in delivering Phase 1 demonstrates the Council's ability to:

- Identify and deliver a major engineering project on a busy highway network, maintaining ongoing vehicle access safely, whilst delivering the scheme ahead of schedule;
- Deliver a major highway improvement project to programme and under-budget, demonstrating effective financial control;
- Establish robust procedures for reporting to the CWLEP, who are also a key funder for Phase 2;
- Demonstrating that Warrington can continue to deliver economic growth through focused investment in the transport network.

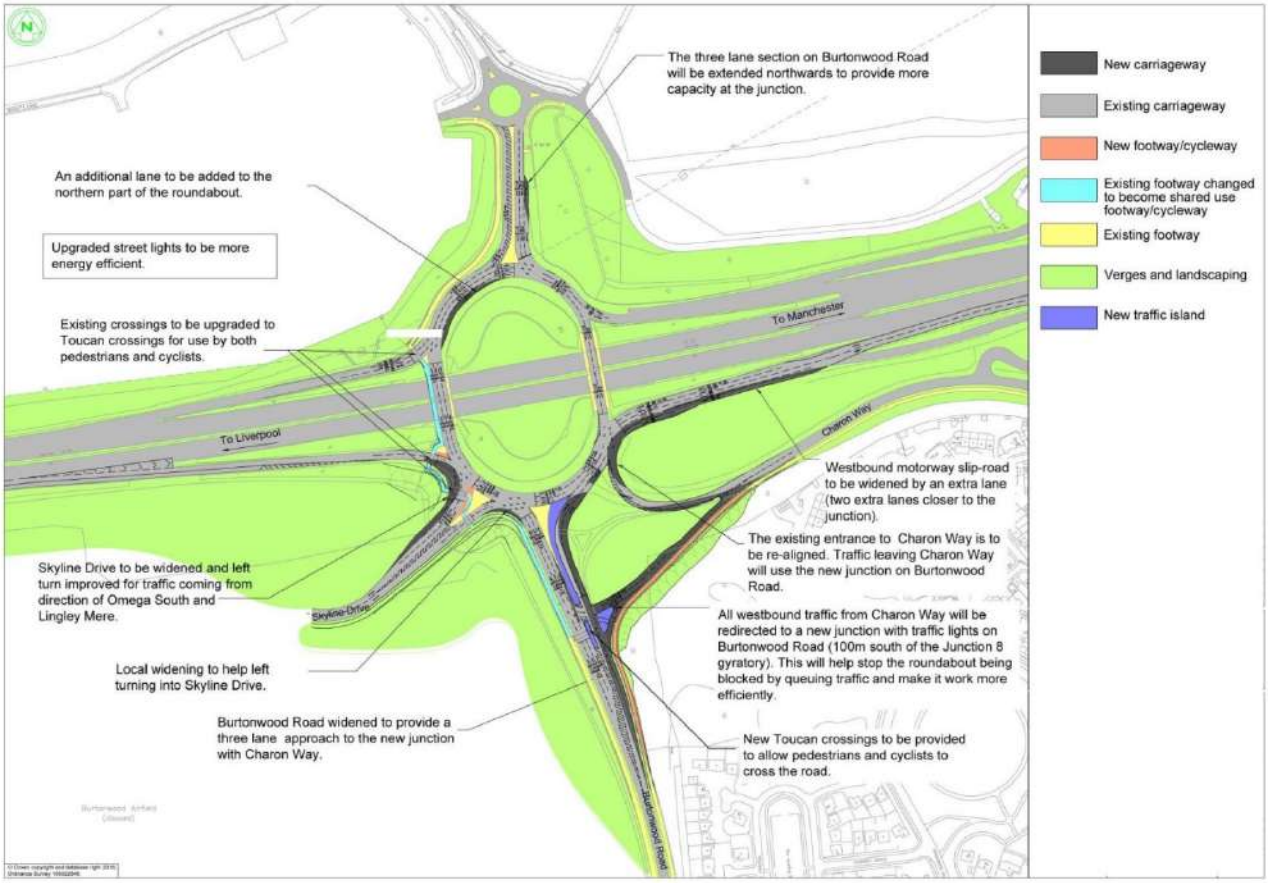
21.2.2 M62 Junction 8

In 2007, outline planning permission was granted for Omega Phases 1 and 2 which included a mix of office, logistics uses and improvements to junction 8, M62. However only a proportion of the development came forward and therefore the junction improvements weren't triggered at that time.

Since then, further applications for housing, a new school, shops and community uses have been permitted on the Omega site. In order to bring forward the junction improvements WBC have been working as part of the Cheshire and Warrington Local Enterprise Partnership (C&W LEP) to developing a funding package, including contributions from Omega Warrington Limited and other developers in the area, to deliver the scheme estimated to cost around £12 million.

Construction begun in 2017 and is still in process. Figure 56 details the scheme specifics, which are comparable in scope and cost to some of the interventions being undertaken as part of Warrington East Phase 2.

Figure 56: M62 Junction 8, scheme specifics



Source: Warrington Borough Council

The scheme will support Commercial development comprising office, logistics warehousing and manufacturing which could create around 9000 new jobs across the local business parks.

Relevance to Warrington East Phase 2:

Warrington East Phase 2 aims to reduce highway congestion and improve highway network capacity to encourage further investment and expansion of commercial development in a similar manner to the scheme currently under construction at Junction 8 of the M62.

Although not yet complete, at a similar cost, and being delivered through Balfour Beatty this scheme is directly comparable with Warrington East Phase 2; it is on track delivery in terms of time and budget further evidence WBC's ability to deliver schemes of a similar nature.

To date delivery of the M62 Junction 8 scheme shows that:

- WBC can deliver a major engineering project within a busy highway network, whilst maintaining ongoing vehicle access and safety
- Have established reporting procedures with the C&W LEP and private sector partners regarding progress and issues

21.3 Programme/project dependencies

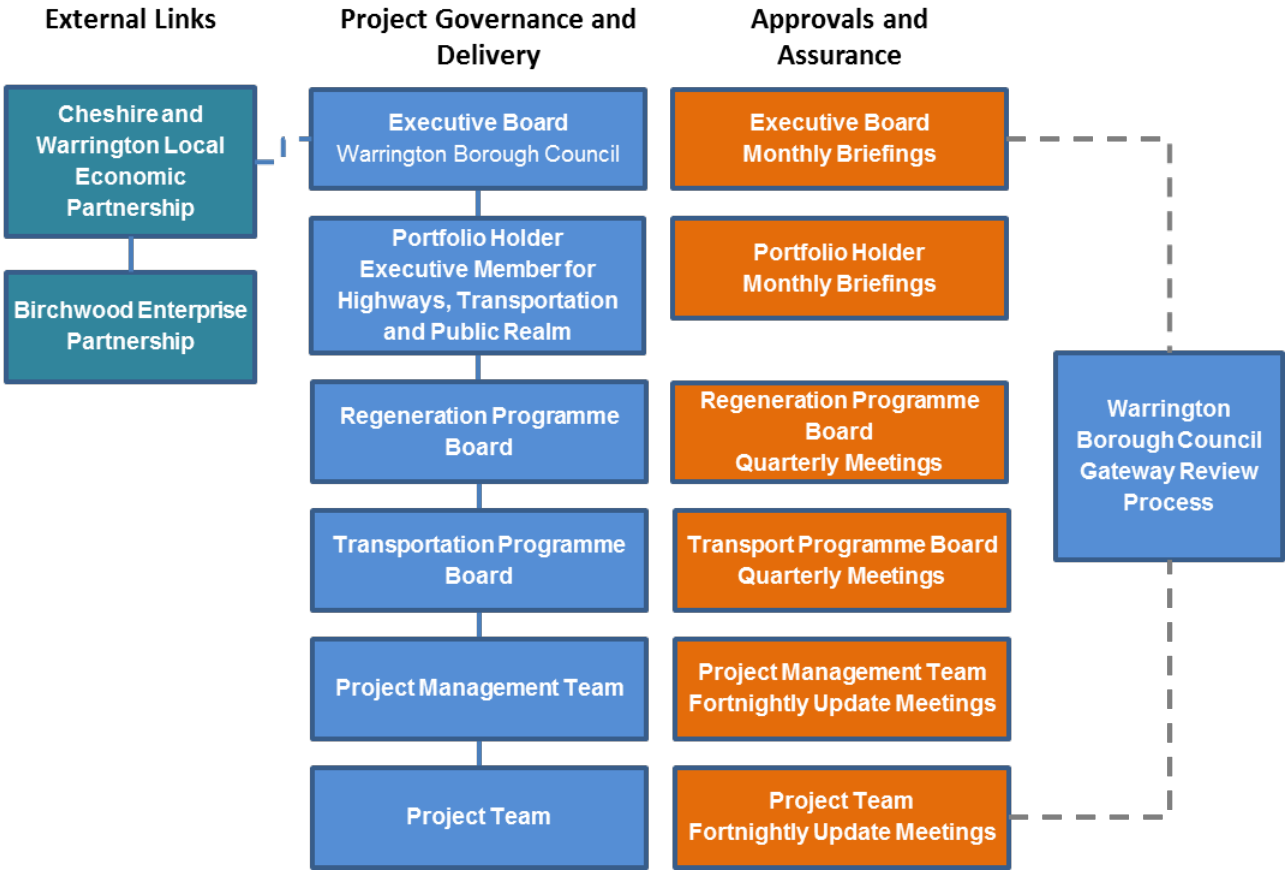
To realise the Warrington East Phase 2 programme, a set of project dependencies have been identified, these are outlined below:

