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Leicester North West Major Transport Project

Phase 2 (Stage 1)

Blackbird Road/Anstey Lane Junction
Ravensbridge Drive / A6 Junction
Ravensbridge Drive Shared Cycle Path

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1 Executive Summary

1.1 Scheme Selection

1.1.1 The LNWMTP is a £19 million scheme that combines highways improvements, enhanced walking and cycling infrastructure and complementary Smarter Choices initiatives to support regeneration and development in North West Leicester in line with the objectives set out in the Leicester Strategic Economic Plan (SEP) and Local Transport Plan 3 (LTP3).

1.1.2 In 2016 Leicester City Council and Leicestershire County Council delivered the first phase of improvements under the project to the A50 County Hall and New Parks Way roundabouts.

1.1.3 In order to determine which scheme should be taken forward for phase 2, the scheme promoters undertook an extensive sifting and prioritisation exercise to evaluate options within the wedge area. This resulted in the selection of a scheme of junction and highways improvements in the Waterside Area of Leicester (see Figure 1-1)

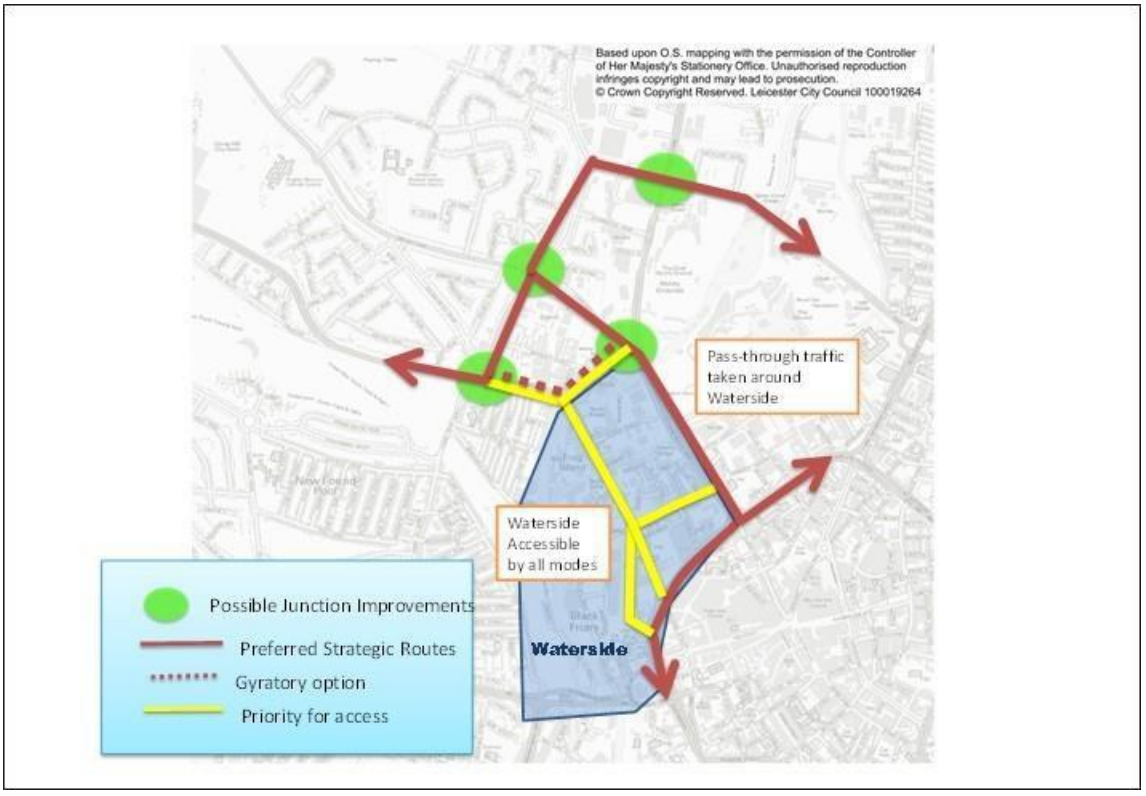


Figure 1-1: The Scheme selected for phase 2

1.1.4 The development of the scheme involved detailed modelling using the LLITM transport model. Initial studies[1] had shown that the scheme could produce strategic de-congestion benefits to the Waterside area. However, as the scheme developed, and more

[1] Technical Note of notes prepared for LNW Management Meeting 13/4/16. see Appendix D

comprehensive analysis was undertaken, the modelling[2] showed that the scheme was not producing sufficient overall benefits.

1.1.5 These results were not acceptable and provided the LNW Project Board with an opportunity to review the phase 2 scheme design and take into account changes in local and strategic factors that could impact the scope, design and delivery of the scheme.

1.1.6 This review showed that the operation of the improved five-ways junction was constrained due to the need to keep the scheme on land owned by the City Council. However, It is now expected that additional land will soon become available at the five-ways junction This additional land would allow improved designs to be developed.

1.1.7 At the junctions of Blackbird Road / Ravensbridge Drive and Ravensbridge Drive / A6 the review showed that the improvements were essentially capacity enhancements that would support increased traffic flow and deliver improvements in safety. The improvements would also directly support the City's strategic highways reclassification exercise (see Appendix C) which would downgrade the existing A50 between Woodgate and the Inner ring road and upgrade Blackbird Road and Ravensbridge Drive to be the A50. The B5327 would be extended from Anstey Lane to the A47 (Humberstone Road) via Blackbird Road, Abbey Park Road and Dysart Way. Improvements at these two junctions should therefore be capable of being delivered earlier than five-ways.

1.1.8 The LNWMTP Project Board reviewed the outcomes from the modelling and proposed two options for proceeding. The first option was to continue with the programme and submit a business case to the LTB that would not be able to demonstrate that the scheme met its design objectives. The second option was to split the development of phase 2 into two stages. The first stage would deliver the more straight-forward elements of phase 2 whilst additional work would be undertaken to develop a stage 2 scheme.

1.1.9 As a Consequence, it was proposed in December 2017 to restructure the programme into two stages:

1.1.10 The first stage would take the improvements developed for the Ravensbridge drive/Blackbird Road junction and the Ravensbridge Drive /A6 junction and deliver them as a first stage that would, in conjunction with Network management signal control, deliver scheme agnostic increases in network capacity whilst increasing junction reliability and safety. This would meet some of the LNW phase 2 objectives and would deliver improved infrastructure that would support a future stage 2 scheme.

1.1.11 The stage 2 scheme would involve looking at the feasibility of obtaining additional Highways land at five-ways in order to deliver and design a more robust scheme at this junction.

[2] Leicester North West Phase 2 MSBC, Systra 19 July 2017 LLITM modelling report. see Appendix D

1.1.12 This business case relates to the Phase 2 (stage 1) scheme

1.2 Scheme Objectives

1.2.1 The objectives reflect the delivery of the phase 2 (stage 1) scheme that is designed to support the improvements on Anstey Lane and the desire to alter the road classifications and act as an enabler for a stage 2 scheme that would aim to fulfil the original prime objectives.

1.2.2 The primary objectives are:

- To improve the resilience, reliability and capacity of the Blackbird Road/Ravensbridge Drive and Ravensbridge Drive/A6 junctions in order to support the upgrade of Anstey lane as well as supporting increases in orbital movements;
- To achieve an increase in the level of walking, cycling and public transport trips along Ravensbridge Drive and in the wider Waterside area, over and above any background increase in trips as a result of new development;
- To support improvements in road safety as a result of a reduced number of accidents and
- To facilitate future improvements to the Fiveways junction

1.3 Phase 2 (Stage 1): The preferred scheme

1.3.1 The preferred scheme option includes the following elements (see Appendix A):

- Junction improvements at Blackbird Road/Anstey Lane/Ravensbridge Drive, including:
    - Introduction of a second right turn lane from Blackbird Road South to Ravensbridge Drive
    - Introduction of a second outbound lane into Anstey Lane
    - Introduction of a third lane on the Ravensbridge Drive approach in order to provide a dedicated right turn lane, an ahead lane and an ahead & left lane.
- Junction improvements at the A6 St Margaret's Way/Ravensbridge Drive, including:
    - An additional lane for ahead and left movements from Ravensbridge Drive to St Margaret's Way on the approach to the junction
    - Raising the level of the carriageway to improve visibility for road users
    - Increasing the radius of curvature of the carriageway to improve the carriageway alignment
- Providing a shared walk/cycle path along Ravensbridge Drive

1.3.2 Junction designs are constrained by the limited space available in each location.

1.4 Scheme Costs

1.4.1 Table 1-1 presents a summary of the scheme costs for the Phase 2 (stage1) scheme. These figures include a 20% allowance for contingencies. Note that the figures in the column totals may not sum exactly to match the total figures due to rounding. At this stage, operating and maintenance costs have not been developed.

1.4.2 The majority of the costs presented relate to capital costs for scheme construction. There are no land costs associated with the preferred Phase 2 (stage 1) scheme.

Table 1-1 Summary of Phase 2 (stage 1) Scheme Costs (£ Million)

Phase 2 (stage 1)	Historic	Spend			Total
	2016/17	2017/18	2018/19	2019/20	
Works	0.00	0.00	3.68	0.00	3.68
Fees	0.03	0.35	0.27	0.00	0.65
Total	**0.03**	**0.35**	**3.95**	**0.00**	**4.33**

1.5 Scheme Impacts

1.5.1 For Phase2 (Stage 1) the strategic highways impacts are expected to be relatively minor, with the primary objective being to locally increase junction safety, reliability and capacity and to facilitate the delivery of a stage 2 scheme that is in the process of being developed.

1.5.2 Benefits to walkers and cyclists are anticipated due to the delivery of improved crossings at the junctions and a shared off-road cycle and footpath along Ravensbridge Drive.

1.5.3 The junction modelling tool LinSig 3 was used to assess the performance of the two junctions. The primary objective of the assessment was to demonstrate that the improvements would add capacity to the junctions, particularly for accommodating additional traffic between Ravensbridge Drive and Blackbird Road in order to facilitate the potential for diverting traffic from Woodgate, or accommodating additional orbital movements in a stage 2 scheme. The additional junction and vehicle storage capacity that is incorporated into the design increases the flexibility with which the Area Traffic Control (ATC) team can optimise and operate the junctions.

1.5.4 The results highlight that:

- Both junctions are operating close to, or above capacity in 2016
- With an unmodified pattern of movements, the improved designs provide for increased performance in both 2016 and 2026. The greatest benefit is for the PM Peak
- The existing designs could not accommodate a modification to the traffic flow to increase traffic flowing in both directions between the Blackbird Road (South) and Ravensbridge Drive. A Practical Reserve Capacity (PRC) of over -40% is forecast at the Anstey Lane/Ravensbridge Drive junction with 2016 traffic flows
- The improved designs provide for considerably greater performance in 2016 and 2026 with the modified patterns of traffic.

1.5.5 These results demonstrate that the junctions are in a highly congested part of the highways network, and that the modifications have increased the capacity that can be accommodated through the junction.

1.5.6 A strategic highways assessment of the improvements to the two junctions was undertaken using the LLITM model (Appendix E). The junction improvements represent relatively minor changes to the highways network within the strategic model. In addition, no changes were made that would have led to traffic being re-directed away from Woodgate, and so the model was effectively modelling the equivalent to the LinSig junction modelling of scenario 3.

1.5.7 From the outset it was recognised that undertaking a strategic assessment would only be able to provide limited insight, and a decision was made not to attempt to calculate quantative (monetised) economic benefits using the model due to the limitations in the assumptions.

1.5.8 A key requirement, however, was to demonstrate that the scheme would have an influence over a small geographic area. This is shown in Figure 1-2 and demonstrates that the Area of Influence (AOI) is within the Leicester City boundary extending to the A563 in the North West and the A6 in the East.

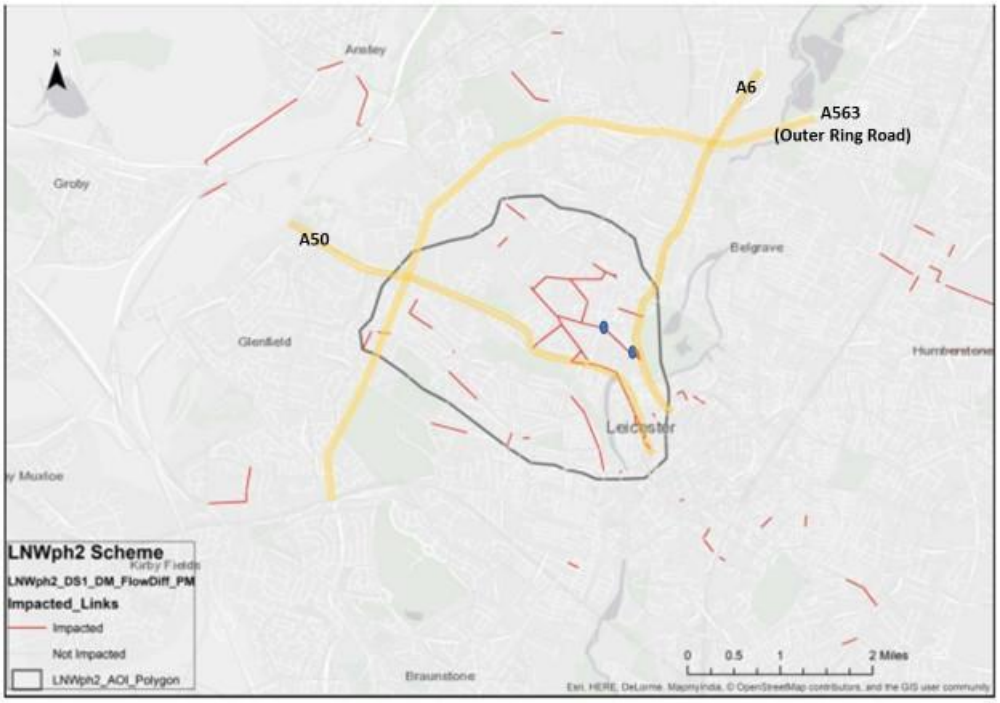


Figure 1-2: Scheme Area of Influence

1.6 Economic Benefits

1.6.1 A proportionate approach to appraisal has been adopted based upon the scale of the scheme and the likely benefits from the delivery of the stage 1 infrastructure.

1.6.2 The Present Value Costs (PVC) of the LNWMTP Phase 2 (part 1) scheme is estimated as £3.980M in 2010 prices. The scheme costs include a 20% contingency until final prices are confirmed, and an additional 15% optimism bias is included in the appraisal analysis.

1.6.3 The highways improvements are designed to improve safety, reliability and capacity at the two junctions, and to facilitate a greater volume of flow in both directions between Blackbird Road and Ravensbridge Drive. As this Phase 2 (Stage 1) scheme is designed as an enabler for future work in Phase 2 (stage 2), the highways element is not anticipated to provide significant highways benefits on its own.

1.6.4 In this appraisal, the Highways benefits are assumed to be neutral except for reliability and safety which are to be estimated to be slightly beneficial. Other highways benefits are appraised as neutral. In this proportionate business case the highways benefits have not been monetised.

1.6.5 The improvements to the walking and cycling infrastructure, however, are expected to be significant and have been estimated to produce £3.060M of benefits in 2010 Prices (Present Value Benefits -PVB).

1.6.6 Taking into account only the monetised benefits of walking and cycling the BCR of the scheme is estimated at 0.77 which is classified as poor. If the additional 15% optimism bias is removed and only the 20% contingency costs are included then the BCR rises to 0.88.

1.7 Scheme Delivery

1.7.1 The delivery of LNWMTP Phase 2 (part 1) will be led by Leicester City Council as the main scheme promoter. LNWMTP Phase 2 (part 1) forms the second phase in a multi-phase programme, and a similar approach to delivery will be adopted to Phase 1, which was delivered in partnership by Leicestershire County Council and Eurovia Contracting, and which is now fully complete.

1.7.2 The delivery strategy has been informed by a series of lessons learnt on other similar major highway schemes, including LNWMTP Phase 1 which was delivered in 2015/2016. The benefits of ECI and early appointment of a traffic management contractor were established, alongside the importance of conducting on-site surveys rather than relying solely on drawings.

1.7.3 The key delivery milestones is provided in Table 1-2.

Table 1-2 Key Milestone Dates

Milestone	Date
Early Contractor Involvement	January – June 2018
Public Consultation	April 2017 – May 2017
Business Case Submission to the LLEP/LLTB	May 2018
Final Design Approval	May 2018
Start of Construction	Summer 2018 (subject to Traffic Management coordinating considerations)
Construction Period	Summer 2018 to Summer 2019
Scheme Opening Date to Traffic	September 2019

1.7.4 The target date for the start of construction is Summer 2018, subject to Traffic Management coordinating considerations, with completion forecast for by late Summer 2019. The ability to start work on site in Summer 2018 is dependent on the Business Case being approved by the LLEP in May 2018 and subsequent approval for funding drawdown to commence as well as the construction contract with Tarmac signed by 3rd June 2018 before the end of MHA MSF2.

1.7.5 The on-site works will be phased to minimise disruption to traffic as far as possible. The Ravensbridge Drive/A6 junction improvements will be constructed first with the assistance of a full road closure when Traffic Management allows, so that the road levels can be built up. The Blackbird Road/Anstey Lane junction improvements will with works being phased at each arm of the junction. Resurfacing and the introduction of the shared use footway/cycleway along the length of Ravensbridge Drive will also be incorporated into the programme.