- C&W LEP approval of Warrington East Phase 2 Scheme
- Confirmation of private sector contributions to the scheme as costs are still indicative
- Agreement of the construction contract
- Approval by Executive Board to allocate both budget and resources
- Appropriate utilisation of project resource

21.4 Governance

Warrington Borough Council are the scheme promoter and delivery agent for Warrington East Phase 2. The governance arrangements, structure and role of Warrington Borough Council for whole of the Warrington East Phase 2 is set out below.

Figure 57: Project governance structure



Source: Warrington Borough Council

A brief description of the roles and responsibilities of each of the above groups are noted below.

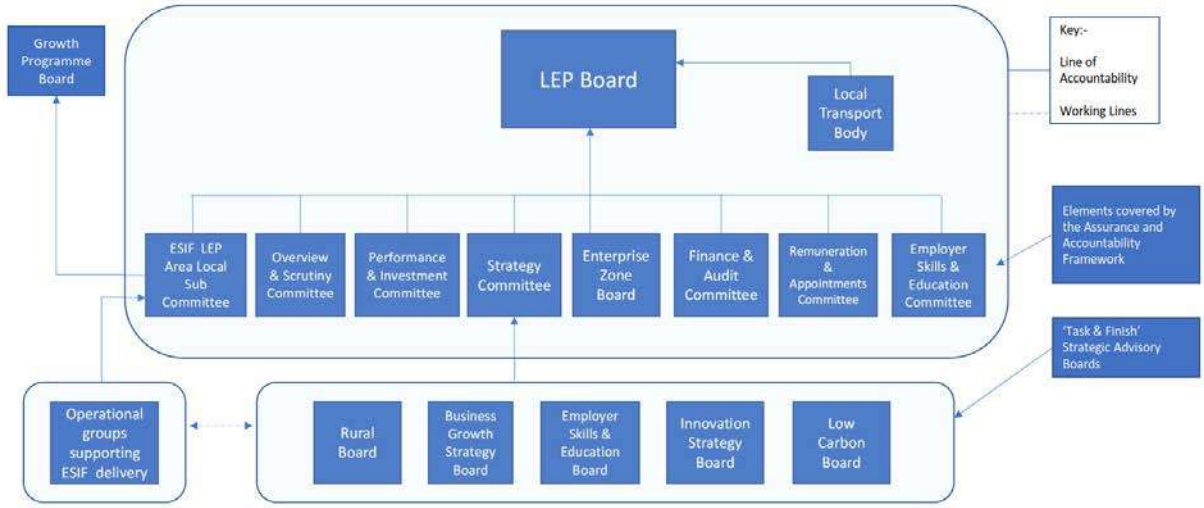
21.4.1 External links

21.4.1.1 Cheshire & Warrington LEP

Cheshire and Warrington Enterprise Partnership (C&W LEP) are one of 38 public-private partnership bodies across England. As the key funding source for the scheme the C&W LEP have an integral interest in ensuring in the Warrington East Phase 2 is delivered on time and to budget. This section sets out the governance structure of C&W LEP and the role of the Performance and Investment Committee who have delegated authority to grant funding for Warrington East Phase 2.

C&W LEP have a key role across Cheshire and Warrington; the organisation sets local economic priorities in order to help focus and boost economic growth and job creation. C&W LEP decide how funding devolved from central Government is spent within the area. The structure of C&W LEP is set out below in Figure 58:

Figure 58: C&W LEP governance structure



Source: C&W LEP

Governance

The C&W LEP Executive Board sets the corporate and strategic direction of the organisation and oversees five committees. Of specific note is the Performance and Investment Committee, which has the delegated authority to approve funding for projects put forward for Local Growth Funding, provided their value is within certain financial limits, which Warrington East Phase 2 is. They will also:

- Provide scrutiny and oversight to funded schemes
- Monitor programme performance
- Ensure that the processes set out in the LRP's Assurance and Accountability Framework are adhered to

Delivery

Warrington East Phase 2 will be delivered in line with the LEP Growth Programme Assurance and Accountability Framework. C&W LEP have devised the framework in order to establish a clear decision-making process within its Growth Programme (Local Growth Fund Programme, Growing places Fund and European Structural Investment Fund). This framework provides a mechanism for Warrington Borough Council, the LEP and key stakeholders to be clear about their responsibilities and to ensure good project governance.

Funding

C&W LEP hold the devolved funding from Central Government, however responsibility lies to Warrington Borough Council to make the relevant payments to the associated project partners to ensure scheme delivery. In accordance with the C&W LEP Assurance Framework, WBC are then required to apply to the Performance and Investment Committee for funding release in

arrears, providing evidence of paid invoices as well as documenting all expenditure associated with LEP funding.

21.4.1.2 Birchwood Enterprise Zone

Birchwood Enterprise Zone consists of 160 companies, with many specialising in science and engineering activities. The enterprise zone has a direct interested in the scheme with the A574 providing access to the science park. Birchwood Enterprise Zone are contributing to the funding of the scheme and will be updated accordingly to the progress of the highways scheme.

21.4.2 Project governance and delivery

21.4.2.1 Executive Board

The Executive Board is an elected board chaired by the WBC's Chief Executive Officer. The Board will review progress of the project and provide corporate and strategic direction for Warrington East Phase 2. Their key responsibilities are to:

- Provide any necessary approvals from one delivery stage to the next
- Approve the appointment and/or spending over £250,000
- Provide strategic direction, when required, to the Regeneration and Transport Programme Boards
- Review and challenge the delivery of the scheme in relation to time, cost and quality requirements
- Provide formal briefings to senior C&W LEP Board members

21.4.2.2 Portfolio Holder

The Portfolio Holder is the Elected Member Hans Mundry, Executive Member for Highways, Transportation and Public Realm. The Portfolio Holder sits in the Executive Board and will provide day to day oversight of the delivery of Warrington East Phase 2.

21.4.2.3 Regeneration Programme Board

The Regeneration Board receives updates on all the major capital regeneration schemes, including specific risks and decisions taken by officers, some of which have been undertaken under delegated authority from the Executive Board. The Regeneration Programme Board has the responsibility of reviewing, recommending and approving the Warrington East Phase 2 scheme to enable work packages to commence and proceed through the WBC three-stage gateway process, (covered in section 21.5), being cognisant of available funding and resources.

The Regeneration Programme Board is chaired by the Executive Director for Environment and Regeneration and includes approval authority up to £250,000. The Board is responsible for establishing robust performance monitoring and reporting mechanisms for all major projects.

21.4.2.4 Transport Programme Board

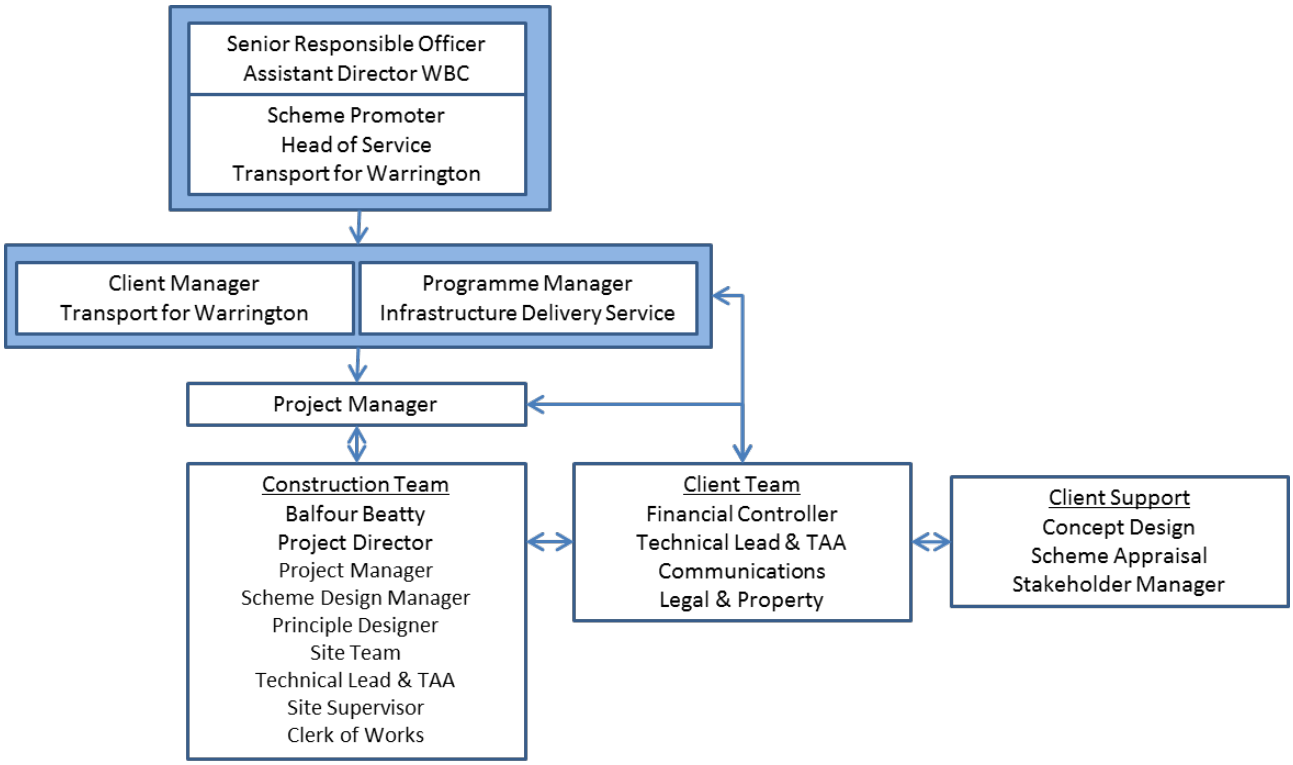
The Transport Programme Board is chaired by the Assistant Director for Transport and Operations who is also the Warrington East Senior Responsible Officer. The Scheme Promoter, and the Programme Managers will also be in attendance. The Transport Programme Boards role is to review Monthly Status Reports on progress, cost variations, issues and risks, and the overall program for all capital transport projects to ensure the project is delivered to budget, time and quality.

21.4.2.5 Project Management Team & Project Team

Accountable to the Transport Programme Board and ultimately the Executive Board, the Project Management Team will oversee and scrutinise the delivery of Warrington East Phase 2. The Project Management Team will be responsible for the day to day delivery of the scheme an ensure financial control.

The structure of the Project Management Team and Project Team is displayed in the schematic below with their respective roles detailed in Table 52.

Figure 59: Project Management Team and Project Team structure



Source: Warrington Borough Council

Table 52: Project Management Team roles and responsibilities

Role	Responsibilities
Senior Responsible Officer	• Overall accountability to ensure Warrington East Phase 2 meets its objective and delivers the projected benefits • Key decision maker • Reports to the Transport Programme Board
Scheme Promotor	• Progresses the scheme on a day to day basis • Ensures strategic objectives for the Project and Programme Managers are well defined • Key contact for the scheme at a senior operational level
Client Project Manager – Transport for Warrington	• Planning, designing, and monitoring scheme progress • Financial control of non- construction related activities • Management of interfaces between scheme components • Manage the procurement of the scheme • Preparation of monthly update reports in accordance with WBC's project and

Role	Responsibilities
	programme management processes.
Programme Manager - Infrastructure Delivery Service	• Overseeing delivery of design and construction works • Management of risks and issues on a daily basis • Financial control of construction related activities • Preparation of monthly update reports in accordance with WBC's project and programme management processes. • Provide cost loaded schedules with associated gateway reviews.
Client Team:	
Technical Infrastructure Lead Communications Legal and Property Project Finance	• Provision of technical advice related, nut not limited to engineering, building, communications and operational staff requirement for WBC, in liaison with the Construction Team • Ensures the scheme is effectively communicated to key stakeholders in accordance with the agreed Stakeholder and Communication Plan • Legal Advice relating to funding and delivery agreements and advice relating to land ownership issues • Provision of advice on monthly spend/budget, monthly financial reporting to the Transport Programme Board, and reporting requirements associated with C&W LEP funding
Client Support:	
Highways England Preliminary Design	• Provision of provide independent advice to the Client Team relating to construction and land • Continued development of detailed designs through to construction standards designs • Accountable to the Programme Manager -Infrastructure Delivery Service
Scheme Appraisal & Business Case	• Development of the full Major Scheme Business Case and associated supporting documentation • Accountable to the Client Project Manager – Transport for Warrington
Scrutiny of Business Case and Modelling	• Review and appraisal of the full business case submission
Stakeholder Manager	• Responsible for ongoing stakeholder and public engagement throughout the lifetime of scheme development and delivery
Construction Team	• The construction team comprises the lead contractor Balfour Beatty, including the Balfour Beatty Project Director and Technical Lead • The construction team will be responsible for the delivery of the project onsite.

Source: Warrington Borough Council

21.5 Project assurance and approvals

This section sets out the project plan, key assurances and approval milestones part of the Warrington East Phase 2 project. The project assurance responsibilities have been set by the Executive Board, these are outlined below.

21.5.1 LEP Growth Programme Assurance and Accountability Framework

Cheshire & Warrington LEP's partial funding of Warrington East Phase 2 warrants the use of the LEP Growth Programme Assurance and Accountability Framework. The framework includes the appointment of an independent technical advisor to review the Business Case and Value for Money appraisal on behalf of the LEP. For Warrington East Phase 2, Cheshire & Warrington LEP have appointed a reviewee from WSP Parsons Brinckerhoff. In meeting the framework requirements, the Cheshire & Warrington LEP Performance and Investment Committee will, as noted in section 21.4.1.1 also be responsible for approving funding for Warrington East Phase 2.

21.5.2 Formal assurance and review points

An internal Warrington Borough Council plan has been put in place to ensure the project is objectively reviewed at key decision points. This ensures that Warrington East Phase 2 remains on track and progresses to the next stage of project development. A number of key review points have been set and will be undertaken by a review team comprising of Warrington Borough Council officers independent of the Warrington East Phase 2 Scheme.

- Confirm the full business case requirements once the OBC has been approved
- Review scheme design
- Confirm objectives, outputs and desired outcomes of the scheme
- Ensure the proposed plan for delivery and management is robust;

- Review procurement process and the contract in place
- Reaffirm justification for the investment
- Review project risk and contingencies
- Ensure change control is in place

- Review benefits realisation plan and confirm the benefits are clearly set out
- Assess the contract and contract management procedures
- Ensure future monitoring and evaluation is in place as benefits are not likely to be realised immediately after scheme completion
- Identify any key lessons learnt

21.5.3 Statutory powers/consents

The Traffic Management act is the main statutory duty under which Warrington Borough Council will operate. Any requirements for planning permissions, land acquisition, environmental consents and traffic regulations will be obtained prior to commencement of the scheme. These statutory undertakings will pass through the Executive Board and Transport Programme Board approval process before being initiated; this approval responsibility has been incorporated into the governance arrangements for Warrington East Phase 2 to provide assurance that major actions with a material impact for WBC have sufficient levels of review and control.