1.7.6 Public consultation was carried out in April/May 2017 (Appendix D). This was in the form of consultation materials that were distributed online via the City Council website and printed copies distributed to affected property owners and local communities. A public exhibition was also held to which members of the public were invited to obtain more information, ask questions and give support for the scheme

1.7.7 A high level risk management strategy for LNWMTP as a whole was included in the Project Initiation Document, that captures programme level risks and mitigation actions. Detailed risk logs are then prepared for each individual phase, which document the project-specific risks.

1.7.8 An outline monitoring and evaluation plan has been put in place to assess the impacts and outcomes of the Phase 2 (stage 1) scheme. This has been developed in accordance with the DfT's Monitoring and Evaluation Framework for Local Authority Major Schemes (September 2012), and with reference to other relevant guidance, including the DfT's Local Sustainable Transport Fund (LSTF) Monitoring and Evaluation Framework (December 2012).

2 Strategic Case

What is the problem the scheme means to address, what options have been considered, and why does this solution meet the requirements?

2.1 The Vision for Leicester

2.1.1 The Leicester and Leicestershire economy is the largest in the East Midlands; an economic powerhouse positioned at the heart of the county that benefits from excellent intra-regional connectivity by road, rail and air. Worth £19.4 billion a year, the Leicester and Leicestershire economy is central to the prosperity of the wider region, supporting 435,000 jobs and 33,000 businesses[3] . The wider Midlands Engine region, which comprises 11 separate Local Enterprise Partnership (LEP) areas, makes a £222 billion annual contribution in Gross Value Added (GVA) to the UK economy, which has grown by 30% in the last decade[4] .

2.1.2 Underpinning this economic importance are a series of competitive advantages that set Leicester apart from its competitors. Its strong industrial heritage is still evident today, with a growing manufacturing sector supported by infrastructure that includes the largest distribution park in Europe and the UK's second largest freight airport. The knowledge economy is also strong, with world class universities delivering cutting edge innovation.

2.1.3 In its Strategic Economic Plan (SEP), the Leicester and Leicestershire Economic Partnership (LLEP) sets out a vision to create 'a vibrant, attractive and distinctive place with highly skilled people making Leicester and Leicestershire the destination of choice for successful businesses.' By 2020, the ambition is to create 45,000 new jobs, lever in £2 billion of private investment and increase Gross Value Added (GVA) from £19 billion to £23 billion.

2.1.4 These ambitious aims will be achieved by:

- Investing in infrastructure to unlock key development sites and improve connectivity;
- Providing effective support for SMEs and accelerating the growth of priority sectors; and
- Ensuring that local people are equipped with the relevant skills that businesses need.

2.1.5 The Leicester and Leicestershire Growth Deal submissions set out how the LLEP plans to achieve the vision and objectives presented in the SEP using funding from the Local Growth Fund, with a focus on enhancing transport connectivity, investment in skills infrastructure and business support, flood risk management and investment in supporting infrastructure such as superfast broadband.

2.1.6 In Round One (July 2014), Leicester, Leicestershire and central government jointly agreed to invest £80 million in a number of strategic development projects, including Waterside Regeneration Area in central Leicester. In Round Two (January 2015), the LLEP was

[3] Leicester and Leicestershire Strategic Economic Plan 2014-2020, Leicester and Leicestershire Economic Partnership March 2014
[4] The Midlands Engine for Growth Prospectus

allocated a further £20.3 million, bringing the total allocation to over £100 million over the period 2015-2021, which is forecast to deliver up to 3,000 jobs and 1,300 homes.

2.1.7 A third phase of Growth Deal funding, which was announced in 2016, builds on the success of the first two phases, aiming to address outstanding critical challenges such as low productivity per head, skills deficits in key sectors, housing shortage and congestion on key routes. The third phase includes significant investment in a number of strategic transport projects, with a focus on city centre assets such as the rail station, walking and cycling links and the development of Leicester Waterside infrastructure. The LLEP anticipates that over 13,000 jobs, up to 15,000 houses and approximately £250 million in GVA growth will be delivered through the Growth Deal in the period to 2025.

2.1.8 The delivery of an effective, reliable, well-functioning transport network is key to successfully achieving the vision for Leicester and the wider Midlands Engine region. Transport is not simply an end in itself, it is an enabler of growth and social inclusion; both in terms of enabling local residents to access education, employment and training opportunities and in terms of attracting private sector inward investment. However, gaps in connectivity and issues of delay and congestion will limit the extent to which the local economy can grow and develop. It is estimated that improving transport links to speed up journey times across the Midlands could boost the regional economy by more than £1 billion per annum, create 300,000 additional jobs and save businesses nearly £500 million[5]

2.1.9 The SEP recognises the importance of transport connectivity in terms of enabling the development of major sites for housing and employment. It sets out five priority growth areas, which include Leicester urban area, and four transformational priorities that will enable its overall vision to be achieved: Leicester Launchpad, East Midlands Gateway Rail Freight Interchange; Loughborough University Science and Enterprise Parks and Horiba MIRA Technology Park Enterprise Zone.

2.1.10 Leicester Launchpad is identified as a major development opportunity focused on the Waterside and Abbey Meadows regeneration areas and Leicester city centre. As a Strategic Regeneration Area (SRA), the area acts as a 'launchpad' to deliver significant residential, commercial and leisure developments that could lead to the creation of 6,000 jobs. Leicester North West Major Transport Investment Corridor (A50/A6) is named as one of the key strategic transport projects that can help to unlock development in the launchpad area and accommodate growth in wider north-west Leicester that will generate additional traffic on the A50 and A6 corridors.

2.1.11 In its third Local Transport Plan (LTP) for Leicester[6], Leicester City Council sets out a vision 'to help transform Leicester into Britain's sustainable city that will be a great and prosperous place to live but also somewhere that does not place a burden on the planet in future years'. It recognises that the most important objective for achieving this vision is to reduce congestion and improve journey times, supported by a series of other objectives that include:

- Improving connectivity and access;
- Improving safety, security and health;
- Improving air quality and reducing noise;

[5] The Midlands Engine for Growth Prospectus
[6] Leicester Local Transport Plan 3 2011-2026, Leicester City Council 2011

- Reducing carbon emissions;
- Manage to better maintain transport assets; and
- Improving quality of life.

2.1.12 As a principal place of employment and focus for regeneration activity, Leicester city is recognised as a key priority area for transport improvements; 'the city is seen as gloomy and grey, with the 'concrete necktie' of the ring road turning the city into a disparate jumble of disconnected parts[7] '.

2.1.13 Leicestershire County Council also recognises the importance of investing in transport to deliver improved economic and social outcomes, supporting a growing economy and building strong, sustainable and healthy communities. Its long-term vision as set out in its third LTP[8] is for 'Leicestershire to be recognised as a place that has, with the help of its residents and businesses, a first-class transport system that enables economic and social travel in ways that improve people's health, safety and prosperity, as well as their environment and their quality of life.'

2.1.14 However, it also recognises that a balance must be struck between increasing transport capacity to support economic prosperity and social inclusion, and changing travel behaviour to mitigate against the social and environmental impacts of a growing demand for travel in the context of inward investment, regeneration and population increase. In order for the right balance to be achieved, greater numbers of people need to choose public transport, walking and cycling for their daily journeys.

[7] Leicester Local Transport Plan 3 2011-2026, Leicester City Council 2011
[8] Leicestershire Local Transport Plan 3 2011-2026, Leicestershire County Council 2011

2.2 The Waterside Regeneration Area

Figure 2-1: Leicester Waterside

2.2.1 Leicester Waterside is the City's flagship regeneration project comprising around 60 hectares of land between the River Soar and Leicester city centre along the corridor of the A50, as detailed in the Leicester Waterside Supplementary Planning Document (SPD). It is a gateway to Leicester city centre and has significant potential for economic and physical transformation over the next 10-15 years to create a high quality residential-led mixed use neighbourhood which connects the city centre to the waterfront. The vision for Leicester Waterside as set out in the SPD is:

- A thriving urban neighbourhood offering a unique and vibrant place to live and space for local businesses to flourish;
- A place that reconnects Leicester to its waterfront, bringing opportunities for leisure, green connections and wildlife;
- A place where people feel safe and comfortable to walk and cycle through, and to the city centre;
- A place where the streets and homes are built to high standards of design and sustainability; and
- A confident place which values its history while embracing the future.

2.2.2 By the end of 2031 (the horizon year for the emerging local plan period) it is anticipated that the development will consist of around:

- 2,200 to 2,800 Dwellings
- 500,000 sqft B1a office space
- 20,000 sqft of neighbourhood shopping (retail)

2.2.3 Investment in the Waterside is significant, not only by the City Council, but also by private developers:

- Waterside Phase 1 £70m
- Charles Street Buildings £50m
- Sowden Group £40m
- Watkin Jones Group £50m
- Friar Mills £9m
- Jaime Lewis £54m

2.2.4 However, to fully address the vision for Waterside the issue of severance needs to be addressed at Woodgate, Frog Island, Highcross Street and Sanvey Gate where high levels of traffic from through traffic combined with traffic generated within Waterside do already form a barrier to movement and contribute to a poor local environment.

2.3 Key Issues and Opportunities

2.3.1 This section identifies the key social, economic and environmental issues in Leicester that currently limit its ability to grow and develop, and the ways in which the transport network acts as a constraint to achieving the wider vision. It also highlights the significant opportunities that exist to target strategic investment towards areas with high growth potential and enable Leicester to deliver on the ambitious economic development targets set out in the SEP and ultimately fulfil its growth potential.

2.3.2 Although the local economy is showing strong signs of growth, with a £3 million increase in GVA recorded between 2013 and 2016[9] , many challenges still remain, which will become even more pressing in the context of continued population growth. Leicester's population has grown by 17% since 2001[10] , a rate more than double the national average, and the Leicester City Local Development Framework (LDF) Core Strategy[11] identifies a need for 25,600 new homes between 2006 and 2026, which will increase the demand for travel and consequently place additional pressures on local infrastructure.

2.3.3 Leicester's transport network is comprised of a classic city centre hub and spoke arrangement, with inner (mainly dual carriageway) and outer (mainly single carriageway) ring roads. The radial routes that link to these ring roads operate close to capacity in the morning and evening peak periods and have closely spaced junctions which contribute to low traffic speeds. The city centre highway network is generally tight and compact, with Victorian junction layouts and properties situated close to the highway boundary, that offers little space for significant new provision.

[9] Leicester and Leicestershire Strategic Economic Plan 2014-2020, Leicester and Leicestershire Economic Partnership March 2014
[10] Leicester and Leicestershire Strategic Economic Plan 2014-2020, Leicester and Leicestershire Economic Partnership March 2014
[11] Leicester City Local Development Framework Core Strategy, Leicester City Council, November 2010

2.3.4 In addition, the existing transport network is concentrated towards the western parts of Leicester and Leicestershire, which creates significant pressures for development in those areas. However, issues of congestion and accessibility act as a constraint to development, and it is recognised that interventions are required in order to deliver the level of residential development required and enhance the attractiveness of Leicester as a location for inward private sector investment.

2.3.5 The level of investment and development planned in north west Leicester in particular will place significant additional pressure on the highway network. Waterside is one of five key intervention areas identified in the original (2003) Leicester City Centre Masterplan, which is now identified as a major mixed-use development opportunity as part of the Leicester launchpad set out in the SEP and as part of the city's SRA identified in the LDF Core Strategy.

2.3.6 Occupying 60 hectares along the A50 corridor between the city centre and the River Soar, Waterside has the potential to deliver nearly 2,800 new homes by 2026 as part of a high quality residential-led mixed use neighbourhood which connects the city centre and the waterfront. The vision for Waterside, that is set out in the Waterside SPD[12], is for a *'thriving urban neighbourhood…a place that reconnects Leicester to its waterfront…a place where people feel safe and comfortable to walk and cycle through, and to the city centre.'*

2.3.7 Early transport assessment work concluded that Waterside is well suited to encouraging walking and cycling trips to and from the city centre, provided that severance on the A50 is reduced and improvements to route infrastructure are delivered. The River Soar and Grand Union Canal limit its connectivity to the west and traffic congestion issues along the A50 present a constraint to development. Unreliable journey times along this stretch of the A50, which is a main bus route into and out of the city centre and areas to the west of the city centre, cause issues for public transport users.

2.3.8 The aspiration is to reduce the existing traffic dominance along the A50 between Blackbird Road and Vaughan Way; in particular to re-route a proportion of through traffic and to improve the quality of the public realm through the provision of wider footways, improved on-street parking facilities and enhanced frontages.

2.3.9 Importantly, the Waterside area should present a distinctive character and clear identity that reflects its position at the historic heart of Leicester and its strategic location on a key route into the city centre, adjacent to the Highcross Centre. This is currently hampered by the existing high levels of derelict and vacant properties and a relatively poor-quality environment, as illustrated in Figure 2-2

[12] Leicester Waterside Supplementary Planning Document, Consultation Draft, January 2015

Figure 2-2 Derelict Buildings on Soar Lane

2.3.10 Planning permission has been granted and construction implemented for development comprising up to 500 residential dwellings, up to 5,500 square metres of B1 business use, up to 1,000 square metres of retail use and associated highway improvements, car parking, improved footways and green infrastructure. Leicester City Council has now entered into a partnership with Keepmoat Limited as its development partner and took vacant possession of the full site in February 2018.

2.3.11 A further key development site is located at Ashton Green, adjacent to the A46 Western Bypass, Beaumont Leys and Leicester Road. It occupies a 130-hectare greenfield site, with an allocation for up to 3,000 new homes, 10 hectares of employment land, a commercial village centre and 50 hectares of green space. Parcels of land will be brought forward for development in four phases between 2015 and 2035. Other large-scale developments at Abbey Meadows (a science park and residential development) and on the site of the former Charles Street Police Station (office development) demonstrate the level of investment and regeneration taking place in this area of the city, and will give rise to an increasing demand for travel.

2.3.12 Assessment work has been carried out on existing and forecast traffic demand in a 'wedge' area around the A50 Groby Road/Woodgate and the A6 Loughborough Road, as the focus area for major commercial and residential development and associated additional development trips. This work highlights a number of key issues that are likely to compound as development comes forward, particularly at Waterside in the vicinity of the A50

Woodgate. There are also a number of opportunities to improve infrastructure provision, particularly for pedestrians and cyclists.

2.3.13 The Leicester and Leicestershire Integrated Transport Model (LLITM) has been used to assess the existing (2016) situation and future forecasts (2026) for the AM and PM peak periods. The findings for the A50/A6 wedge area are presented in Table 2-1

Table 2-1: A50/A6 Wedge Area Findings[13]

	AM Peak				PM Peak			
	Traffic Pcu-km	Travel Time Pcu-hrs	Delay Pcu-hrs	Speed kph	Traffic Pcu-km	Travel Time Pcu-hrs	Delay Pcu-hrs	Speed kph
2016	79,029	2,932	137	27.0	78,521	2,871	130	27.4
2026	89,269	3,565	182	25	89,850	3,551	165	25.3
Change	13 %	22%	33%	-7%	14%	24%	27%	-8%

2.3.14 The findings demonstrate that in 2026, traffic is forecast to increase by around 13 to 14% in the network peak hours, resulting in an increase in travel time, increased delay and lower average speeds. In the AM peak in particular, the delay is forecast to be 32.8% higher in 2026 than in 2016.

2.3.15 Congestion hotspots are identified at the key junctions of the A50/Fosse Road North, the A50/Sanvey Gate, the A6/Blackbird Road and the A6/Sanvey Gate. These hotspots, coupled with congestion on key routes, particularly the A5630/B5327 Anstey Lane, Fosse Road North, Blackbird Road and Abbey Park Road, lead to bus journey time reliability issues. This is particularly the case along the central A50 corridor, which is the key bus corridor into and out of the city centre for journeys to and from the north and west.

2.3.16 The A50/Fosse Road North is identified as the number one priority junction in terms of the severity of congestion/delay hotspots in the wedge area, and Ravensbridge Drive is identified as the number one priority link for improvement. These issues of traffic congestion and delay cause a number of secondary impacts, including contributing to poor air quality.

2.3.17 Analysis of the potential impact of the Waterside development on the local highway network has also been examined, as described in the 'Leicester Waterside Transport Mitigation Assessment'[14] . Examination of the actual and percentage change in turning movements at key junctions for the with and without scheme scenarios for 2031 shows that for the A50/Soar Lane/Sanvey Gate junction there is forecast to be a 64.7% increase in the AM peak and an 89.4% increase in the PM peak. Other junctions in the area are also forecast to experience an increase in turning movements, including Abbey Gate/Woodgate (a 10.3% increase in the AM peak and a 7.6% increase in the PM peak) and Great Central Street/Vaughan Way (a 13.3% increase in the AM peak and a 12.7% increase in the PM peak).

[13] Extracted from a presentation prepared for the Strategic Modelling LNWMTP Management Meeting, April 13th 2016. See Appendix D

[14] Leicester Waterside Transport Mitigation Assessment (Arcadis UK Consulting, March 2016), see Appendix D

2.3.18 Without mitigation these increases in traffic movements will significantly add to existing issues of congestion and delay.

2.3.19 A key issue is road safety is road safety which the City Council has a duty to investigate and take action to reduce casualties. The Leicester LTP3 notes that 67% of killed and seriously injured casualties are vulnerable road users, i.e. pedestrians, cyclists and motorcyclists. Key junctions in the city centre such as Fiveways have insufficient, narrow pedestrian crossing facilities, and issues with lane discipline and traffic not observing the signals contribute to a higher than average accident record.