21.5.4 Financial management

The Executive Board will endorse the engagement of Balfour Beatty for the construction contract through the SCAPE Framework. Any additional contracts greater than £250,000 will also require approval from the Executive Board. Financial approvals and the relevant authorising parties are shown in Table 53.

Table 53: Financial delegation amongst key members of the project governance structure

Role	Financial delegation and responsibility
C&W LEP Performance and Investment Committee	Approval authority for the release of C&W LEP funding to WBC to facilitate the delivery of the scheme. Performance and Investment Committee is to act with delegated authority on behalf of the C&W LEP Board for this scheme
WBC Executive Board	Authority for all financial decision greater than £250,000
Major Projects Finance Board	Responsible for authority and scrutiny of WBC's capital borrowing element of the scheme funding.
Senior Responsible Officer	Responsible for overall success of Warrington East Phase 2 including contacting
Programme Manager (Infrastructure Delivery Services and Client Project Manager (Transport for Warrington)	Responsible for the commissioning of day to day work and approval of invoices.

In accordance with the WBC Corporate Procurement Guide, a contracts register will be used to document all contracts that are more than £20,000 and under £50,000. For contracts in access of £50,000, these will be presented to the Central Commissioning and Procurement Team to update the Central Contracts Register.

In order to the manage any escalating works or commissions costs, the Senior Responsible Officer and Programme Manager will contact the project board as soon any financial variations come to light or are likely to. This includes advising the amount of the variation and potential options to realign deliverables with the budget where practicable.

21.5.5 Gateway process

To monitor the delivery of Warrington East Phase 2 the scheme will be managed through WBC's Gateway Process. The Gateway Process is a systematic review process that is undertaken at critical points for projects which the council deem to be important or high-risk. The system brings about the following advantages:

- Compliance with best practice
- Setting of relevant and realistic targets
- Deployment of skills to a project
- Stakeholder involvement
- Project feedback
- A robust audit trail

The SCAPE framework has been used to mould the gateway stages for Warrington East Phase 2. Which are illustrated on the next page The Client Project Manager and Programme Manager - Infrastructure Delivery Service will monitor the following stages of the programme and report to the Scheme Promotor and Senior Responsible Officer where appropriate:

Figure 60: WBC's three gateway stages

21.5.6 Approvals plan

The progression of Warrington East Phase 2 is subject to the following approvals schedule:

Table 54: Approvals plan

Milestone	Estimated date
Submission of interim MSBC to WSP Ltd for review and assurance	21st February 2018
Submission of Business Case to C&W LEP for conditional approval	14th March 2018
C&W LEP Performance and Investment Committee conditional approval	21st March 2018
WBC Executive Board meeting for final approvals	9th April 2018
Public exhibition explaining scheme and construction process	Early May 2018
Construction commences	End May 2018

Source: Warrington Borough Council

The conditional approval submission in March 2018 will provide approval for WBC to draw down on LEP funding, conditional in that monies would need to be paid back if Warrington East Phase 2 was ultimately not delivered. The full approval submission will be made once powers and consents have been obtained and scheme costs have been finalised.

21.6 Project delivery plan

The project and actions required for delivery are well understood. They have been assessed in consultation with the full project team and have the support of key stakeholders. Figure 61 below illustrates the RIBA work stages covered to date and those that will be covered and are described in this interim MSBC Management Case, namely RIBA stages 3-5.

Figure 61: RIBA work stages and Warrington East Phase 2 Delivery

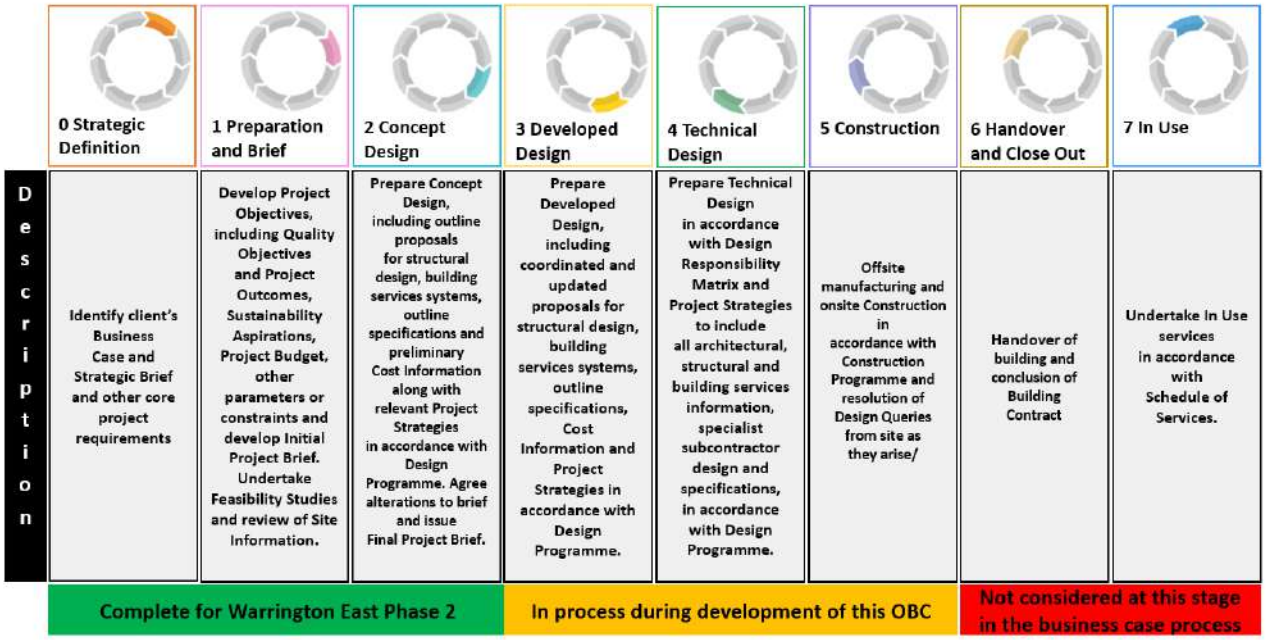


Table 55 provides the key milestones and associated delivery dates for Warrington east Phase 2.

Table 55: Delivery programme – key milestones

Key project milestone	Date
RIBA Stage 3	
Completion of Outline Business Case with indicative costs	March 2018
Provision of final costs	March 2018
Quantified Risk Assessment (QRA)	March 2018
C&W LEP Performance and Investment Committee conditional approval	March 2018
Finalise Outline Business Case with updated costs	April 2018
RIBA Stages 4 & 5	
Construction design – Main works	January 2018
Construction Contract Award	April 2018
Construction – Main Works (mobilisation)	April 2018
Construction Phase Main works	May 2018
Scheme Completion	March 2021 (at the latest)

The construction programme for the Warrington East Phase 2 scheme has been produced with the advice of Balfour Beatty who has been providing the council with early contractor involvement.

WBC intends to adopt the Prince 2 approach to project management to deliver the scheme through RIBA stages 3-5.

21.7 Implementation of workstreams

This section sets out the key workstreams for executing the Warrington East Phase 2 scheme. The key issues that may affect the delivery and implementation of Warrington East Phase 2 are also stated.

The Client Project Manager and the Programme Manager for Infrastructure Delivery Services are responsible for ensuring the day to day delivery of tasks and workstreams, as well as reporting to the Scheme Promotor, Senior Responsible Officer and the Transport Programme Board to bring to light any issues with the project programme. The key workstreams are noted below:

21.7.1 Design

Mott MacDonald are principally responsible for the design of the Warrington East Phase 2 and are contractor to deliver the project to Pre-Construction stage. Responsibilities include design of the various options through Stage 0 to Stage 2 of the options appraisal. Balfour Beatty are also contracted to provide costings for the design of Warrington East Phase 2 as well as risk quantification through Stage 1 and 2 of options appraisal. The target cost prices are then passed to the Senior Responsible Officer, who subsequently advises the Programme Board to progress the scheme to the construction phase.

21.7.2 Land acquisition

Any negotiation over the acquisition of land will be conducted by Officers from Warrington Borough Council Property and Legal Departments. Officers from the schemes External Partner – Warrington and Co – will also assist with negotiation process. Ultimately, the responsibility rests with the Project Manager to advise the Programme board when land acquisition may be required.