2.3.20 Accident analysis for key junctions and links in the city centre demonstrates some of the prevailing issues. Analysis was undertaken for the following three junctions and four links, for the most recent five-year period (November 2011 to December 2016):

- Junctions:
  - Fiveways;
  - Blackbird Road/Ravensbridge Drive/Anstey Lane; and
  - Ravensbridge Drive/A6 St Margaret's Way.
- Links:
  - A50 Woodgate;
  - Blackbird Road;
  - Ravensbridge Drive; and
  - Abbey Gate.

2.3.21 The analysis shows that there were a total of 95 recorded injury accidents during the five year period, 13.7% of which involved pedestrians, 11.6% of which involved pedal cyclists and 5.3% of which involved motorcyclists. Overall, nearly a third of accidents involved vulnerable road users.

2.3.22 A number of key issues relating to the design and geometry of the junctions that contribute to accidents can be identified from the data:

- **Fiveways** – four recorded accidents involving pedestrians crossing over Blackbird Road north who failed to observe the red signal and five recorded accidents involving vehicles failing to observe the internal stop line through the Fiveways junction.
- **Ravensbridge Drive/St Margaret's Way/Abbey Gate** – confusion over priority, with four accidents relating to vehicles turning in and out of Abbey Gate across other vehicles.
- **Anstey Lane/Blackbird Road/Ravensbridge Drive** – four accidents involving conflict between right turning vehicles from Blackbird Road into Ravensbridge Drive and the opposing flow from Blackbird Road southbound.

2.3.23 The Leicester North West Major Transport Project (LNMWTP) has been developed in response to these key issues. The next section sets out the Background for the development of the LNW Project

2.4 The Leicester North West Major Transport Project

2.4.1 LNWMTP is a £19 million scheme that combines highways improvements, enhanced walking and cycling infrastructure and complementary Smarter Choices initiatives to support regeneration and development in North West Leicester in line with the objectives set out in the Leicester Strategic Economic Plan (SEP) and Local Transport Plan 3 (LTP3).

2.4.2 LNWMTP combines two separate transport projects that were prioritised for the 2015-2019 Spending Review period by the Leicester and Leicestershire Transport Board (LLTB). The scheme was granted programme entry to the local major schemes prioritisation process following the submission of a Strategic Outline Case to the Leicester and Leicestershire Local Enterprise Partnership (LLEP) in 2014. Conditional funding approval was subsequently granted for funding to be drawn down from the Local Growth Fund (LGF), which is dependent on obtaining approval from the LLEP for Full Business Cases developed for each phase of work.

2.4.3 The primary objective of LNWMTP is to support the continued development of the Leicester and Leicestershire economy through the implementation of a balanced strategic transport strategy in the local area. The strategy seeks to maximise use of the existing network and manage the demand for vehicle travel through the delivery of improvements to active travel infrastructure, to help reduce congestion at traffic hotspots.

2.4.4 The improvements that will be delivered through LNWMTP are targeted in a wedge around the A50 Groby Road / Woodgate and the A6 St Margaret's Way, as shown in Figure 2-3. The wedge is a strategic location in central Leicester that contains key trip attractors such as County Hall and which is the focus for major residential and commercial regeneration at Waterside, Abbey Meadows and Ashton Green.

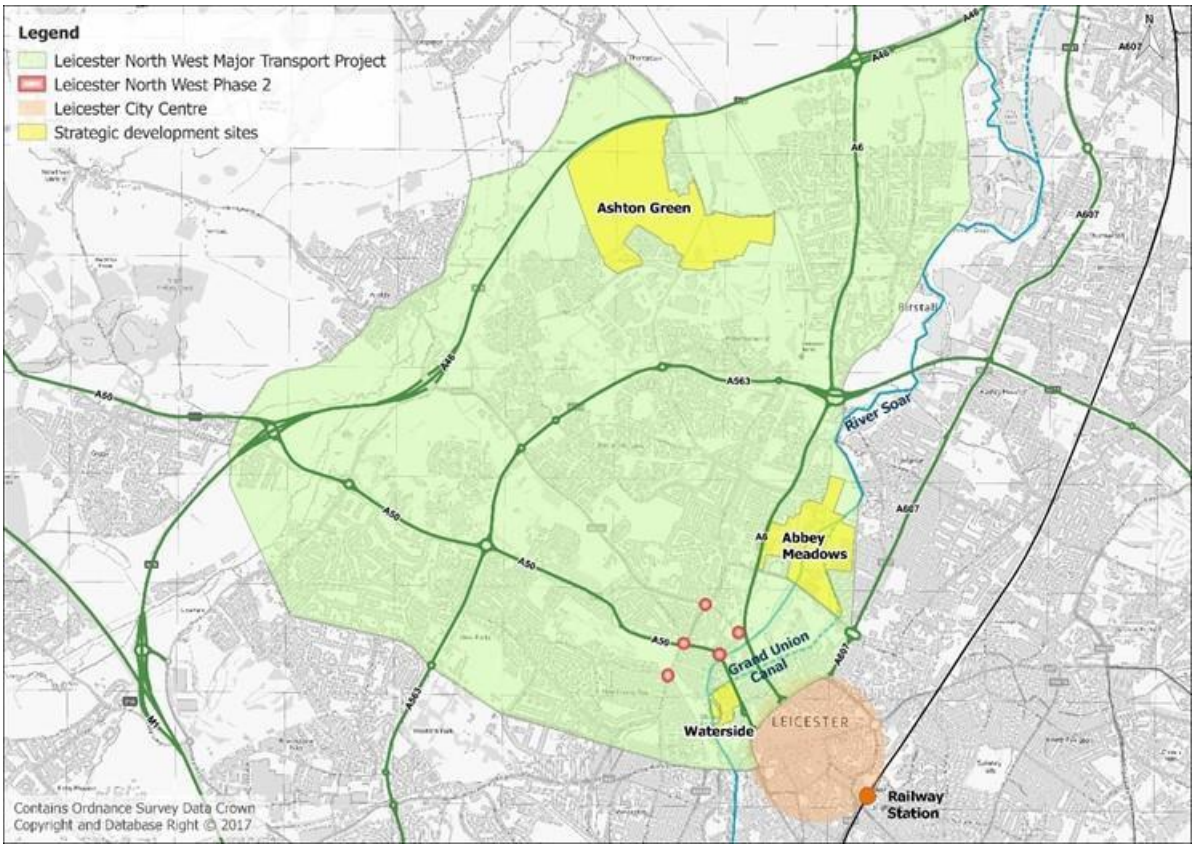


Figure 2-3: Leicester North West Strategic Location Plan

2.4.5 In 2016 Leicester City Council and Leicestershire County Council delivered the first phase of improvements to the A50 and A6 wedge as part of the Leicester North West Major

Transport Project. Details of the business case for this scheme can be found in Appendix D .

2.5 Phase 2 Scheme Option identification and Assessment

2.5.1 A long list of 16 schemes was identified within the A50/A6 wedge, each of which underwent an initial assessment using an adapted version of the DfT's Early Assessment and Sifting Tool (EAST) that incorporated criteria based on local factors relevant to Leicester and Leicestershire. These were identified based on the priorities set out in the Strategic Economic Plan developed by the LLEP, LTP3 objectives developed by Leicester City Council and Leicestershire County Council and a series of objectives identified at a Leicester North West project workshop.

2.5.2 Each scheme was assessed against a number of economic, social and environmental criteria, and weightings were assigned to the various criteria based on their relative importance. The Value for Money (VfM) of each option was also considered. Table 2-2 illustrates the results of this initial high-level sifting process based upon a locally enhanced version of the DfT East Appraisal and Sifting Tool (EAST+)[15].

2.5.3 It can be seen that Schemes 2 (A50 Diversion), 1 (Bottom of A50 and A6) and 8 (Anstey Lane A563 to A46) were awarded the highest scores, significantly higher than any of the alternative options considered. These three schemes were taken forward for further assessment and were subsequently renamed as

- Scheme A – Waterside South;
- Scheme B – Waterside North; and
- Scheme C – Outer Ring Road Improvements supporting Leicester Regeneration Areas and Strategic Housing Development Areas

2.5.4 A description of these schemes is provided in the following sections, alongside commentary on the assessment of each scheme that supported identification of the preferred Phase 2 option.

[15] see Appendix D

Table 2-2: EAST+ Sifting Process Results

		SCORE	TOTAL COST	VFM	LEP Objectives	LTP3 Objectives	LNW workshop vision
Scheme 2: A50 Diversion (inc A6/B8 road)	2	87.5	10.0	3	54	8	4
Scheme 1: Bottom of A50 and A6	1	84	14.5	2	51	8	8
Scheme 8: Anstey Lane A563 to A46 (inc ORR from NPW to Stasbourg)	8	81.5	12.0	2	49	8	
Scheme 11: A563- Glenfield Rd/Dominion Rd Jct (include ped crossings)	11	48.5	2.0	1	24	6	
Scheme 13: A6 Commuting cycling	13	45	7.0	2	22	6	
Scheme 5: A6 SCOOT	5	34.5	0.1	2	16		4
Scheme 7: Anstey Lane Walking and Cycling Corridor	7	30.5	1.5	3	12	6	-4
Scheme 6: Beaumont Leys Lane	6	29.5	3.0	1	23	4	-8
Scheme 4: A6 B&Q junction (A6/B5327)	4	26	0.1	1	9	2	4
Scheme 10: Glenfield Hospital PT interchange	10	23.5	1.0	1	6	5	
Scheme 17: Walk/Cycle Glenfield to Anstey	17	20.5	1.0	3	6	4	-4
Scheme 15: A6 Bus Priorities Rehill to Birstall	15	15	2.0	1	7	4	-4
Scheme 3: Fosse Road North	3	7.5	0.2	2	4		-8
Scheme 16: Walk/Cycle Glenfield Rail Tunnel	16	6	2.0	2	3	2	-4
Scheme 12: Redhill Circle PT access	12	-0.5	1.0	1			-4
Scheme 9: DELETE (Combined with scheme 8)	9	-26.5		-3	0		-8
Scheme 14: DELETE A6 Hallam Fields to A46 (local safety scheme)	14	-26.5		-3	0		-8

2.5.5 Scheme A – Waterside South

2.5.6 Scheme A, which has an estimated total cost of £14.5 million, includes the delivery of highway improvements in Waterside South, including the A50/Sanvey Gate, A6/Sanvey Gate, A6/A594, A50/A594 and Great Central Street junctions. The scheme would also incorporate infrastructure enhancements for pedestrians, cyclists and public transport users. A schematic representation of Scheme A is provided in Figure 2-4

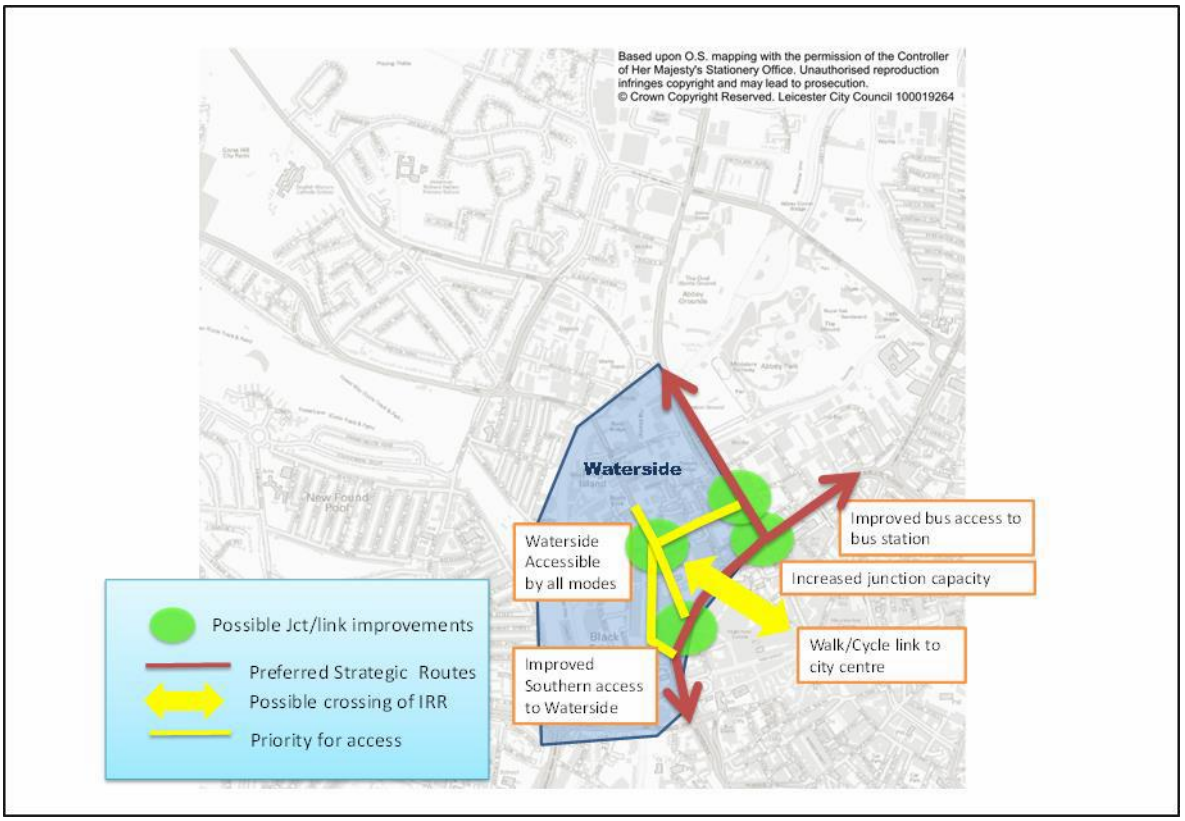


Figure 2-4: Scheme A – Waterside South

2.5.7 The main objective of Scheme A is to re-establish the A50 as a place rather than as a link, through:

- Improved traffic flows to support the Waterside development and key shopping areas to the north of the city centre such as Highcross;
- Improved radial movements on the A50 and A6 and orbital movements on the A594;
- Reductions in journey times and improved journey time reliability;
- Improved accessibility by walking, cycling and public transport; and
- Improved accessibility to and from St Margaret's bus station.

Scheme B – Waterside North

2.5.8 Scheme B, which was estimated to cost in the region of £10 million, focuses on rerouting through traffic away from the A50 and the Waterside development area and towards the A6, using Blackbird Road and Ravensbridge Drive as the key access route. This would then create a much more attractive frontage to the development, and enhance its attractiveness as a place to live and work.

2.5.9 The scheme primarily consists of junction improvements at three key junctions: the A50/Blackbird Road, Blackbird Road/Anstey Lane and Ravensbridge Drive/Abbey Gate/A6, but could also include other junctions and improvements to links within the area that support the key objectives, including the A6/Blackbird Road junction (B&Q junction) to extend the orbital capabilities to the A607/A47 (E). The schematic plan for Scheme B is shown in Figure 2-5.

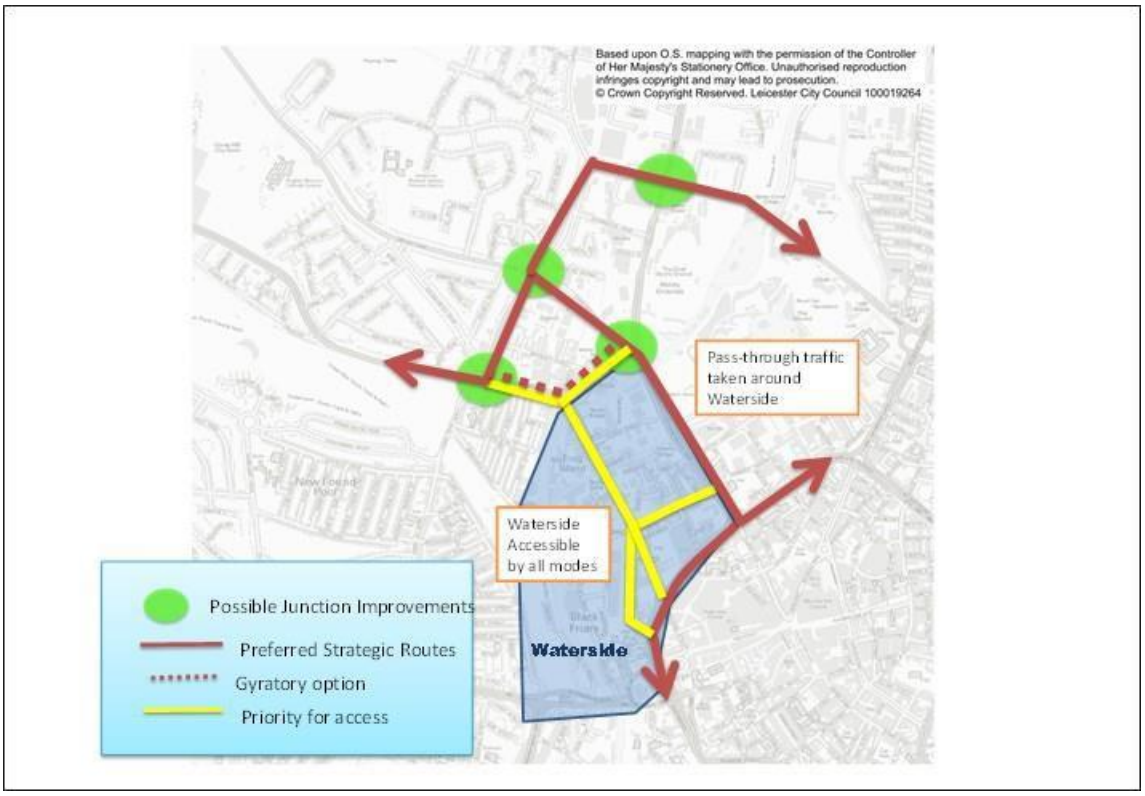


Figure 2-5: Scheme B – Waterside North

2.5.10 The main aims of Scheme B are to:

- Reduce the volume of through traffic in Waterside, leading to the delivery of an enhanced environment for active travellers, improved journey time reliability for public transport users and the creation of a public realm that reflects the city centre mixed use character of Waterside;
- Improve inbound and outbound accessibility between the city and the county for commuter, business and commercial movements;
- Facilitate more effective vehicle movement in the north-western part of the city centre;

2.5.11 **Scheme C – Outer Ring Road Improvements supporting Leicester Regeneration Areas and Strategic Housing Development Areas**

2.5.12 Scheme C, which is estimated to cost in the region of £12 million, incorporates a number of highway improvements designed to alleviate issues of congestion and queueing in the outer ring road area at peak times, by improving orbital and distributor movements to direct traffic towards the most appropriate radial entry/exit route. Specifically, the scheme looks to increase the orbital capacity between the New Parks Way roundabout and Strasbourg Drive in order to facilitate appropriate orbital movement and support the retail, commercial and industrial activities at Ashton Green and Beaumont Leys.