21.7.3 Construction

Balfour Beatty have been commissioned through the SCAPE Framework to carry out the construction of Warrington East Phase 2. A nominated Construction Manager and Clerk of Works from the infrastructure Delivery Service group will oversee the project from the client side.

21.7.4 Consultation

Warrington Borough Council, in partnership with the consultancy firm Resolve, will conduct public consultation and stakeholder engagement. To ensure effective communication of the project to multiple stakeholders, both the Project Manager and an Officer in the Council's Communication Department will be responsible for managing and overseeing the consultation process. Additional consultants and contractors will be deployed if more localised consultation is required with key stakeholders.

21.7.5 Business Case development

Mott MacDonald are responsible for the Business Case Development of the Warrington East Phase 2 Scheme. The Business Case team have extensive knowledge and experience of working in Warrington Borough, this includes development of the Warrington East Phase 2 SOBC and the Birchwood Pinch Points scheme. Mott MacDonald have had a rich experience in the development of the Warrington East Phase 2 project and are thereby in a strong position to deliver the Outline Business Case for Warrington East Phase 2. They are responsible for the production of the Options Appraisal Report and delivery of the Outline Business Case.

21.8 Key issues for implementation

Table 53 defines the key issues that can potentially impact delivery and the associated mitigation measures to minimise the impacts of the issues.

Table 56: Key implementation issues

Issue	Impact	Mitigation
Work Package Management and Co-ordination	The division of tasks into distinct packages has potential to create disconnect between the outputs being produced. This could delay the programme whilst issues are rectified or reduce the overall quality of delivery	The Project Management team will be responsible for co-ordinating work package activities to ensure key interdependencies are managed and the overall programme is maintained. This will be reviewed and discussed at project team meetings.
Resource Management	The project is likely to experience peaks in work load and other periods of relative quiet for some teams. The right resource needs to be available consistently throughout the project to ensure quality and delivery to programme.	Resource will be planned in advance by each organisation based on the delivery methodology and scope defined in the project plan. This will be monitored and evaluated each month to reforecast demand as necessary.
Information Management.	The vast amount of information that is produced needs to be accessible to the right people at the right time. Failure of this could delay the programme or negatively impact third party communication.	The project Information management plan will set out the procedures to be adopted for production, storage and issue of information both within the project team and externally.
Configuration Management.	Failure to ensure a consistent basis of design between disciplines or failure to maintain appropriate version control could result in wasted work or poor-quality outputs.	The information management plan will set out a consistent version control procedure for all teams. A common data environment will be used to progress designs.
Health and Safety	The Health and Safety of project team members and third parties during design and construction will need to be paramount to prevent injury or harm.	The design team will conduct hazard review meeting during the design process to identify and mitigate potential risks. Hazard reduction will continue on site with the contractor conducting regular H&S reviews. All works will need to be undertaken with an appropriate risk assessment and method statement. Key individuals will be subject to specific risk meetings.
Strategy and Objectives	The scheme has been developed to meet specific objectives, defines based on the need for intervention. Should these change, the nature of the scheme would need to be reviewed and the intended outputs altered.	Ensure that scheme objectives are based on sound evidence and continue to review their relevance throughout the project.

Source: Mott MacDonald/WBC

21.9 Risk management

The management of risk and uncertainty is key to the successful delivery of the scheme, and an appropriate strategy will identify threats to project delivery and enable effective risk management actions to be assigned.

21.9.1 Risk management strategy

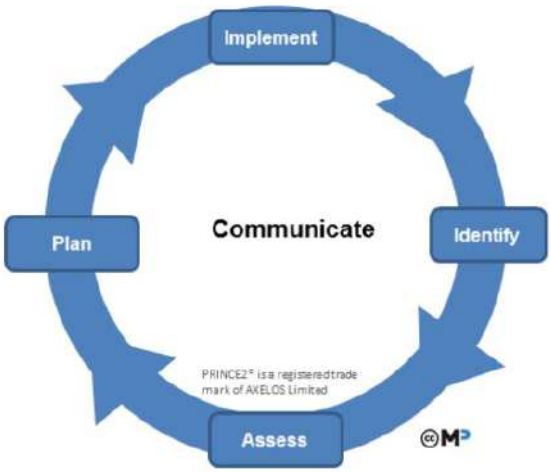
An effective risk management strategy for the project will be based on the principles for risk management contained within the OGC PRINCE2 guidance. The procedure for identifying key risks should follow as below:

- Identify: complete the risk register (as appropriate to the area of the project and/or the producing organisation) and identify risks, opportunities, and threats;

- Assess: assess the risks in terms of their probability and impact on the project objectives
- Plan: prepare the specific response to the threats (e.g., to help reduce or avoid the threat), or this could also be to plan to maximize the opportunity if the risk happens
- Implement: carry out the above in response to an identified threat or if one occurs
- Communicate: report and communicate the above to relevant project team members and stakeholders

Risk management needs to be an ongoing process, shown in Figure 62 below.

Figure 62: Risk management process



21.9.2 Current risk management

Balfour Beatty have successfully demonstrated their ability of managing risks delivering over £165m of highways projects in the North West in last three years, all within budget. As such, WBC are confident Balfour Beatty understand fully the potential risks and opportunities presented by this scheme, and how to mitigate them effectively.

Balfour Beatty's risk management process has been developed through the delivery of over £300m of schemes in the North West region in the last three years proving its value and effectiveness when avoiding project delays or cost increases. This process is shown in Figures 63 and 64.

Through this process Balfour Beatty have produced a risk register as part of their Quantified Riak Assessment process and this identifies 41 risks, which they have categorised as either:

- Programme
- Design
- Cost
- Health, safety & environment

These risks focus on actual physical delivery of the scheme and are collectively classified in this report as **Scheme delivery risks**: those affecting the cost, scope and timescale for the project.

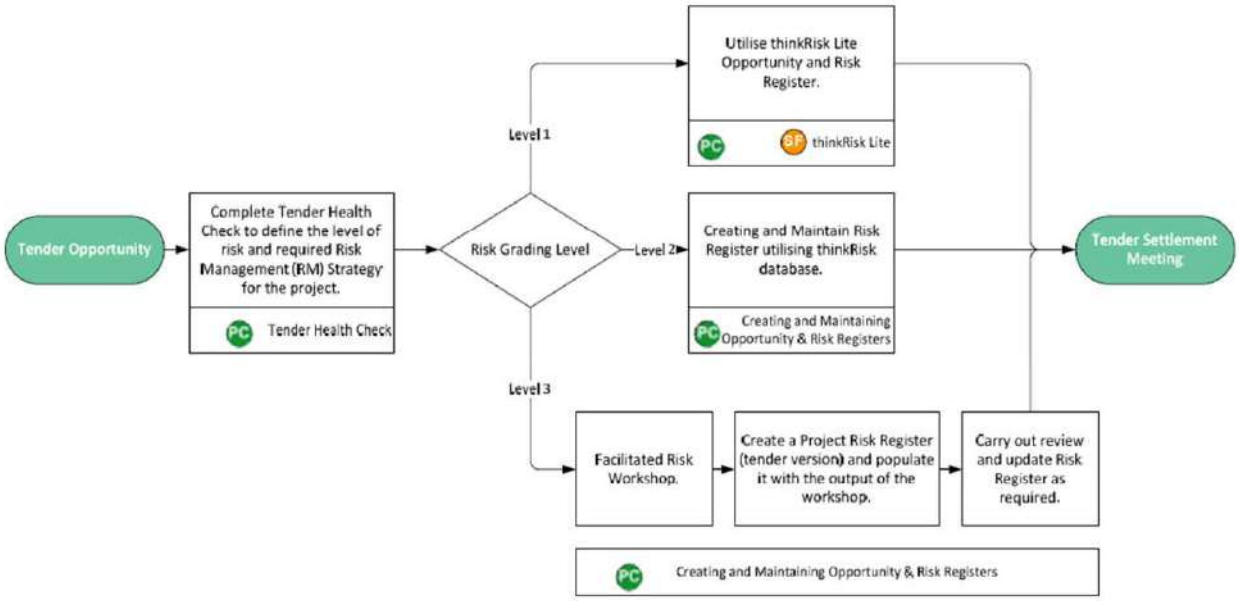
WBC and Mott MacDonald have, in addition, collectively identified wider risks to the project and WBC, these are classified in this report as **Programme management risks**

These are both discussed below.

21.9.2.1 Scheme delivery risks

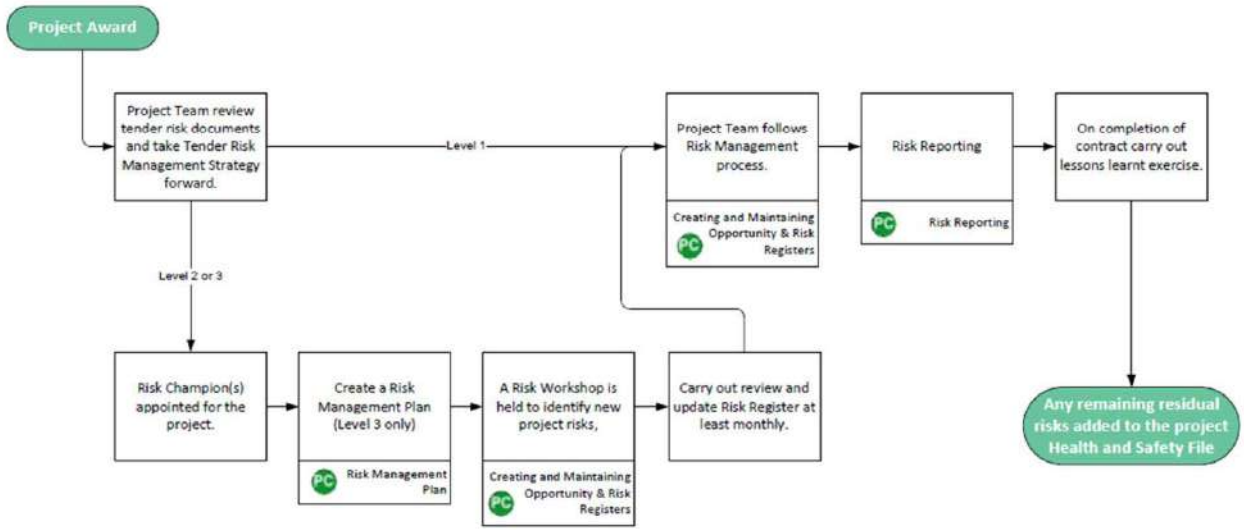
Scheme delivery risks have been assessed as part of the Quantified Risk Assessment (QRA) process adopted for Warrington East Phase 2. The full QRA detailing the scheme delivery risks, produced by Balfour Beatty can be found in Appendix X.

Figure 63: Risk management process – Construction UK Part 1



Source: Balfour Beatty

Figure 64: Risk management process – Construction UK Part 2



Source: Balfour Beatty

The top five scheme delivery risks (identified in the QRA process based on the probability of occurrence and the severity of impact should they occur, are noted in the Table below.

Table 57: Top five scheme delivery risks

Risk category	Risk event	Consequence	Mitigation
Design	Scope Creep - Works increase or change during detail design	Increase construction cost and programme 20% of Construction Cost	Periodic review
Cost	Contaminated land	Additional cost, 9799 cu.m excavation, and 25% at additional £100 per cu.m	Further site investigation
Design	Design Creep – Design work increases or change during construction level design	Increase construction cost and programme 1% of Construction Cost	Periodic review
Cost	Quantities increase	Additional cost	Check on BOQ carried out during pre-construction
Programme	Works delayed due to adverse weather	Construction delayed and costs increased	Minimise areas of excavation left uncovered. Monitor daily weather forecasts for specific area

Source: Balfour Beatty

21.9.2.2 Project management and delivery risks

In addition to the construction related risks noted above WBC and Mott MacDonald have identified key project management and delivery risks that look at wider issues; they have been grouped into the following categories:

- Strategic risk
- Political risk
- Management risk
- Funding risk

These are shown below.

Table 58: Programme management risks

Risk category	Risk event	Consequence	Mitigation
Funding	The schemes result in a low BCR value.	Funding is not granted by the C&W LEP	Complete early BCR analysis to a high level to gauge schemes. Design team to liaise with Business Case and Transport Modelling streams to consider factors which may boost the BCR.
Funding	Private sector and Enterprise Zone contributions are not forthcoming	Shortfall may not be able to be covered by WBC, and scheme may not go ahead/ be scaled back	WBC to maintain clear communication with all funding partners throughout the project lifecycle
Strategic	Delay to the approval of the business case by the C&W LEP and Executive Board	Scheme is delayed and all components may not be delivered within timeframe, or costs may escalate due to increased resource requirements to maintain delivery	Ensure business case and supporting documents are completed with required information ahead of submission deadlines
Strategic	Opposition to the scheme from key stakeholders or the	Adversely impacts WBC's reputation	WBC and Balfour Beatty to engage with key stakeholders and the public throughout the lifecycle of the project

Risk category	Risk event	Consequence	Mitigation
	general public		Appoint a Public Liaison Officer to address any construction or programme concerns.
Management	Key staff involved in the project leave WBC	Quality management of the scheme is adversely affected and there may be possible delays to delivery or budget overruns	Ensure the Project Management Team and the Project Team have sufficient resources and that a wider selection of staff outside the core team are updated and brief on the project as
Political	Change of local political administration.	Results in scheme becoming lower priority for other elected members resulting in it not going ahead.	Scheme developed in full consultation with the C&W LEP and their appointed independent
Political	Changes of national / local policy direction not involving legislation.	Scheme components become redundant and / or additional measures are required to support local and national ambitions.	Funding for the scheme has been devolved from central government to the C&W LEP for locally based decision making as to whether the scheme should progress, so changes in national policy will have a lesser impact than changes in Local policy. Local policy is well established through the Cheshire West and Chester Local Plan parts One and Two and the LTP3 which have been developed within the last two years.

Source: Mott MacDonald and Warrington Borough Council

21.9.3 Risk reviewing

Risk information is required to be up-to-date at all times to facilitate reporting. Active risks and actions are updated to support monthly reporting requirements. Updates will be undertaken by a joint risk and opportunity forum including the appointed Principal Designer, project manager and appropriate members of the Construction Team, Client Team and Client Support Team.

In addition to monthly reporting tasks, risk reviews will be undertaken ahead of any major gateways or following any significant changes.

21.9.4 Risk ownership

The overall risk management strategy will be owned by the SRO, however, the day-to-day management of the programme management risks (see section 21.9.2 below) will be managed by the Client Project Manager and the scheme delivery risks will be managed by the Programme Manager of the Infrastructure Delivery Services and Balfour Beatty as the delivery partner.

The process for escalation of risks is outlined below to demonstrate accountability levels within WBC. Where an individual or team does not have appropriate accountability, the risk would need to be escalated and managed at a higher level. If risks emerging during the delivery of RIBA stages 3-5 cannot be resolved within the Construction or Client team or if the risk has wider impacts beyond Warrington East Phase 2. The escalation scale is as follows:

- Client Project Manager and/or Programme Manager for Infrastructure Delivery Services
- Scheme Promotor
- Senior Responsible Officer
- Transport Programme Board
- Executive Board

21.10 Contract management

The construction contract with Balfour Beatty is a NEC3 through the SCAPE National Civil Engineering and Infrastructure Framework 2015. The NEC suite of contracts are well understood and are a tried and tested set of contracts used on large scale construction schemes.

It is anticipated that the contract will be managed by the Transport and Operations Section of Warrington Borough Council. There will be an internal project management team, including a project manager, a project engineer and a project planner. Delegated powers under the NEC contract will be passed onto the Senior Responsible Officer (SRO) and project management team to manage the day to day activities of the construction team. The SRO for the scheme is Dave Boyer.

Additional detail on contract management is noted in section 20.10 of the Commercial Case.

21.11 Communication and stakeholder management

Public and stakeholder consultation is essential to ensure that the various aspirations of the general public and key stakeholders are taken into account throughout development and delivery of the project and to manage the communication and flow of information relating to the scheme.

This section outlines the key stakeholders who are involved in Warrington East Phase 2, and has been extracted from a more detailed Stakeholder Engagement Plan that has been prepared by Warrington Borough Council and is included as Appendix B to this interim MSBC.