2.5.13 The scheme includes:

- Improvements to the highways between the A46 and the Bennion Road roundabout, with the two-lane dual carriageway extended over the full length;

- Increased capacity of the Bennion Road/Anstey Lane and Anstey Lane/A563 roundabouts achieved through a combination of signalisation and lane improvements;
- Widening of the A563 between Anstey Lane and Strasbourg Drive; and
- Dualling the carriageway between the A50 New Parks Way roundabout and Anstey Lane.

2.5.14 A representation of Scheme C is shown in Figure 2-6.

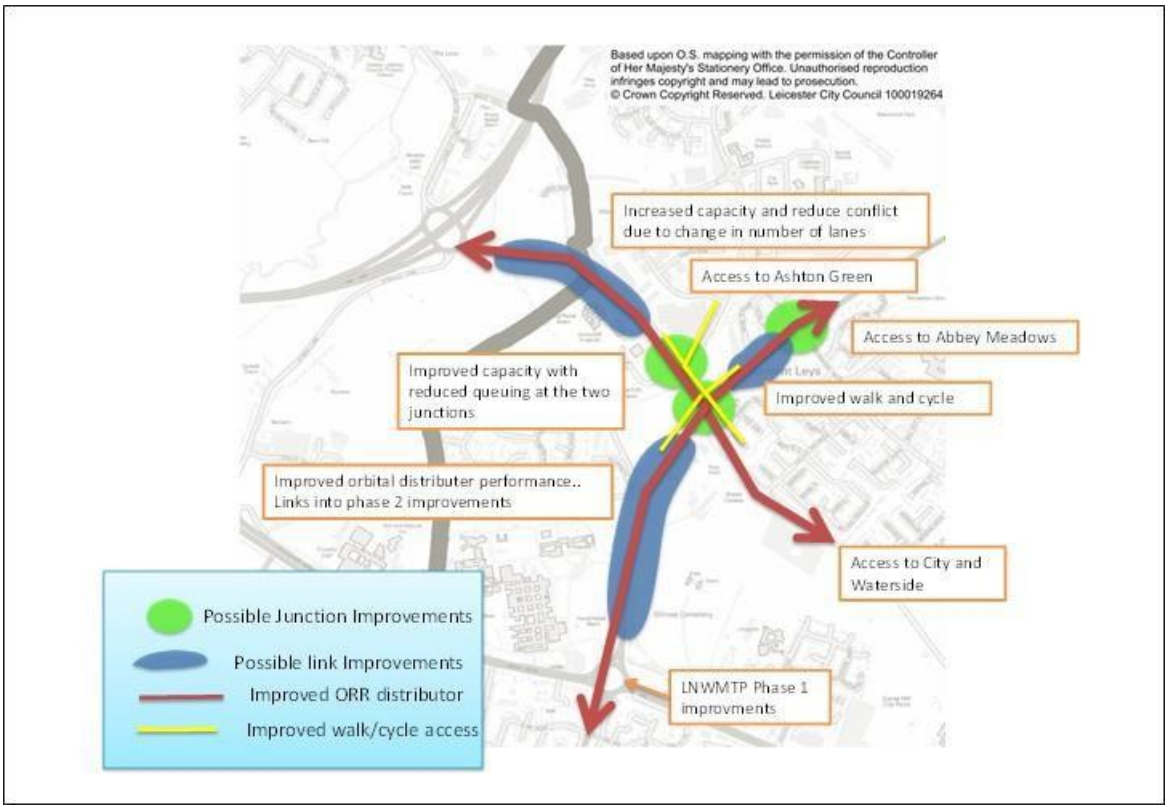


Figure 2-6: Scheme C – Outer Ring Road Improvements

Identification of the Preferred Option

2.5.15 Further assessment of each of the shortlist of three schemes led to the identification of Scheme B as the preferred scheme option for LNWMTP Phase 2 to take forward to a Full Business Case, as reported in Technical Note 47[16] . Each scheme was assessed in terms of its deliverability, identified design constraints and whether alternative funding opportunities are available that could lead to a scheme being brought forward separately outside of LNWMTP.

2.5.16 At that time, there was no masterplan available for the redevelopment of Waterside; therefore it was not considered feasible to develop meaningful concept designs for Scheme A due to uncertainty over the planning applications that may come forward. In addition, it was considered that the benefits of Scheme A would only be realised following

[16] Technical Note 47: LNWMTP Scheme Recommendation Phase 2, Edwards and Edwards Consultancy, 9 February 2016

the delivery of Scheme B. Therefore Scheme A was discounted as the Phase 2 scheme option and held in reserve for potential re-evaluation at a later date.

2.5.17 With regard to Scheme C, a number of design constraints were identified that need to be overcome before concept designs can be produced that meet all of the scheme objectives, including the requirement to support conflicting movements and the need for political and public consultation to identify which movements should be prioritised. There is also a potential impact on the Strategic Highway Network (SRN), which would require consultation with Highways England. These constraints meant that Scheme C could potentially take much longer to deliver than Scheme B.

2.5.18 In addition, a number of potential alternative funding opportunities were identified for exploration with respect to Scheme C, including Highways England and Midlands Engine for Growth funding. No such opportunities were identified for Scheme B. It was therefore recommended that Scheme C be prioritised behind Scheme B, but that a strategic case and concept designs be developed in order to bid for other funding opportunities.

2.5.19 Within the Scheme B area, the junctions were assessed as operating close to capacity, and are forecast to become severely congested by 2026. Although the identified physical constraints were felt to restrict the number of feasible design options, this was also viewed as a positive in terms of the time needed for scheme development and overall deliverability in accordance with the timescales for LGF funding.

2.5.20 In addition, Scheme B was assessed to perform the best of the three options in terms of supporting the growth and regeneration objectives of the LLEP and supporting improved accessibility between the city and the county. However, it was recognised that the Business Case for Scheme B would not be able to rely on highways benefits, and that wider benefits such as active travel benefits would also be required to make the case for investment.

2.5.21 Subsequently the Project Board selected Waterside North project to be progressed and for a scheme to be developed. (see Appendix D)

2.6 Phase 2 Objectives

2.6.1 The main aim of the Phase 2 scheme is to support the development at Waterside by diverting a proportion of the existing traffic from the A50 Woodgate between Fosse Road North and Abbey Gate to accommodate a forecast increase in trips associated with the development, and to facilitate wider regeneration in the local area through the provision of improved public realm and a more attractive environment for walking and cycling. It will be important to consider the needs of the different users and to strike a balance between residents and businesses who need to access areas outside Waterside and drivers who need to travel through Waterside to access their destination which could be either inside or outside the city boundary.

2.6.2 In addition, there is an aspiration to accommodate and support the strategic residential and commercial development taking place in wider north-west Leicester at Ashton Green, Glenfield and Coalville. Due to the location of these developments outside of the city centre, and the limited public transport options in some areas, the majority of trips associated with these developments are expected to be car based. By encouraging

shorter distance city centre trips to be made by walking and cycling, and longer trips by public transport, those trips from developments with poorer public transport connectivity can more easily be accommodated.

2.6.3 With this in mind, a series of primary and secondary objectives have been developed for LNWMTP Phase 2. The primary objectives are the direct objectives that the scheme aims to support, which together support the wider aim for the LNWMTP, which is to develop a balanced transport strategy to support economic growth in Leicester and Leicestershire. The secondary objectives are wider economic and social objectives that the scheme will contribute to, which have been designed to align with the LTP3 and SEP objectives for Leicester.

2.6.4 The primary objectives are as follows:

- To reduce the amount of through traffic using the A50 Woodgate, with traffic re-routed to alternative routes, primarily focused on Blackbird Road, Ravensbridge Drive and Anstey Lane;
- To improve the quality of the public realm along the A50 Woodgate and to better reflect its role as a high-quality city centre mixed-use area;
- To achieve an increase in the level of walking, cycling and public transport trips along the A50 Woodgate and in the wider Waterside area, over and above any background increase in trips as a result of new development; and
- To improve the journey time reliability of bus services along the A50 Woodgate, and achieve increased patronage on local bus services.

2.6.5 The secondary objectives are as follows:

- To contribute towards improved levels of health and wellbeing amongst residents of Waterside and the wider city centre as a result of an increase in physical activity;
- To reduce carbon emissions and contribute towards an improvement in air quality and a reduction in noise levels along the A50 Woodgate;
- To support improvements in road safety as a result of a reduced number of accidents;
- To support regeneration, economic growth and development in Leicestershire, in line with the targets set out in the Strategic Economic Plan; and
- To support improved quality of life in Leicester, contributing to its continued development as an attractive place to live, work and visit.

2.7 Phase 2: The Original Preferred Scheme

2.7.1 The preferred scheme option included the following elements:

- Junction improvements at Five Ways, including:
  - Removal of the right turn from the A50 Woodgate to Blackbird Road
  - Removal of the movement from Buckminster Road to Blackbird Road
  - Removal of signals (the stagger) in the middle of the junction
  - Removal of the left turn filter from Fosse Road North to the A50 Groby Road (left turn movement is retained)
  - Reduction of lanes from 4 to 3 on the Blackbird Road approach
  - Reduction in capacity for ahead movements at the A50 Groby Road approach towards the A50 Woodgate

- Junction improvements at Blackbird Road/Anstey Lane/Ravensbridge Drive, including:
    - Introduction of a second right turn lane from Blackbird Road South to Ravensbridge Drive
    - Introduction of a second outbound lane into Anstey Lane
    - Introduction of a third lane on the Ravensbridge Drive approach as a dedicated left turn lane to Blackbird Road south
- Junction improvements at the A6 St Margaret's Way/Ravensbridge Drive, including:
    - An additional lane for ahead and left movements from Ravensbridge Drive to St Margaret's Way on the approach to the junction
    - Raising the level of the carriageway to improve visibility for road users
    - Increasing the radius of curvature of the carriageway to improve the carriageway alignment
    - Conversion of Abbey Gate to one-way northbound operation to divert traffic from the A50 Woodgate to Ravensbridge Drive and the A6
- A reduction in traffic capacity along the A50 Woodgate, achieved through the implementation of changes to signal timings, public realm improvements, the introduction of on-street loading and parking bays and improvements to pedestrian and cycle infrastructure provision, including upgraded crossing facilities.
- Continuous provision of a new shared footway/cycleway on the north side of the A50 Woodgate, which continues on to the east of Abbey Gate. From Abbey Gate, the proposed shared footway/cycleway will continue along National Cycle Network Route 6. The Fiveways junction will also be provided with a three-metre-wide shared footway/cycleway, which will connect with Blackbird Road, the A50 Woodgate and extend into Groby Road.
- Conversion of the Fosse Road North/Stephenson Drive junction from a mini-roundabout to a priority junction, to mitigate against traffic blocking back to the Fosse Road North/A50 junction.
- A supporting package of Smarter Choices initiatives in the Waterside area, including business engagement, business grants, Bike It/Walk It in local schools and communities and other walking initiatives.

2.7.2 Figure 2-7 illustrates the preferred scheme proposals.

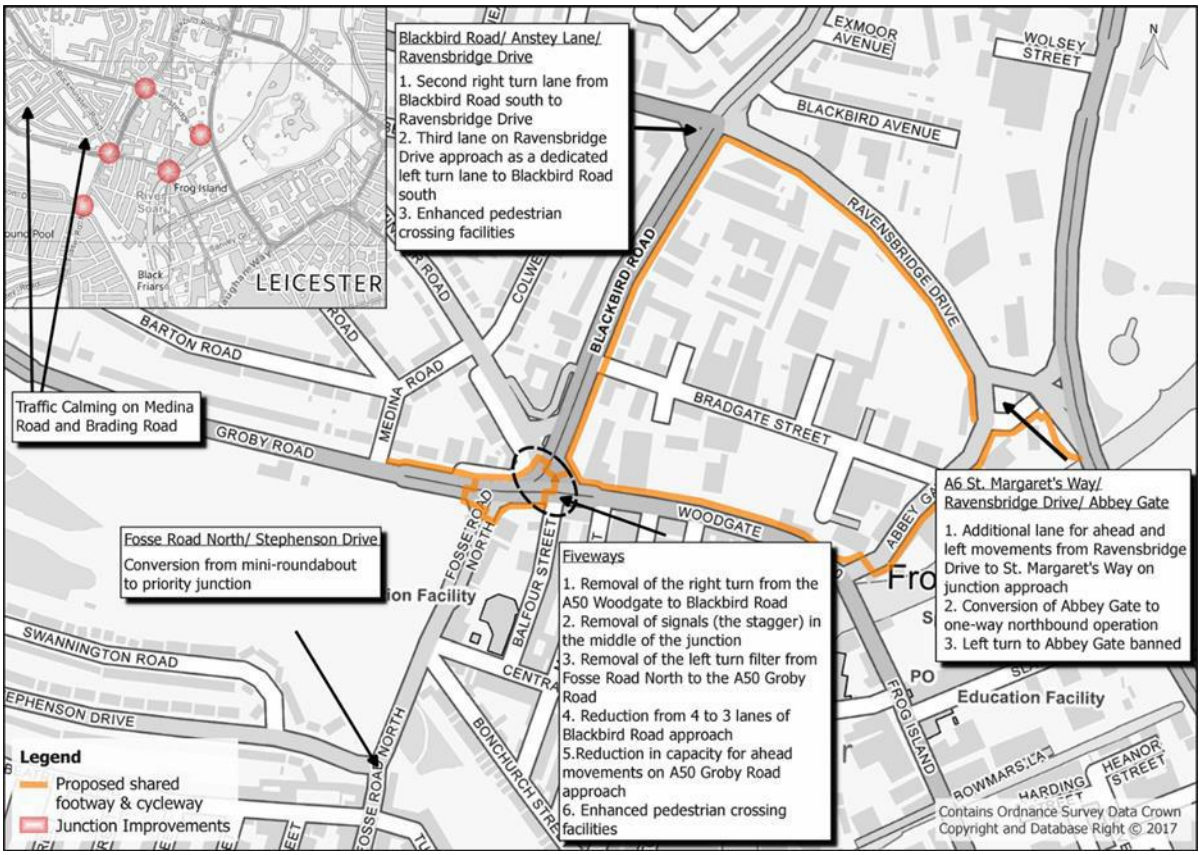


Figure 2-7: Original Preferred Scheme Proposals

Source: Arcadis

2.7.3 The development of the scheme involved detailed modelling using the LLITM transport model. Initial studies[17] had shown that the scheme could produce strategic de-congestion benefits to the Waterside area. However, as the scheme developed, and more comprehensive analysis undertaken, the modelling[18] showed that the scheme was not producing sufficient overall benefits.

2.7.4 These results were not acceptable and provided the LNW Project Board with an opportunity to review the scheme design and take into account changes in local and strategic factors that could impact the scope, design and delivery of phase 2 of the scheme.

2.7.5 This review showed that the operation of the improved five-ways junction was constrained due to the need to keep the scheme on land owned by the City Council. However, It is now expected that additional land will soon become available at the five-ways junction This additional land would allow improved designs to be developed.

[17] Technical Note of notes prepared for LNW Management Meeting 13/4/16. see Appendix D
[18] Leicester North West Phase 2 MSBC, Systra 19 July 2017 LLITM modelling report. see Appendix D

2.7.6 At the junctions of Blackbird Road / Ravensbridge Drive and Ravensbridge Drive / A6 the review showed that the improvements were essentially capacity enhancements that would support increased traffic flow and deliver improvements in safety. The improvements would also directly support the City's strategic highways reclassification exercise (see Appendix C) which would downgrade the existing A50 between Woodgate and the Inner ring road and upgrade Blackbird Road and Ravensbridge Drive to be the A50. The B5327 would be extended from Anstey Lane to the A47 (Humberstone Road) via Blackbird Road, Abbey Park Road and Dysart Way. Improvements at these two junctions should therefore be capable of being delivered earlier than five-ways.

2.7.7 The LNWMTP Project Board reviewed the outcomes from the modelling and proposed two options for proceeding. The first option was to continue with the programme and submit a business case to the LTB that would not be able to demonstrate that the scheme met its design objectives. The second option was to split the development of phase 2 into two stages. The first stage would deliver the more straight-forward elements of phase 2 whilst addition work would be undertaken to develop a stage 2 scheme.