21.11.1 Consultation objectives

To inform the communication and stakeholder management approach, the following key objectives have been defined:

- Ensure that consistent, agreed key messages are a feature of all communication about the scheme and associated works
- Ensure that identified ward councillors, local parish councils and the portfolio holder receive timely and accurate information about the scheme
- Ensure local (and regional) media receive timely and accurate information about the scheme
- Raise awareness among all local businesses of the works, timescales and likely impact
- Ensure identified householders are informed about the works, timescales and likely impact
- Raise awareness among commuters of the works, timescales and likely impact
- Support all the above with engaging online content and picture-led news releases

21.11.2 Key stakeholders

In regard to audience insights key stakeholders were identified as:

- Warrington Borough Council Executive Board
- Ward Councillors
- Parish Councils
- Bus operators
- Highways England
- Local businesses

- Commuters working in Birchwood and Woolston
- Residents of Birchwood and Woolston
- Visitors to Birchwood Shopping Centre, Woolston neighbourhood hub, Birchwood tennis centre, local libraries and other key destinations
- Parents of children attending nearly Birchwood and Woolston schools

21.11.3 Stakeholder engagement programme

Having identified the key stakeholders WBC developed a stakeholder engagement programme that set out key consultation activities both with stakeholders and the general public. The table below outlines the programme which ran from the end of April to the end of June in 2017.

Table 59: Warrington East Phase 2 engagement programme

Milestone	Activities	Date
Information distribution and project promotion	2,000 promotional leaflets delivered to local homes in Birchwood and Woolston adjacent to the proposals	End April to Mid May
	Dedicated web page launch with plans of the proposals, details of the consultation process and an online feedback form	1st May onwards
	Email alerts to local councillors and key stakeholders	Fortnightly from end April to end June
	Press release issued throughout the consultation period	1st May to 30th June
	Member briefings	1st May to 30th June
	Meetings with stakeholders	1st May to 30th June
	Use of Council's Twitter and Facebook pages to promote the consultation events	1st May to 30th June
Public consultation events	8 drop in exhibition events at three accessible venues in Birchwood and Woolston	9th May to 10th June
	Web page updated with information on the events and the online feedback forms	1st May to 30th June
Feedback deadline	Submitted online or using a paper copy of the form with a freepost envelope	30th June 2017

Source: Warrington Borough Council

21.11.4 Consultation feedback approach and results

Feedback on the project proposals was obtained through several mechanisms:

The deadline for feedback was June 30th 2017 and in summary, feedback consisted of the following:

- 641 attendees at the exhibition drop in events
- 105 feedback forms
- 16 emails with comments

Table 60 shows the summarised results of feedback on the three main junction components of Warrington East Phase 2; this has been obtained through both written and verbal feedback mechanisms.

Table 60: Support for the scheme

Key questions	Yes (%)	No (%)	Total responses
Do you support the proposed changes to the College Place roundabout?	65 (72)	25 (28)	90
Do you support the proposed improvements to the southern end of the Oakwood Gate roundabout?	71 (86)	12 (14)	83
Do you support the proposed extension of the merge lane on Birchwood Way at the Moss Gate junction?	66 (76)	21 (24)	87

Source: Warrington Borough Council

The accompanying Stage 1 Stakeholder Engagement Report prepared by WBC details the reasons given for supporting and not supporting each of the scheme elements noted in Table 57 above.

No further formal consultation is planned but the Stakeholder Manager will ensure that there is ongoing Stakeholder engagement during project delivery.

21.12 Project reporting

This section provides an overview of project reporting on both scheme delivery and progress, and on accountability reporting to the C&W LEP.

21.12.1 Scheme delivery and progress reporting

The Client Project Manager and Programme Manager for infrastructure delivery services are responsible for the accurate, timely and appropriate communication of information on activities taking place within the Client Team, Client Support Team and Construction Team (see section 21.4 on governance). This includes ensuring that the Project Sponsor and SRO are up-to-date with relevant information from a Project Team level.

Progression of the scheme is formally reported to the Capital Projects Finance Board monthly and it notes issues related to:

- Programme
- Costs
- Funding

Reporting provides an update on scheme design and cost development, noting any changes since the previous reporting period. It also notes any updates or changes to the funding profile.

Project risks and key delivery milestones are also updates as part of this process.

The SRO is responsible for ensuring the Executive Board is provided appropriate information arising from these reports and that they are aware of relevant issues in order that they may provide necessary guidance on project decisions.

21.12.2 C&W LEP reporting

As the sub-regional funding body, the C&W LEP has a responsibility to ensure that the funding it is providing for the scheme is used appropriately. WBC currently engages with the C&W LEP through monthly ongoing progress meetings, where budget, spending, key risks, progress to programme and key issues are discussed. WBC also complete quarterly claim forms to draw down funding from the C&W LEP and these are also acconapied by an update report on expenditure and delivery.

21.13 Benefits realisation

This section outlines the approach to managing the realisation of benefits of Warrington East Phase 2. Benefits in this context are referred to as ‘a measure of the improvement that will be enjoyed by the organisation’. The benefits of any transport investment often play a crucial part in the justification for intervention. Therefore, identification of the benefits of Warrington East Phase 2 and how they will be measured is required.

A detailed benefits realisation plan has been produced and is included as Appendix C, to define how the benefits of Warrington East Phase 2 will be identified and measured. Included in the plan are the key beneficiaries of the scheme, outcomes, baseline measures, responsibility, and timeframes for each of the key strategic outcomes. The table below provides an overview of the key benefits.

Table 61: Benefits Realisation plan overview

Scheme objectives	Scheme Outcomes	Benefits experienced	Who Will Benefit	Benefit Ownership	Key outputs/deliverables required to realise the benefit
Improve network resilience to incidents, particularly those arising from the Strategic Road Network to ensure continued mobility reliability for our commercial occupiers	• Improvement in journey times along Birchwood Way • Improvement in journey times from Fearnhead to Birchwood Park. • Journey times along Local Network remain reliable when it is used as a diversionary route as a result of incidents on the Strategic Network	• Faster, more reliable commuter journeys to Birchwood will support broader travel horizons for those seeking employment or training • Faster, more reliable commuter journeys on the strategic road network makes long distance travel more reliable opening up additional job markets further afield • Increased attractiveness for future commercial and business development as the areas becomes more accessible • Increasing network resilience and prevention of highways degradation results in cost savings for the Borough	Residents, commuters, businesses, current commercial occupiers	Warrington Borough Council	• College Place Roundabout improvements • Capacity improvements along Birchwood Way and at Blackbrook Avenue Roundabout • Oakwood Gate/Birchwood way Roundabout improvements • Dualling of Birchwood Way north of the Moss Gate junction
Facilitate new development of, and increased occupancy of, existing employment land and stock in Birchwood and Woolston Grange to generate additional employment and training opportunities	• Improved access to employment at training opportunities in Birchwood and Woolston Grange	• Expanded choice of potential employment for residents as businesses expand and journey times become quicker and more reliable • Increased prosperity for Warrington residents and businesses	Residents, businesses, developers and investors	Warrington Borough Council	• Completion of Warrington East Phase 2 to improve access
Improve journey reliability times for both people and goods by reducing congestion at identified pinch points.	• Improvement in reliability of journey times along the corridor • Reduction in congestion and delays at key pinch points along the corridor	• Increased prosperity for Warrington as more reliable journey times for freight movement, support the growth of key employment sectors and specialist commercial activities • Enhanced living conditions for proximate residential areas as noise is reduced from idling traffic and local air quality is improved • Faster, more reliable journeys for commuter's visitors and residents travelling along the corridor increasing the attractiveness of the area as a place to live, work and invest	Residents, businesses, future investors	Warrington Borough Council	• College place roundabout improvements • Capacity improvements along Birchwood Way and at Blackbrook Avenue Roundabout • Oakwood Gate/Birchwood way Roundabout improvements • Dualling of Birchwood Way north of the Moss Gate
Facilitate the release of land for housing and commercial development through provision a safe, reliable and well-connected transport network	• Improved access to land available for housing and commercial development	• Increased attractiveness of the area for potential residents and commuters if housing and employment developments are easily accessible	Residents, future investors, developers	Warrington Borough Council	• Completion of Warrington East Phase 2 to improve access
Provide a safe, well connected	• Increase levels of cycling	• Healthier communities by encouraging of less	Residents,	Warrington	• Implementation of pedestrian