2.7.8 As a Consequence, it was proposed in December 2017 to restructure the programme into two stages:

2.7.9 The first stage would take the improvements developed for the Ravensbridge drive/Blackbird Road junction and the Ravensbridge Drive /A6 junction and deliver them as a first stage that would, in conjunction with Network management signal control, deliver scheme agnostic increases in network capacity whilst increasing junction reliability and safety. This would meet some of the LNW phase 2 objectives and would deliver improved infrastructure that would support a future stage 2 scheme.

2.7.10 The stage 2 scheme would involve looking at the feasibility of obtaining additional Highways land at five-ways in order to deliver and design a more robust scheme at this junction.

2.7.11 This business case is concerned with the Phase 2 (stage 1) scheme.

2.8 Phase 2 (Stage 1) objectives

2.8.1 As a Consequence, the objectives have been revised in order to reflect the delivery of the phase 2 (stage 1) scheme that is designed to support the improvements on Anstey Lane and the desire to alter the road classifications and act as an enabler for a stage 2 scheme that would aim to fulfil the original prime objectives.

2.8.2 The revised primary objectives are set out below:

- To improve the resilience, reliability and capacity of the Blackbird Road/Ravensbridge Drive and Ravensbridge Drive/A6 junctions in order to support the upgrade of Anstey lane as well as supporting increases in orbital movements;
- To achieve an increase in the level of walking, cycling and public transport trips along Ravensbridge Drive and in the wider Waterside area, over and above any background increase in trips as a result of new development;
- To support improvements in road safety as a result of a reduced number of accidents and

- To facilitate future improvements to the Fiveways junction

2.8.3 The secondary objectives remain as follows:

- To contribute towards improved levels of health and wellbeing amongst residents of Waterside and the wider city centre as a result of an increase in physical activity;
- To reduce carbon emissions and contribute towards an improvement in air quality and a reduction in noise levels along the A50 Woodgate;
- To support improvements in road safety as a result of a reduced number of accidents;
- To support regeneration, economic growth and development in Leicestershire, in line with the targets set out in the Strategic Economic Plan; and
- To support improved quality of life in Leicester, contributing to its continued development as an attractive place to live, work and visit.

2.9 Phase 2 (Stage 1): The preferred scheme

2.9.1 The preferred scheme option includes the following elements (see Appendix A):

- Junction improvements at Blackbird Road/Anstey Lane/Ravensbridge Drive, including:
  - Introduction of a second right turn lane from Blackbird Road South to Ravensbridge Drive
  - Introduction of a second outbound lane into Anstey Lane
  - Introduction of a third lane on the Ravensbridge Drive approach in order to provide a dedicated right turn lane, an ahead lane and an ahead & left lane.
- Junction improvements at the A6 St Margaret's Way/Ravensbridge Drive, including:
  - An additional lane for ahead and left movements from Ravensbridge Drive to St Margaret's Way on the approach to the junction
  - Raising the level of the carriageway to improve visibility for road users
  - Increasing the radius of curvature of the carriageway to improve the carriageway alignment
- Providing a shared walk/cycle path along Ravensbridge Drive

2.9.2 Junction designs are constrained by the limited space available in each location.

2.10 Smarter Choices (Access Fund) interventions

2.10.1 Leicester City has been actively engaged in Smarter Choices initiatives that are aimed to encourage changes in travel behaviour. Locally this includes working with Slater Street Primary School, schools on Anstey Lane on their Bike-it and Walk-it initiative and working with the management company at the Highcross Shopping Centre. As well as these targeted initiatives Leicester City Council is funding other activities which encourage the take-up of active travel such as Instructor led Rides in Abbey Park, Choose How you Move and Ride Leicester. The importance of the smarter choices activities is that is boosts the benefits that might be expected just from the delivery of new infrastructure. Due to the intensive interventions already in place it will not be necessary for the LNW project to fund any additional smarter choices measures.

2.11 Scheme Impacts

2.11.1 For Phase2 (Stage 1) the strategic highways impacts are expected to be relatively minor, with the primary objective being to locally increase junction safety, reliability and capacity and to facilitate the delivery of a stage 2 scheme that is in the process of being developed.

2.11.2 Benefits to walkers and cyclists are anticipated due to the delivery of improved crossings at the junctions and a shared off-road cycle and footpath along Ravensbridge Drive.

2.11.3 An accident analysis was undertaken at the two junctions (Appendix D), with the results incorporated into the design specification.

2.11.4 At the Anstey Lane / Ravensbridge Drive junction there have been 14 slight incidents in the period 2011 to 2016 with 22 personal injuries. The most common accident occurred between drivers undertaking right turn movements from Anstey Lane or Ravensbridge Drive after dark. Here the drivers must wait for opposing straight-on traffic to clear the crossing before turning right. The opposing right turners sit facing each other in marked areas. The lines in these marked areas have become faded and it is not clear (particularly at night) where drivers should wait leading to minor collisions. As part of the scheme the lines will be remarked to clearly indicate the right-turn movements.

2.11.5 At the Ravensbridge Drive / A6 junction there have been 11 slight accidents (with 12 personal injuries) and 1 fatal accident. These accidents primarily occurred in daylight at the junction with Abbey Gate. There is a trough in the road between the A6 and the Abbey Gate junction which reduces visibility. In addition, the junction is marked as a priority junction with the Abbey Gate arm forming the minor arm. However due to the alignment of Ravensbridge Drive (being on a bend) the junction is often treated by vehicles as a mini-roundabout. Reduced visibility and driver confusion over who has priority is likely to be a cause of accidents at the location. As part of the scheme Ravensbridge Drive will be realigned to make its junction with Abbey Gate a clearer priority junction. Vehicles exiting Abbey Gate will be required to wait for Ravensbridge Drive to be clear

2.11.6 The junction modelling tool LinSig 3 was used to assess the performance of the two junctions. The primary objective of the assessment was to demonstrate that the improvements would add capacity to the junctions, particularly for accommodating additional traffic between Ravensbridge Drive and Blackbird Road in order to facilitate the potential for diverting traffic from Woodgate, or accommodating additional orbital movements in a stage 2 scheme. The additional junction and vehicle storage capacity that is incorporated into the design increases the flexibility with which the Area Traffic Control (ATC) team can optimise and operate the junctions.

2.11.7 The LLITM model was used to estimate the increase in traffic between 2016 and 2026 which showed a 10% increase in traffic demand at these junctions. Manual reassignment was used to incorporate the proposed ‘design’ flows for the junctions. At the Blackbird road / Anstey Lane junction this resulted in a 17% increase in movements (predominantly between the Blackbird Road (south) arm and the Ravensbridge Drive arms), whilst the Ravensbridge drive showed a 17% to 20% increase.

2.11.8 Four traffic flow scenarios were tested (see Appendix E)

2.11.9 using the existing highways layout and the preferred option design for each junction:

- Scenario 1: 2016 Observed - Observed flows
- Scenario 2: 2016 modified - Observed flows with manual reassignment of traffic routing between the five-ways junction and the A6
- Scenario 3: 2026 - calculated from the scenario 1 flows increased by 10% as estimated by the LLITM model.
- Scenario 4: 2026 modified – calculated from scenario 2 flows increased by 10% as estimated by the LLITM model.

2.11.10 The results are summarised in Table 2-3 and Table 2-4 which show the modelled practical reserve capacity and the potential delay through the two junctions.

2.11.11 The results highlight that:

- Both junctions are operating close to, or above capacity in 2016
- With an unmodified pattern of movements, the improved designs provide for increased performance in both 2016 and 2026. The greatest benefit is for the PM Peak
- The existing designs could not accommodate a modification to the traffic flow to increase traffic flowing in both directions between the Blackbird Road (South) and Ravensbridge Drive. A Practical Reserve Capacity (PRC) of over -40% is forecast at the Anstey Lane/Ravensbridge Drive junction with 2016 traffic flows
- The improved designs provide for considerably greater performance in 2016 and 2026 with the modified patterns of traffic.

2.11.12 These results demonstrate that the junctions are in a highly congested part of the highways network, and that the modifications have increased the capacity that can be accommodated through the junction.

Table 2-3: Blackbird Road / Anstey Lane / Ravensbridge Drive

Traffic Growth Scenarios		TOTAL Flow (pcu)		PRC (%)			Delay (pcu-hr)		
		Flow	compared to 2016	Existing Layout	With Scheme	Difference	Existing Layout	With Scheme	Difference
2016 flows	AM	3,267	0%	-3.7	-1.2	2.5	48	46	-2
(observed)	PM	3,408	0%	-12.2	1.5	13.7	81	44	-37
2016	AM	3,822	17%	-42.5	-9.7	32.8	281	74	-207
(modified)	PM	3,993	17%	-65.5	-20	45.5	500	17	-483
2026	AM	3,594	10%	-15.7	-14.3	1.4	105	100	-6
(Obs scaled)	PM	3,749	10%	-25.9	-2.6	23.3	200	60	-139
2026	AM	4,204	29%	-53.3	-22.4	30.9	455	179	-276
(modified and scaled)	PM	4,392	29%	-85.6	-31.9	53.7	681	298	-382

""

Table 2-4: Ravensbridge Drive / A6

Traffic Growth Scenarios		TOTAL Flow (pcu)		PRC (%)			Delay (pcu-hr)		
		Flow	compared to 2016	Existing Layout	With Scheme	Difference	Existing Layout	With Scheme	Difference
2016 flows	AM	2,793	0%	4	45.4	41.4	20	13	-8
(observed)	PM	3,360	0%	2.7	17.9	15.2	26	15	-11
2016	AM	3,348	20%	-9.4	25.8	35.2	55	16	-39
(modified)	PM	3,945	17%	-10	-0.1	9.9	59	22	-37
2026	AM	3,072	10%	1.8	18.4	16.6	31	16	-15
(Obs scaled)	PM	3,696	10%	-5.6	10.4	16	39	22	-17
2026	AM	3,683	32%	-16.8	-6.1	10.7	110	40	-70
(modified and scaled)	PM	4,340	29%	-19.5	-13.4	6.1	164	90	-74

2.11.13 The scheme incorporates Walking and Cycling improvements at the junctions as well as providing a shared cycle/pedestrian path alongside Ravensbridge Drive. This path provides an important link between Anstey Lane and the River Soar and cycle routes into Waterside and into the City. As well as the regeneration within Waterside there are a large number of businesses located off Ravensbridge Drive and three schools on Anstey Lane. (see Appendix B). Details of the impact are described in section 3.4

2.11.14 A strategic highways assessment of the improvements to the two junctions was undertaken using the LLITM model (Appendix E). The junction improvements represent relatively minor changes to the highways network within the strategic model. In addition, no changes were made that would have led to traffic being re-directed away from Woodgate, and so the model was effectively modelling the equivalent to the LinSig junction modelling of scenario 3.

2.11.15 From the outset it was recognised that undertaking a strategic assessment would only be able to provide limited insight, and a decision was made not to attempt to calculate quantative (monetised) economic benefits using the model due to the limitations in the assumptions.

2.11.16 A key requirement, however, was to demonstrate that the scheme would have an influence over a small geographic area. In order to demonstrate this, an Area of Influence (AOI) plot was obtained showing those links with a flow difference of +/- 5% between a 2031 Do Minimum and the Do Something scenario.

2.11.17 This is shown in Figure 2-8 and demonstrates that the AOI is within the Leicester City boundary extending to the A563 in the North West and the A6 in the East.

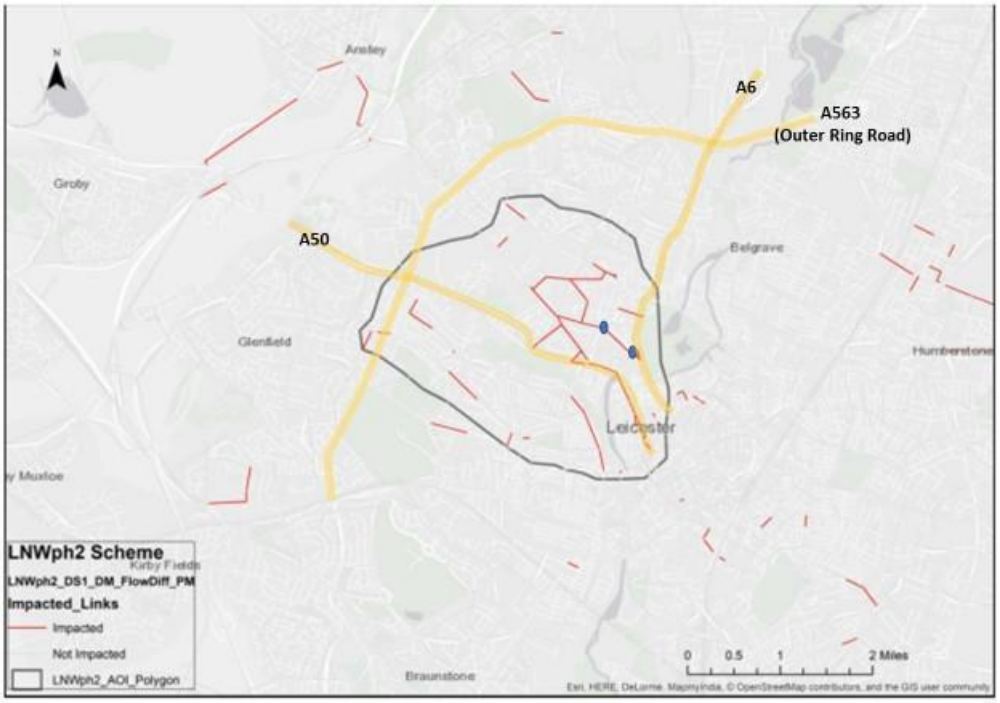


Figure 2-8: Scheme Area of Influence

2.11.18 Summary statistics for the Area of influence are shown below in Table 2-5. This shows the results for the 2031 Do Minimum (DM) and 2031 Do Something (DS1) scenario that within this area there are no material changes in Total Travel Time, Travel Distance and Average speed which are all below 2%.

Table 2-5: Statistics for the Area of Influence

Table 4.1: Summary of the LNWph2 Scenario 1 AOI Statistics – AM Peak

AM	2031 DM	2031 DS1	Diff (DS1- DM)	Diff %
Over-capacity queues (pcu. Hrs)	47	68	21	43%
Total Travel time (pcu. Hrs)	1,657	1,675	18	1%
Total Travel Distance (pcu. Kms)	36,980	36,758	-222	-1%
Average Speed (kph)	22	22	-0.4	-2%

Table 4.2: Summary of the LNWph2 Scenario 1 AOI Statistics – PM Peak

PM	2031 DM	2031 DS1	Diff (DS1- DM)	Diff %
Over-capacity queues (pcu. Hrs)	55	56	2	3%
Total Travel time (pcu. Hrs)	1,741	1,745	4	0%
Total Travel Distance (pcu. Kms)	37,552	37,460	-92	0%
Average Speed (kph)	22	22	0	0%

2.11.19 The results for the AM Peak do note a change in over-capacity[19] queues. The modelling report states: *'As the other variables are not experiencing any significant change, this suggests that the high change in over capacity queues is due to an increase in actual flows between the DM and DS1 scenario, especially along Anstey Lane'*

2.11.20 Inspection of the Anstey Lane /Blackbird Road/Ravensbridge Drive junction does indeed show that delays have increased considerably in the Do Something scenario primarily related to an increase in right turn movements from Ravensbridge Drive onto Blackbird Road blocking the traffic from Anstey Lane.

2.11.21 This is not a movement that would be encouraged by Area Traffic Control and the SCOOT software, and as such this result provides useful insight into the potential operation of the junction. The result highlights that with the improvements to the junction there are potential alternative ways to optimise the network performance which may have unintended consequences. The signal controls will provide ATC with the control necessary to maintain network operation.

[19] These are queues at traffic signals that do not clear at the next green phase

2.12 Summary

2.12.1 This section has set out the strategic case for the Leicester North West Phase 2 project, the rationale for splitting this into 2 stages, and the delivery of the first stage.

2.12.2 The Objectives of the first stage are:

- To improve the resilience, reliability and capacity to the Blackbird Road/Ravensbridge Drive and Ravensbridge Drive/A6 junctions in order to support the upgrade of Anstey lane as well as supporting increases in orbital movements:
- To achieve an increase in the level of walking, cycling and public transport trips along Ravensbridge Drive and in the wider Waterside area, over and above any background increase in trips as a result of new development;
- To support improvements in road safety as a result of a reduced number of accidents and
- To facilitate future improvements to the Fiveways junction

2.12.3 The preferred scheme provides for increased junction capacity at the Anstey Lane / Blackbird Road and Ravensbridge Drive / A6 Junctions and also for improved walking and cycling facilities along Ravensbridge drive and the junctions at either end.

2.12.4 LinSig modelling has demonstrated the ability of the new designs to increase capacity, not only for existing flows, but also for increased flows representing the future-proofing ability to accommodate increased orbital movements in both directions between Ravensbridge Drive and Blackbird Road. Even with the junction improvements it should be noted that in this congested area of the network the junctions are still likely to operate in excess of their design capacity.

2.12.5 The strategic modelling has identified an Area of Influence which is within the Leicester City Council boundary and which shows that there are likely to be only small changes to the highways network performance

2.12.6 The additional junction and vehicle storage capacity that is incorporated into the design increases the flexibility with which the Area Traffic Control (ATC) team can optimise and operate the junctions

2.12.7 Walking and Cycling facilities will be enhanced through a new shared cycle and footway.

2.12.8 The improvements at Ravensbridge drive will lead to improvements in visibility and greater certainty of driver priorities when navigating the junction leading to improved safety.

3 Economic Case

Does the scheme represent Value for Money?

3.1 A proportionate approach to appraisal

3.1.1 WebTAG requires that the economic assessment should be proportionate to the scale and likely influence of the scheme.

3.1.2 In addition the LLTB Assurance Framework sets out a number of requirements which are summarised in Table 3-1, together with details of how the appraisal of LNW Phase 2 (stage 1) addresses each item.

Table 3-1: Statements regarding VfM[20] from the LLTB Assurance Framework

Para	Requirement	LNW phase 2 (stage 1)
Para 59	Proportionate use of WebTAG	The appraisal uses a WebTAG approach that provides a qualitative measure of the benefits for the highways aspects which are primarily related to improved safety and improved reliability. The improvements to the walking and cycling infrastructure is appraised using WebTAG A5.1 (Active Mode Appraisal) and WebTAG A5.4 (Marginal External Costs)
Para 61	The business case should conform that : • Scheme fits with LLTB priorities	• Yes. This as described in section 2
	• The figures used to forecast growth, travellers etc are appropriate	• Data sets used for evidence have been referenced through out the document and consist of both local and national datasets.
	• The scheme appraisal complies with WebTAG (including suitability of model)	• A monetised appraisal has been undertaken using WebTAG A5.1 (December 2017) and WebTAG A5.4
	• Factors used to show benefits and disbenefits are appropriate, proportionate and reasonable	• The highways benefits are assumed to be neutral, and only the walking and cycling benefits have been monetised.
	• The combined package of measures proposed is likely to results in the claimed outputs and outcomes.	• The strategic case set out the expected outcomes to the highways network. The walking and cycling benefits rely on both the hard interventions and the Smarter

[20] Value For Money

		Choices activities that are being undertaken in Leicester and in particular in the vicinity of the scheme.
Para 65	Produce a Value for Money Statement	This statement will be a qualitative description together with a monetised component for the walking/cycling component
Para 66	where appropriate produce a BCR	A BCR has been produced. However it should be noted that this is only a partial result as highways benefits have not been quantified.
Para 67	Scheme with a BCR <1 will not normally be funded	This scheme is an enabler to a stage 2 scheme that is in development. The BCR related to this scheme represents the monetised benefits of the walking and cycling improvements only.
Para 73	The LLTB may approve schemes that offer less than high VfM due to perceived non-monetised wider economic benefits, positive environmental and/or social impacts. It may also take into account important local community requirements, local priorities and sensitivities and links to other non-transport initiatives and projects, particularly where LLTB funding could make a real difference to the deliverability of an important local project.	The Phase 2 (stage 1) scheme supports the LLEP and Mayoral objectives to support development at the Waterside as well as providing for the first stage in a scheme to deliver improvements at the Fiveways junction and along the A50 between Fiveways and the inner ring road.

3.2 Headline Conclusions of the Appraisal

3.2.1 The Present Value Costs (PVC) of the LNWMTP Phase 2 (part 1) scheme is estimated as £3.980M in 2010 prices. The scheme costs include a 20% contingency until final prices are confirmed, and an additional 15% optimism bias is included in the appraisal analysis.

3.2.2 The highways improvements are designed to improve safety, reliability and capacity at the two junctions, and to facilitate a greater volume of flow in both directions between Blackbird Road and Ravensbridge Drive. As this Phase 2 (Stage 1) scheme is designed as an enabler for future work in Phase 2 (stage 2), the highways element is not anticipated to provide significant highways benefits on its own.

3.2.3 In this appraisal the Highways benefits are assumed to be neutral except for reliability and safety which are to be estimated to be slightly beneficial. Other highways benefits are appraised as neutral. In this proportionate business case the highways benefits have not been monetised.

3.2.4 The improvements to the walking and cycling infrastructure, however, are expected to be significant and have been estimated to produce £3.060M of benefits in 2010 Prices (Present Value Benefits -PVB).

3.2.5 Taking into account only the monetised benefits of walking and cycling the BCR of the scheme is estimated at 0.77 which is classified as poor. If the additional 15% optimism bias is removed and only the 20% contingency costs are included then the BCR rises to 0.88.

3.3 Benefits to Highways

3.3.1 As discussed previously the LNW phase 2 (part 1) is primarily expected to provide neutral highways benefits. Area Traffic Control already operate the junctions in conjunction with SCOOT[21] which allows the local network to be optimised based upon local traffic conditions. The improvements to the highways layout will provide additional capacity and flexibility, if required, however if necessary they would be able to revert to operating the junctions as today.

3.3.2 The safety and accident statistics of the junctions have been assessed and are reported in section 2.11. Both junctions are expected to provide a slightly positive benefit

3.3.3 The benefits of these improvements have not been monetised.

3.4 Benefits for Walking/Cycling

Methodology

3.4.1 A separate appraisal was carried out to assess the benefits associated with the proposed improvements for walkers and cyclists. These measures comprise of a shared footway/cycleway along Ravensbridge Drive linking to improved crossing points at both the Blackbird Road junction and the Abbey Gate/A6 junction. The proposed shared footway/cycleway will provide access to National Cycle Network Route 6 which runs alongside the River Soar at Abbey Park.

[21] Split Cycle Offset Optimisation Technique. A method that allows groups of traffic signals to be operated together to optimise traffic flow

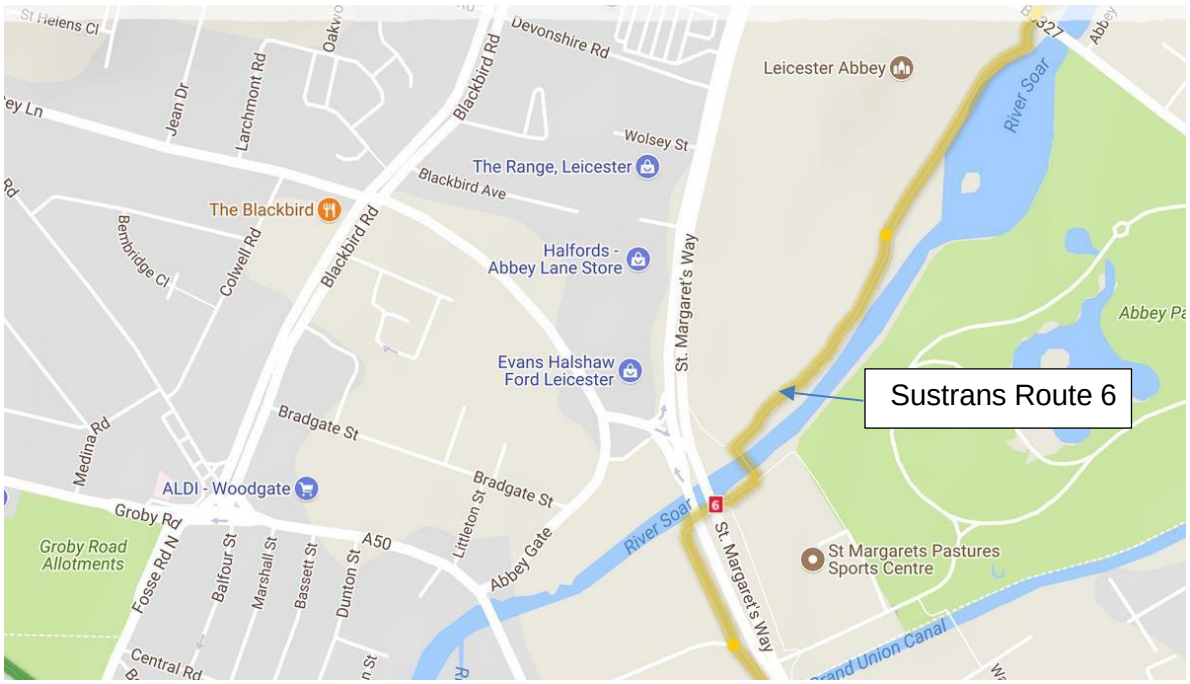


Figure 3-1: Sustrans Route 6 (source Sustrans website)

3.4.2 In addition to the physical improvements Leicester City has been actively engaged in Smarter Choices initiatives that are aimed to encourage changes in travel behaviour. Locally this includes working with Slater Street Primary School, Schools on Anstey Lane on their Bike-it and Walk-it initiative, and working with the management company at the Highcross Shopping Centre. As well as these targeted initiatives Leicester City Council is funding activities which encourage the take-up of active travel such as Instructor led Rides in Abbey Park, Choose How you Move and Ride Leicester. The importance of the smarter choices activities is that is enhances the benefits that might be expected just from the delivery of new infrastructure. The LNW project is not providing any additional funding to these initiatives.

3.4.3 The approach adopted to undertake the appraisal is based on guidance provided by the Department for Transport (DfT) in WebTAG Unit A5.1 Active Mode Appraisal (December 2017) which incorporates the use of WebTAG Unit A5.4 Marginal External Costs (July 2017) and incorporated within the Department for Transport's Active Mode Appraisal Toolkit (updated April 2018).

Scheme Assumptions

3.4.4 It is assumed that the improvements consist of a new 400m segregated off-road shared cycle and foot path along Ravenesbridge Drive with improved crossing facilities at both ends. The highways already has streetlighting, and the new infrastructure would include level kerb crossings and an 'even' pavement.

Core Assumptions

3.4.5 The core assumptions used in the appraisal are as follows:

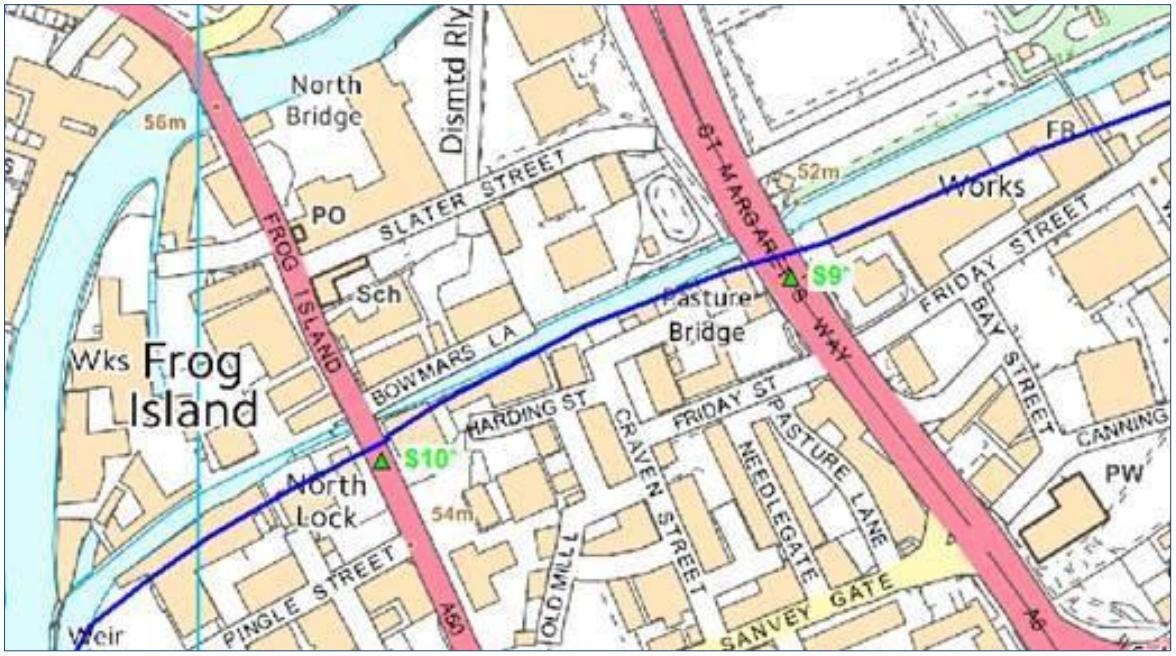
- the area type was selected as 'inner and outer conurbations' to reflect the location of the scheme area

- Opening year – the scheme opening year is assumed to be 2018, in line with the opening year for the other scheme elements.
- Appraisal period – a 20-year appraisal period has been used, to reflect the uncertainties around the longevity of the impacts of walking and cycling schemes compared to the 60-year appraisal period used for large-scale infrastructure projects.
- Decay rate – The default value within the AMAT of 0% has been used, as this is an infrastructure investment. Usage is unlieky to decay as Ravensbridge Drive is an important atrial route linking the City and Waterside with the North of Leicester.
- Optimism bias – optimism bias of 15% was applied.
- Level of background growth – The National Travel Survey default values used within the AMAT have been used
- Return journeys - the share of pedestrian and cycle journeys that are considered to form part of a return trip using the same route is assumed to be 90%. This assumption has been applied to avoid double counting when calculating the number of individuals affected by the intervention, as set out in WebTAG Unit A5.1.
- Days per year - the number of days per year to which the anticipated walking and cycling usage figures were applied was set at 220 days, to reflect the number of weekdays and and absences in the year.
- Walk/cycle speed & distance – The default values obtained from the National Travel Survey were used.

Demand Forecasting

3.4.6 The existing number of walking and cycling journeys was derived from a Manual Classified Count (MCC) undertaken by Leicester City Council at Frog Island between Bowmars Lane and Pingle Street, illustrated as S10 in Figure 3-2. The data was available for one day in September 2016. No other appropriate existing pedestrian and cycle count data was available for the Phase 2 scheme area. Based on this data, the existing number of walking journeys per day in the scheme area is 1,282 and the existing number of cycling journeys per day is 279. This is likely to represent an under-estimation of the existing trips in the scheme area, which supports the robustness of the appraisal.

Figure 3-2 Manual Classified Count Survey Location



3.4.7 A Local Sustainable Transport Fund (LSTF1) monitoring report produced by Leicester City Council[22] was used to calculate the number of people who would switch to walking and cycling as a result of the proposed interventions. The report shows that the interventions led to an increase of 15.7%-37.0% for cycling and 34.2%-54.0% for walking.

3.4.8 Based on a modest interpretation of these results, an uplift of 25% was assumed for cycling and 44% was assumed for walking, as a result of Phase 2 scheme implementation.

The Summary of Benefits

3.4.9 The appraisal outputs and the Active Mode Appraisal Toolkit spreadsheet are contained within Appendix F.

3.4.10 The Analysis of Monetised Costs and Benefits (AMCB) is shown in Table 3-2. The Government costs refer to the costs of the total scheme and include a 15% optimism bias.

[22] Local Sustainable Transport Fund 1 Monitoring Report, Leicester City Council, 4 November 2015

Table 3-2 AMCB

Analysis of Monetised Costs and Benefits (in £'000s)

Congestion benefit	120.83
Infrastructure	0.40
Accident	11.98
Local Air Quality	0.08
Noise	0.80
Greenhouse Gases	2.55
Reduced risk of premature death	1926.71
Absenteeism	668.24
Journey Ambience	339.38

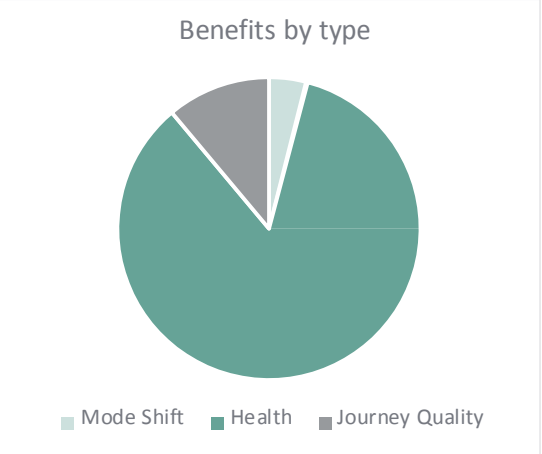
Indirect Taxation	-10.64
Government costs	3980.80
Private contribution	0.00

PVB	3059.94
PVC	3980.40

BCR	**0.77**

Benefits by type:

Mode Shift	126.00	4.1%
Health	2594.96	84.8%
Journey Quality	339.38	11.1%



3.4.11 Health benefits make up nearly 85% of the benefits.

3.4.12 **Sensitivity Test**

3.4.13 The length of time for which benefits can be claimed before reinvestment is required as well as the rate at which the benefits of the scheme decay are difficult to estimate.

3.4.14 As this is primarily an infrastructure scheme the benefits are likely to continue for many years before additional investment is needed. A highways infrastructure scheme will usually apply a 60 years appraisal window. A figure of 20 years has been used for this analysis with a sensitivity test assuming the benefits extend to 30 years before further investment is required.

3.4.15 Evidence is sparse on the likely long term benefits of schemes related to walking and cycling. As this is an infrastructure scheme the benefits are likely to be long lasting before they decay and therefore the default 0% decay rate has been used, the sensitivity test assumes that benefits decay at 10% a year.

3.4.16 This is shown in Table 3-3

Table 3-3: BCR as decay rate or Length of Appraisal are varied

BCR		Decay Rate	
		0%	10%
Length of Appraisal (Years)	20	0.77	0.35
	30	1.09	0.40

3.5 Appraisal Summary Table (AST)

3.5.1 The AST can be found in Appendix G

4 Financial Case

What does it cost, and who is paying, also the risk to different parts of the contributions not being provided?

4.1 Overview

4.1.1 This section sets out the scheme costs that have been developed for Leicester North West Phase 2, and the assumptions upon which they are based. A profile and breakdown of scheme costs by year is provided, with an explanation of how the base costs have been adjusted risk and uncertainty. A description of the funding arrangements for Phase 2 and the wider Leicester North West scheme is also provided, alongside an assessment of the overall affordability of the scheme.

4.2 Approach, Methodology and Assumptions

4.2.1 Leicester City Council developed the Phase 2 (stage 1) scheme cost estimates based on its experience of the delivery of previous similar schemes and the output costs incurred. Allowances of 20% for traffic management and 10% for preliminaries were added to the estimated construction cost, and a further 10% allowance for fees and a 20% contingency was added to the combined cost of construction, traffic management and preliminaries.