Scheme objectives	Scheme Outcomes	Benefits experienced	Who Will Benefit	Benefit Ownership	Key outputs/deliverables required to realise the benefit
network for cyclists and pedestrians to encourage & facilitate access to existing and future employment by a choice of modes	and walking in the area	sedentary lifestyles and reducing the burden on local health services • Contribution to meeting national air quality targets • More pleasant and safer pedestrian conditions for residents living along the corridor	pedestrians, cyclists and health services	Borough Council	crossings at Moss Gate (four-way signalised junction) • Implementation of shared cycle way at College Place Roundabout to connect to existing facility • Widening at Birchwood Way (5m verge) to allow for the future provision of a pedestrian cycle facility
Improve bus connectivity, journey times, and reliability to encourage access to existing and future employment by public transport	• Improve bus punctuality on key routes • Increase in bus patronage on routes serving the area	• Increased bus patronage as bus journey time reliability improves • Improved air quality along the corridor as people switch to bus • Contribution to meeting national air quality targets		Warrington Borough Council	• Installation of a new bus link between Faraday Street roundabout and Ordnance Avenue

Source: Mott MacDonald

21.14 Monitoring and evaluation

Monitoring and evaluation are essential parts of any infrastructure project. It provides an opportunity to improve performance by reviewing past and current activities, with the aim of replicating good practice in the future and eliminating mistakes in future work. This section outlines the highlights of the monitoring and evaluation plan for Warrington East Phase 2 which is included as an accompanying document in Appendix D.

The DfT guidance '*Monitoring and Evaluation Framework for Local Authority Major Schemes'* forms the basis of the monitoring strategy alongside the Cheshire and Warrington LEP Assurance Framework.

The DfT guidance outlines three tiers of monitoring and evaluation, of which additional detail is provided in the accompanying Monitoring and Evaluation Plan. Warrington East Phase 2 follows the standard monitoring practice as the scheme is less than £50m in value.

The various monitoring measures for standard monitoring are considered in terms of the key stages of the scheme, these are:

- Inputs (i.e. what is being invested in terms of resources, equipment, skills and activities undertaken to deliver the scheme).
- Outputs (i.e. what has been delivered and how it is being used, such as roads built, bus services delivered).
- Outcomes (i.e. intermediate effects, such as changes in traffic flows, modal shifts).
- Impacts (i.e. longer-term effects on wider social and economic outcomes, such as supporting economic growth).

21.14.1 Evaluation

In accordance with the above, monitoring and evaluation has been divided into two parts:

- Monitoring of project delivery, which focuses on scheme inputs and outputs
- Monitoring of the achievement of the scheme objectives, which focuses on impacts and outcomes

The monitoring and evaluation of the project's construction and delivery, focusing on inputs and outputs is set out in Table 62.

Table 62: Monitoring of project delivery (inputs and outputs)

Aspect of project delivery	Method of monitoring	Timeframe	Responsibility
Delivery of Warrington East Phase 2 to timeframe	• Programme/project plan assessment • Review of risk register and assessment of impacts • Project review during scheme design and build. • Site inspections	Ongoing throughout delivery and construction	Warrington Borough Council
Delivery of Warrington East Phase 2 to budget	• Programme/project plan assessment • Identification of any changes to assumptions. • Analysis of risk in the elements of costs. • Project review during scheme design and build. • Site inspections	Ongoing throughout delivery and construction	Warrington Borough Council
Delivery of Warrington East Phase 2 to specification	• Programme/project plan assessment • Review of risk register and assessment of impacts • Project review during scheme design and build. • Site inspections	Ongoing throughout delivery and construction	Warrington Borough Council

Source: Warrington Borough Council

Table 63 shows how the strategic and scheme objectives will be measured. A performance indicator is provided which acts as a proxy for the success of the scheme.

Table 63: How scheme outcomes will be monitored

Objective	Outcome	Performance indicator	Methodology	Timing	Responsibility
Improve network resilience to incidents, particularly those arising from the Strategic Highway Network to ensure continued mobility reliability for our commercial occupiers	• Improvement in journey times along Birchwood Way • Improvement in journey times from Fearnhead to Birchwood Park. • Journey times along Local Network is no faster than journey times on Strategic Network	• A percentage reduction in travel times when travelling along Birchwood Way • A percentage reduction in travel times when travelling between Fearnhead to Birchwood Park. • A percentage reduction in travel times from the M62 into Warrington East	• Traffic master data analysis	• Prior to/during delivery to assess baseline conditions • 1-year post completion	• Warrington Borough Council
Facilitate new development of, and increased occupancy of, existing employment land and stock in Birchwood and Woolston Grange to generate additional employment and training opportunities	• Improved access to employment at training opportunities in Birchwood and Woolston Grange	• Increase number of jobs • Increase in occupancy level (firms and units) in existing stock • GVA	• Business surveys & economic evaluation surveys • Ex-post economic impacts study on impact of scheme	• Prior to/during delivery to assess baseline conditions • 1-year post completion	• Warrington Borough Council
Improve journey reliability times for both people and goods by reducing congestion at identified pinch points	• Improvement in reliability of journey times along the corridor. • Reduction in congestion and delays at key pinch points along the corridor	• A reduction in variability of journey times when travelling along the corridor • A percentage reduction in highways travel times when travelling along the corridor. • Reduction in queues at key pinch points • Key pinch points along the corridor operating within or below operating capacity	• Traffic master data analysis • ATC counters • Analysis of junction capacity and queue lengths of A51 junctions	• Prior to/during delivery to assess baseline conditions • 1-year post completion	• Warrington Borough Council
Facilitate the release of land for housing and commercial development through provision a safe, reliable and well-connected transport network	• Improved access to land available for housing and commercial development	• Number of planning applications submitted for residential and employment sites. • Number of new housing and employment developments	• Land surveys • Market Analysis study	• Prior to/during delivery to assess baseline conditions • 1-year post completion	• Warrington Borough Council
Provide a safe, well connected network for cyclists and pedestrians to encourage & facilitate access to existing and future employment by a choice of modes	• Increase levels of cycling and walking in the area	• A percentage increase in the number of people walking and cycling in Warrington East	• Non-motorised user counts • Active travel surveys	• During delivery/post opening	• Warrington Borough Council
Improve bus connectivity, journey times, and reliability to encourage access to existing and future employment by public transport	• Improve bus punctuality on key routes • Increase in bus patronage on routes serving the area	• A percentage increase in passengers on key routes along the corridor • Reduction in bus travel times on services serving the area • A percentage decrease in bus timetable delays	• Bus patronage data analysis from operators/local authority • Traffic master data analysis • Bus passenger satisfaction surveys	• Prior to/during delivery to assess baseline conditions • 1-year post completion	• Warrington Borough Council

21.14.2 Scrutiny

A project assurance team has been included within the project structure to ensure that independent officers/consultants are available to provide scrutiny on project activities. They will provide expert advice and questioning on key decisions and undertake project auditing activities on behalf of the Project Board.

Through the WBC Frameworks for consultancy procurement, the council has access to organisations that provide project auditing service. WSP have been selected for this role. In addition, WBC contains an in-house organisation termed 'Audit Warrington' that provides assurance services. The assurance team will be responsible for ensuring monitoring and auditing occurs at key project management stages.

21.14.3 Reporting

Monitoring and evaluation will be reported in two stages:

- Scheme delivery – reporting on scheme build, scheme delivered and cost measures.
- One year after scheme delivery – primary aim to understand the impact of Warrington East Phase 2 on journey times and travel patterns.

21.15 Contingency plan

It is important to consider what might happen to the project should there be a threat to delivery. Given there are a range of risks in the project delivery and management risk registers, it is not possible to account for every scenario. However, on the basis that one or more risk events occur that can potentially affect the project deliverability set out in this Management Case, contingency measures are outlined below. These relate mostly to ensuring that the impacts of the project are as close to cost neutral on the Council balance sheet as possible.

In the event the project cannot be delivered due to funding or construction issues, before the beginning of RIBA stage 5 – construction stage, the council would need to accept that the money spent to date on the pre-construction and design works would be abortive and need to be halted. The council would have an obligation to conclude the design works up to the pre-construction point and notify the contractor that they would not be taking forward the construction contract.

In terms of progressing Warrington East Phase 2, WBC would continue to investigate low cost alternatives in an attempt to deliver on some of the objectives identified as part of the scheme development.