4.2.2 Although not yet finalised, a Quantified Risk Assessment is being progressed through ECI to adjust the baseline cost estimate for calculated risks associated with scheme development and delivery. However, the 20% contingency is considered to be suitably robust to account for the impact of any risks on the scheme costs at this stage.

4.2.3 The scheme costs are based on the assumption that on-site works will start in July 2018, with the completion of construction and scheme opening in early 2019.

4.3 Scheme Costs

4.3.1 Table 4-1 presents a summary of the scheme costs for the Phase 2 (stage1) scheme. As stated in Section 4.2, these figures include a 20% allowance for contingencies. Note that the figures in the column totals may not sum exactly to match the total figures due to rounding. At this stage, operating and maintenance costs have not been developed.

4.3.2 The majority of the costs presented in Table 4-1 relate to capital costs for scheme construction. There are no land costs associated with the preferred Phase 2 (stage 1) scheme.

Table 4-1 Summary of Phase 2 (stage 1) Scheme Costs (£ Million)

Phase 2 (stage 1)	Historic	Spend			Total
	2016/17	2017/18	2018/19	2019/20	
Works	0.00	0.00	3.68	0.00	3.68
Fees	0.03	0.35	0.27	0.00	0.65
Total	**0.03**	**0.35**	**3.95**	**0.00**	**4.33**

4.4 Funding Arrangements

4.4.1 Table 4-2 illustrates the funding arrangements that have been put in place for Phases 1, 2 and 3 of Leicester North West. The total value of the external funding is £16.4 million, which is comprised of £16.2 million from the Local Growth Fund and £0.2 million Growing Places grant funding which was received in 2014/15 to support scheme preparation and Business Case development.

4.4.2 A total of £2.9 million in match funding is jointly being provided by Leicester City Council and Leicestershire County Council. Leicester City Council also contributed £0.34 funding towards maintenance as part of Phase 1. The match funding is being drawn from existing capital funding, including Integrated Transport Block (ITB) funding.

Table 4-2 Leicester North West Funding Arrangements: Phases 1, 2 and 3 (£ Million)

Funding Source		2015/16	2016/17	2017/18	2018/19	2019/20	TOTAL
External Funding	Local Growth Fund	6.05	1.85	0.35	3.32	4.63	16.20
	Total	**6.05**	**1.85**	**0.35**	**3.32**	**4.63**	**16.20**
Local Contribution	Leicestershire County Council	0.13	0.50	0.00	0.00	0.77	1.4
	Leicester City Council (Scheme)	0.87	0.00	0.00	0.63	0.00	1.5
	Leicester City Council (Maintenance)	0.34	0.00	0.00	0.00	0.00	0.34
	Total	**1.34**	**0.50**	**0.00**	**0.63**	**0.77**	**3.24**
	Grand Total	**7.39**	**2.35**	**0.35**	**3.95**	**5.40**	**19.44**

4.4.3 Table 4-3 shows the actual and forecast expenditure for Phases 1, 2 and 3.

Table 4-3 Leicester North West Actual and Predicted Expenditure: Phases 1, 2 and 3 (£ Million)

Expenditure		2015 /16	2016 /17	2017 /18	2018 /19	2019 /20	Total
Phase 1	**Total**	**7.39**	**2.31**	**-**	**-**	**-**	**9.70**
Phase 2	Stage 1	-	0.03	0.35	3.95	-	**4.33**
	Stage 2	-	-	-	-	5.40	**5.40**
	Total	**-**	**0.03**	**0.35**	**3.95**	**5.4**	**9.73**
Phase 3	**Total**	**0.00**	**0.01**		**-**	**-**	**0.01**
Grand Total		**7.39**	**2.35**	**0.35**	**3.95**	**5.40**	**19.44**

4.4.4 In accordance with the procedures set out in the LLTB Assurance Framework, the funding provided through the Local Growth Fund can only be spent on the specified scheme for which full approval has been given, and funding can only be used for capital expenditure.

4.4.5 Funding will be released in quarterly instalments after the full approval stage. Payments can be suspended if project spend falls behind funding drawdown. The Section 151 Officer at Leicester City Council holds responsibility for the sign-off of applications for payment.

4.4.6 All scheme promoters in receipt of LLTB funding are required to provide regular quarterly progress reports containing financial and delivery information to the LLTB, including a full outturn cost profile. No funding will be allocated to the scheme promoter until the full business case has been approved by the LLTB. The scheme promoter will be responsible for submitting timely three monthly claims to the LLTB for payment in arrears, on dates specified by the LLTB and in a format to be specified by the LLTB. On receipt of the claim, the LLTB will then instruct the accountable body to release the funds to the scheme promoter.

4.5 Financial Risk

4.5.1 A project risk log has been developed for Phase 2 (stage 1), which identifies financial, design and construction risks that may impact on programme and or costs. This is provided in Appendix I, with supporting commentary on the risk management strategy adopted for Phase 2 (stage 1) in Section 5.8.

4.5.2 The key financial risk that has been identified is issues related to obtaining Business Case sign-off and approval for full funding drawdown from the LLEP/LLTB. This could lead to a reduction in the level of funding that can be accessed for delivery of the Phase 2 works or delays to the delivery programme, or could threaten overall scheme delivery. The programme requires funding to be confirmed and in place well in advance of the planned start date on site, in order to place the Task Order with the contractor.

4.5.3 This risk is in part being managed through the appointment of a consultant to develop the Business Case on behalf of the City Council, and a separate consultant appointed to provide assurance for the Business Case.

4.5.4 There is also the risk that cost overruns during the scheme development and delivery process jeopardise the full delivery of the scheme. However this risk is reduced by the use of Early Contractor Involvement and obtaining a Target Price. Value engineering will also be employed where required, and lessons learnt from previous similar major schemes have been applied to price the works as accurately as possible.

4.5.5 Any cost overruns are reported to the Project Board at monthly meetings, and advance warning will be given of any likely cost overruns at monthly site progress meetings.

4.6 Summary

4.6.1 Scheme cost estimates have been developed for LNWMTP Phase 2 (stage 1) based on Leicester City Council's previous experience of delivering similar major transport schemes. Appropriate allowances have been added to the base construction costs for contingency and fees.

4.6.2 The total scheme cost is £4.33 million. A total local contribution of 17% is being provided by Leicester City Council and Leicestershire County Council for Phases 1, 2 and 3.

4.6.3 The main financial risk to the successful delivery of the Phase 2 (stage 1) programme is the risk that approval for the Business Case is not granted and that full funding drawdown is not fully realised. Assurance has been put in place for the Business Case to ensure that its scope is adequate and proportionate, and that the results presented are technically robust.

5 Management Case

This demonstrates that the programme is deliverable.

5.1.1 This Management Case provides information on the overall deliverability of LNWTP Phase 2 (stage 1), including commentary on:

- The project delivery programme and key milestone dates;
- The project governance structure and reporting and assurance arrangements;
- The risk management strategy;
- The approach taken to stakeholder engagement and communications; and
- The proposed monitoring and evaluation arrangements that will be used to assess the scheme's success in terms of the extent to which the objectives have been reached and whether the level of anticipated benefits have been fully realised.

5.2 Approach

5.2.1 The delivery of LNWMTP Phase 2 (stage 1) will be led by Leicester City Council as the main scheme promoter. LNWMTP Phase 2 (stage 1) forms the second phase in a multi-phase programme, and a similar approach to delivery will be adopted to Phase 1, which was delivered in partnership by Leicestershire County Council and Eurovia Contracting, and which is now fully complete.

5.2.2 A number of lessons were learnt in the delivery process for Phase 1, as identified in a Post Project Review document developed jointly by the Midlands Highways Alliance (MHA), Leicestershire County Council and Eurovia Contracting in November 2016. Inputs were also provided by Leicester City Council as the other responsible highways authority. These lessons have been used to refine the approach taken to delivery for Phase 2 (part 1), as described in Section 5.3.

5.3 Lessons Learnt

5.3.1 Leicester City Council has an excellent track record in delivering large scale highway improvement schemes in accordance with planned budgets and implementation timescales. As part of a culture of continuous improvement, and in line with the requirements set out in the MHA Contract Management Manual, the Council carries out in-depth post project reviews on each major highway project to identify lessons learnt that can be used to shape the successful delivery of future schemes.

5.3.2 The most recent similar project delivered by the City Council was LNWMTP Phase 1, which had a value of £9.70 million and which was delivered between July 2015 and July 2016. The key outputs, which included improvements to two roundabout junctions and one signalised junction, were delivered within the specified timescale and in accordance with the available budget.

5.3.3 The Phase 1 project was produced using the mini competition procedure within the Medium Schemes Framework 2 (MSF2) as part of the MHA. The same approach was used for the delivery of the Phase 2 (stage 1) scheme; further details of which are provided
in Section 6.3

5.3.4 The key lessons learnt were as follows:

- **Benefits of Early Contractor Involvement (ECI)** – fortnightly meetings during the ECI period meant that issues could be identified and addressed at an early stage, and ECI contributed to the success of the traffic management scheme through the appointment of a specialist traffic management subcontractor.
- **Importance of early on-site surveys** – a ground penetrating radar survey was commissioned by Leicester County Council prior to the award, which identified a gas main that needed to be diverted. This could have caused serious delays in the programme had it not been identified at an early stage.
- **Development and agreement of the target price** – the target price was built up using a bill of quantities, which although not the contractually correct method, did simplify the process for assessing and agreeing the price. The target price was agreed in good time prior to contract award and the start date on site; however, there was one item of ambiguity which could have been avoided with improved document control from both parties.
- **Use of management and monitoring procedures –** Conject (an electronic contract management system) was used on the project, which added value through improved financial monitoring, efficiency in cross-team working and auditability.
- **Start date on site** – the start of work was programmed to coincide with school holidays, when traffic flows were forecast to be lighter than usual. A two week advance period was used for early trial holes and compound set up; however a longer period would have been beneficial.
- **Public liaison and community involvement** – the use of a dedicated Public Liaison Officer worked well in terms of addressing community feedback, in addition to drop-in sessions at local community venues and the use of a dedicated 24 hour telephone number and supporting letter drops and leaflet campaigns. In addition, a positive contribution was made back to the local community, including the donation of an external defibrillator to the New Parks Community and the development of a new footpath for the New College.

5.3.5 These lessons learnt will be used to refine the approach taken to the delivery of LNWMTP Phase 2 (part 1). ECI is being used, and a specialist traffic management subcontractor will be appointed in advance of works beginning. On-site surveys have been carried out where required to identify potential issues, rather than relying on drawings which may be incorrect.

5.3.6 Monitoring for Phase 1 has been carried out and the feedback from the local community is that the road network is clearer and that motorists, pedestrians and cyclists are seeing substantial journey improvements.

5.3.7 Table 5-1 provides an overview of another major scheme delivered by Leicester City Council in the last five years and the key lessons learnt that will be applied to the delivery of LNWMTP Phase 2 (stage 1).

Table 5-1 Lessons Learnt and Application to LNWMTP Phase 2

Project Name	Value	Timescale	Key Outputs Delivered	Lessons Learnt
A426 Aylestone Road	£5m	2013-2014	Quality Bus Corridor scheme delivered through the DfT's Better Bus Area Fund (BBAF). Construction overran by 3-4 months and the scheme was delivered over budget.	An incomplete package of drawings was provided to contractors to price, due to short timescales. There were also issues with version control. Tighter procedures need to be employed in future. The project team structure, which included both County and City officers, was difficult to manage at times. This was not aided by staff changes & limited staff resources. Improved contingency plans and reporting arrangements should be put in place in future. Future schemes require better liaison on traffic management plans.

5.4 Governance and Reporting Arrangements

5.4.1 This section describes the governance structure for LNWMTP Phase 2 (stage 1), the lines of accountability and responsibility and the reporting arrangements and approval processes that have been put in place.

5.4.2 Figure 5-1 illustrates the project governance structure and the lines of accountability between the component parts. The membership and responsibilities of the key component parts are described in Table 5-2.

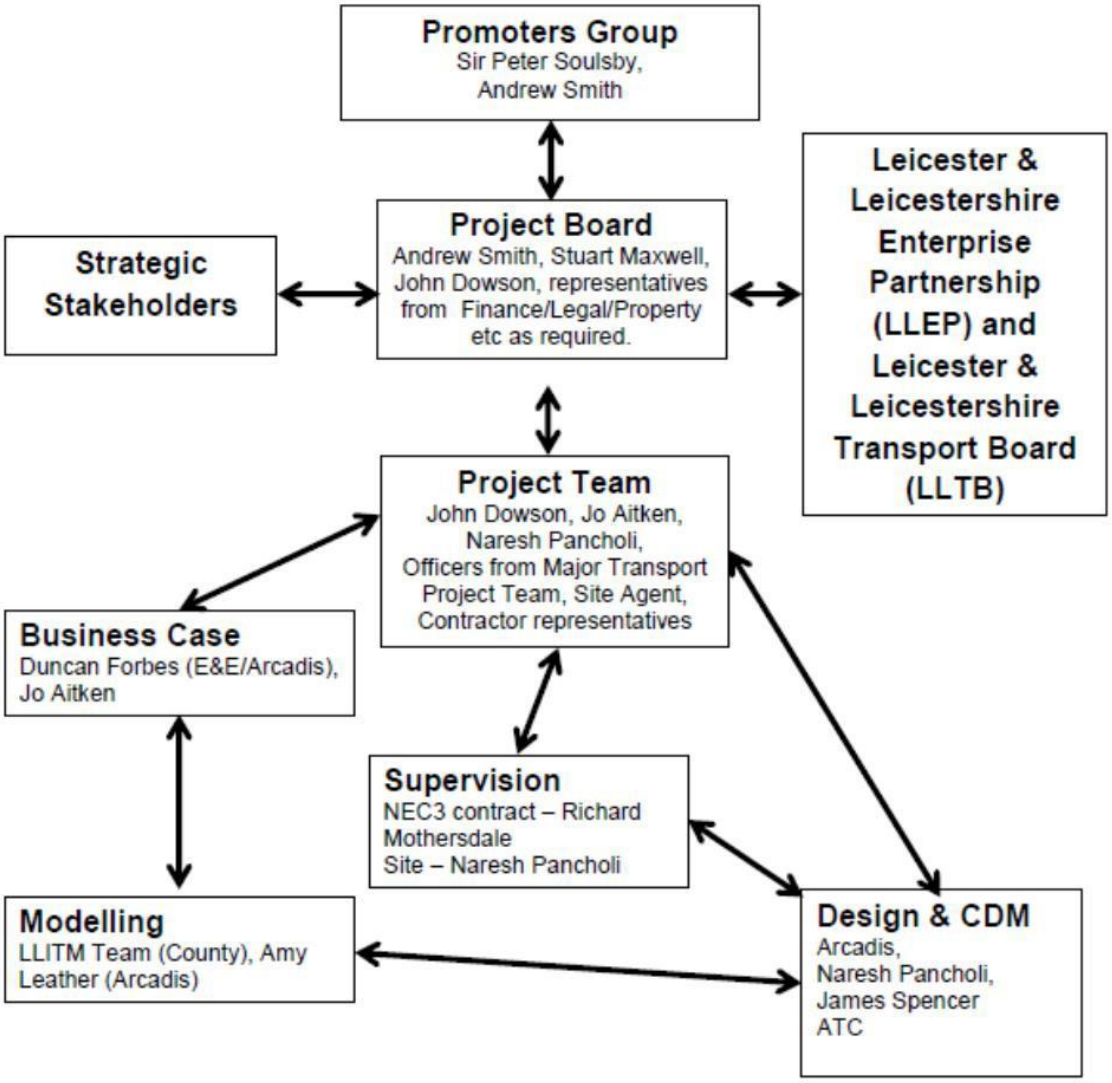


Figure 5-1 LNWMTP Phase 2 (stage 1) Governance Structure

Table 5-2 Governance Structure – Membership and Responsibilities

Group	Membership	Responsibilities
Promoters Group	Sir Peter Soulsby – City Mayor Andrew L Smith – Divisional Director, Planning, Development and Transportation	• Agree a Memorandum of Understanding with respect to project funding • Makes procurement decisions including associated contractual conditions and obligations • Monitors overall project progress • Promotes co-operation between partners and stakeholders • Assists the Project Board in resolving issues that may impact on programme/budget • Agree to any necessitated changes in direction as proposed by the Project Board
Leicester and Leicestershire LEP (LLEP) and Leicester and Leicestershire Transport Board (LLTB)	LLEP – Board is comprised of local authority and private sector members LLTB – a voluntary partnership between Leicester City Council, Leicestershire County Council, and the LLEP	• Promotes the objectives of the LLEP as set out in the SEP • Prioritises transport investments • Assesses and approves major scheme Business Cases for funding • Ensures value for money and sound decision making
Project Board	Andrew L Smith – Divisional Director, Planning, Development and Transportation Stuart Maxwell - Transport Director John Dowson - Major Transport Project Team Leader Representatives from other divisions e.g. finance, legal as required	• Sets the strategic direction and objectives of the project • Finalises and reviews the project delivery plan • Makes key decisions and approves significant changes to the project • Ensures that deliverables are produced to the required standard / sign-off of deliverables • Resolves issues escalated by the Project Team • Provides feedback to the Promoters Group
Project Team	John Dowson - Major Transport Project Team Leader Jo Aitken - Project Manager Naresh Pancholi – Project Manager Other officers from Major Transport Project Team Contractor Representatives Design Consultant Representatives	• Day-to-day responsibility for project delivery, including resourcing, risk management, programming and reporting • Provides reports to the Project Board • Escalates issues to the Project Board as required

5.5 Assurance and Approvals

5.5.1 Assurance and approvals for LNWMTP are as per the processes set out in the LLTB Assurance Framework, which is required to be in place before the DfT can delegate the responsibility for decision making on major transport schemes to the local level.

5.5.2 Parts 1 and 2 of the Assurance Framework set out the process by which major transport schemes such as LNWMTP are identified, developed, sifted and prioritised for approval by the LLTB. These two parts were approved and signed off by the DfT in 2013, and the scheme selection process was subsequently carried out in June and July of that year. Scheme promoters then submitted Strategic Outline Business Cases in 2014 for initial approval.

5.5.3 Part 3 of the Assurance Framework, which relates to 'Programme Management and Investment Decisions', has not been fully endorsed by the DfT, as responsibility for these matters is now fully devolved to the LLTB. However, the Value for Money segment of Part 3 was required to be endorsed by the DfT, which was achieved in 2013.

5.5.4 Part 3 states that schemes with a medium or low Value for Money will not be precluded from being funded if there are other positive non-monetised benefits, for example wider economic, environmental and social/distributional benefits.

5.5.5 A Full Business Case that sets out the results of the economic assessment work, alongside supporting strategic narrative and information on scheme procurement, delivery and financial arrangements, must be submitted and approved by the LLEP before funding approval can be given. Independent assurance is provided by consultants appointed specifically to review Business Case submissions.

5.6 Delivery Programme

5.6.1 The Phase 2 (stage 1) delivery programme is provided in Appendix H, and a summary of the key milestones is provided in Table 5-3 below.

Table 5-3 Key Milestone Dates

Milestone	Date
Early Contractor Involvement	January – June 2018
Public Consultation	April 2017 – May 2017
Business Case Submission to the LLEP/LLTB	May 2018
Final Design Approval	May 2018
Start of Construction	Summer 2018 (subject to Traffic Management coordinating considerations)
Construction Period	Summer 2018 to Summer 2019
Scheme Opening Date to Traffic	September 2019

5.6.2 The target date for the start of construction is Summer 2018, subject to Traffic Management coordinating considerations, with completion forecast for by late Summer 2019. The ability to start work on site in Summer 2018 is dependent on the Business Case being approved by the LLEP in May 2018 and subsequent approval for funding drawdown to commence as well as the construction contract with Tarmac signed by 3rd June 2018 before the end of MHA MSF2.

5.6.3 The on-site works will be phased to minimise disruption to traffic as far as possible. The Ravensbridge Drive/A6 junction improvements will be constructed first with the assistance of a full road closure when Traffic Management allows, so that the road levels can be built up. The Blackbird Road/Anstey Lane junction improvements will with works being phased at each arm of the junction. Resurfacing and the introduction of the shared use footway/cycleway along the length of Ravensbridge Drive will also be incorporated into the programme.

5.6.4 During the preliminary design phase an assessment of land requirements was undertaken, and it was determined that all of the land required for the Phase 2 (stage 1) works lies within the public highway, and that no land acquisition is required. However, the provision of the additional inbound lane on Ravensbridge Drive between Abbey Gate and St Margaret's Way relies upon the use of a strip of land that is within the forecourt of Evans Halshaw Ford car dealership. The land belongs to the City Council, and notice has been given to the site occupiers.

5.6.5 Notification of the works as required by statutory obligations has been sent out to all utility providers.

5.7 Stakeholder and Public Communications and Consultation

5.7.1 A description of the main internal and external stakeholder groups and how they have been engaged and consulted during the scheme development process is provided in Table 5-4.

5.7.2 The main aim of the stakeholder engagement work to date has been to raise awareness of the scheme, its objectives and its anticipated benefits, and to obtain buy-in from key groups who have a level of interest and influence in the scheme, including seeking input from those who will be affected by the scheme.

Table 5-4 Stakeholder Engagement and Communications

Stakeholder	Engagement & Communication
LLEP	Quarterly meetings via the Leicester and Leicestershire Transport Advisors Group (see below). Regular engagement to discuss and agree the scope of the Business Case for Phase 2 and related assessment work.
City Mayor – Sir Peter Soulsby	Regular updates provided via the reporting processes to the Promoters Group.

County Council	Regular, ongoing communication at all levels as joint scheme promoters of LNWMTP. Representation at Project Board meetings.
Leicester and Leicestershire Transport Advisors Group	Quarterly meetings. Group includes representatives from the planning authorities (strategic planning), freight transport and the LLEP
Leicester Access Forum	Quarterly meetings
Leicestershire Access Forum	Quarterly meetings
Bus Operators	Monthly at the 'Improving Bus Services' meetings and on an ad hoc basis with individual bus operators
Bus Users	Quarterly at the Bus User Panel meetings
Leicester Local Taxi Forum	Quarterly at Forum meetings
Local Businesses	Ongoing communications through the Local Business Forum and via individual meetings and workshops as appropriate.
General Public	At critical stages of the project through public consultations, engagement events, press releases and online information

5.7.3 Public consultation was carried out in April/May 2017 (Appendix D). This was in the form of consultation materials that were distributed online via the City Council website and printed copies distributed to affected property owners and local communities. A public exhibition was also held to which members of the public were invited to obtain more information, ask questions and give support for the scheme.

5.8 Risk Management Strategy

5.8.1 A high level risk management strategy for LNWMTP as a whole was included in the Project Initiation Document, that captures programme level risks and mitigation actions. Detailed risk logs are then prepared for each individual phase, which document the project-specific risks.

5.8.2 The Phase 2 risk log is provided in Appendix I. This documents the key funding, design and construction risks and their anticipated probability and impact. An overall pre-mitigation risk score has then been calculated. A risk management strategy has been identified for each risk, which sets out whether each risk is to be avoided, retained or mitigated. Specific actions to reduce the likelihood and potential risk are identified, and a resultant risk score has been calculated.

5.8.3 The risks were identified and informed through experience on the delivery of similar major schemes, including LNWMTP Phase 1. Table 5-5 summarises the key risks and the risk management strategy that has been adopted. The risk ratings are applied from a scale of 1-20, where 20 represents the highest possible risk rating.

Table 5-5 Phase 2 Key Risks

Risk	Initial Risk Rating	Management Strategy	Residual Risk Rating
Scheme cost exceeds budget	16	Proactive project estimating for options. Consider value engineering if necessary.	12
LLEP does not approve the Business Case or grant funding approval to the level required	16	Understand and address wider project objectives when presenting business case to LLEP for funding approval.	12
Stakeholder dissatisfaction – objecting to design proposals	16	Early involvement/discussions and keeping businesses well informed of project and programme.	12
Losing key internal staff/project resource/suppliers	16	Proactive project management/investigate possible existing framework agreement for suppliers	12
Negative impact on the transport network during construction	16	Early discussions and consultation with the Traffic Management Team and other stakeholders	12
Environmental and geographical constraints – issues with CPOs, stopping up orders, land negotiation	16	Early issue of notices to identify any required diversions. Start negotiations with tenants early. Consider underground mapping of existing services.	12
Statutory requirements and processes – delays and design challenges leading to additional costs	16	Early discussion and consultation with all affected service assets, particularly with regard to flood risk.	16

5.8.4 At this stage, a Quantified Risk Assessment (QRA) is in the process of being undertaken in order to adjust the scheme costs in accordance with the likely impact of any key risks that may occur. As detailed in the Financial Case, a contingency amount has been added to the scheme costs which is considered to be sufficient to account for the likely financial impact of any risks that do materialise.

5.8.5 Project risks are reviewed on an ongoing basis through the life of the scheme development and delivery process. This is the responsibility of the Work Package Lead, who maintains the risk log and reports any issues, in particular any risks that lead to cost overruns, to the Project Board at monthly meetings as required.

5.8.6 A separate risk register will be prepared for the construction works in conjunction with the contractor appointed to the ECI process.

5.9 Project Handover and Closedown

5.9.1 Upon completion, the construction contractor will provide the following to Leicester City Council as part of the project closedown and handover process:

- Health and Safety File;
- Method Statements for the works carried out;
- Original and as-built information and drawings;
- List of suppliers and materials used;
- Product data sheets and/or technical specifications for all materials used;
- CCTV footage of drainage;
- Road lighting, signs and traffic signals;
- Operation and Maintenance (O&M) manuals; and
- Test results and records.

5.9.2 Once all of the information has been received to its full satisfaction, Leicester City Council will issue a substantial completion certificate which will trigger the start of the 12 month defects period.

5.10 Monitoring and Evaluation

5.10.1 An outline monitoring and evaluation plan has been put in place to assess the impacts and outcomes of the Phase 2 (stage 1) scheme. This has been developed in accordance with the DfT's Monitoring and Evaluation Framework for Local Authority Major Schemes (September 2012), and with reference to other relevant guidance, including the DfT's Local Sustainable Transport Fund (LSTF) Monitoring and Evaluation Framework (December 2012).

5.10.2 The approach taken to monitoring the Phase 2 (stage 1) scheme focuses on assessing the short to medium outcomes and longer term impacts, as part of a wider monitoring and evaluation exercise for LNWMTP as a whole. This combination of monitoring and evaluating individual phases and the programme as a whole will help to ensure transparent and accountable decision-making and will provide Leicester City Council with robust

evidence with which to identify and develop future phases of LNWMTP and other major schemes going forward.

5.10.3 Monitoring, which involves the collection of data to check progress against the scheme objectives, outputs and outcomes, will be important to provide evidence on the successful implementation of the scheme and its specified outputs, and to ensure that the short to medium term outcomes are in line with the specified objectives.

5.10.4 Evaluation assesses the longer term causal effect of the scheme on the anticipated impacts and benefits, including an assessment of whether the specified value for money has been realised. A combined approach to monitoring and evaluation provides lessons that can be learned for planning future schemes and associated monitoring programmes.

5.10.5 The Phase 2 (stage 1) monitoring activities will focus on the extent to which the scheme has delivered against its primary and secondary objectives, which for clarity are as follows:

Primary objectives:

- To improve the resilience, reliability and capacity of the Blackbird Road/Ravensbridge Drive and Ravensbridge Drive/A6 junctions in order to support the upgrade of Anstey lane as well as supporting increases in orbital movements;
- To achieve an increase in the level of walking, cycling and public transport trips along Ravensbridge Drive and in the wider Waterside area, over and above any background increase in trips as a result of new development;
- To support improvements in road safety as a result of a reduced number of accidents and
- To facilitate future improvements to the Fiveways junction

Secondary Objectives:

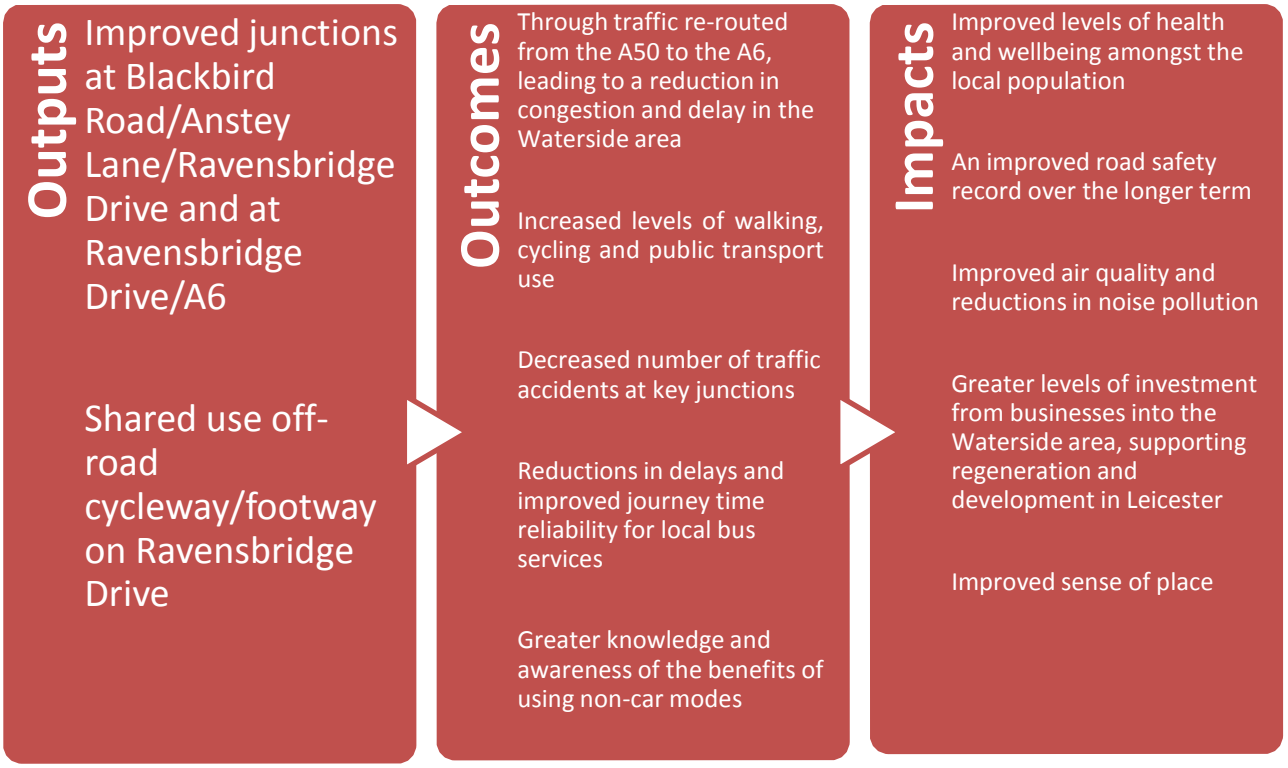
- To contribute towards improved levels of health and wellbeing amongst residents of Waterside and the wider city centre as a result of an increase in physical activity;
- To reduce carbon emissions and contribute towards an improvement in air quality and a reduction in noise levels along the A50 Woodgate;
- To support improvements in road safety as a result of a reduced number of accidents;
- To support regeneration, economic growth and development in Leicestershire, in line with the targets set out in the Strategic Economic Plan; and
- To support improved quality of life in Leicester, contributing to its continued development as an attractive place to live, work and visit.

5.10.6 The extent to which these objectives have been met will be assessed using an outcome-based monitoring approach that examines the ‘before’ and ‘after’ scenarios to determine how the outcomes change between the pre-implementation (baseline) and post-implementation stages. A logic map has been developed which identifies the causal pathways between the scheme outputs, outcomes and impacts, as shown in Figure 5-2.

5.10.7 Outputs are the tangible deliverables of the scheme; for example, the proposed off-road shared use cycleway/footway along Ravensbridge Drive. Outcomes are observable changes in the short to medium term; for example, increased levels of walking and cycling as a response to the introduction of the new infrastructure. Impacts are the longer-term effects on the primary and secondary objectives of the scheme, including wider economic and social objectives; for example, improved access to employment and improved levels

of health and wellbeing amongst the local population, as a result of the increase in physical activity.

Figure 5-2 Phase 2 (Stage 1) Scheme Logic Map



5.10.8 The monitoring and evaluation programme for LNWMTP Phase 2 (stage 1) will primarily make use of quantitative data. A primarily quantitative approach will provide a robust body of evidence with which to evaluate the scheme's success, enable the identification of trends in key indicators over time; for example, journey time reliability, and enable the use of data that is already collected for other purposes; for example, Automatic Traffic Count data. Where available, qualitative data will also be examined to explore attitudes and perceptions in more depth.

5.10.9 Baseline monitoring took place between April and June 2017, prior to the scheduled start of construction in July 2018. The scheme is scheduled to be completed by the end of February 2019. Follow-up monitoring will take place one year and five years after scheme opening. Monitoring data collection activities will be programmed in neutral periods, avoiding school holidays and bank holidays to avoid any distortions in the data.

5.10.10 The initial monitoring and evaluation report, which will be based on data collected one year after scheme opening, will be produced at least one year but less than two years after scheme opening. The final monitoring and evaluation report will be based on data collected one year and five years after scheme opening.

5.10.11 The collection of interim monitoring data a year after scheme opening provides sufficient opportunity for the scheme outcomes to settle and reduces the potential impact of any extraneous factors on the outcomes. The collection of data five years after scheme opening enables longer term analysis of any emerging trends, whilst taking account of any external influences on the data.

5.10.12 Table 5-6 identifies the types of data that will be collected for use in monitoring and evaluating the success of LNWMTP Phase 2 (stage 1). Some of this data is already collected for other purposes, including LTP and Local Sustainable Transport Fund (LSTF) monitoring, which supports a proportionate, cost effective approach.

5.10.13 Traffic data will generally be analysed for the immediate scheme area and any links forecast to experience a +/-5% change in flows as a result of the scheme. The data will be examined to identify changes in flows as a result of the scheme rather than daily fluctuations. The Leicester and Leicestershire Integrated Transport Model (LLITM) will be used in conjunction with traffic count data to identify changes between forecast and actual traffic flows. Wider economic and social data will be examined for North West Leicester and more widely, as appropriate.

Table 5-6 Data Collection Requirements

Data Type	Data Source(s)	Data Collection Frequency	Rationale	Objectives Assessed
Traffic Data: Peak hour, 24 hour and annual traffic flow data (A50 & alternative routes) Journey time data (AM & PM peaks) Average vehicle speeds (AM & PM peaks) Average peak hour delay per mile (minutes) Average bus queue time per mile (minutes) Queue lengths	LLITM Trafficmaster data (bi-directional link speeds) Permanent Automatic Traffic Counts (ATCs) on main orbital and radial routes Manual Classified Counts (MCCs) on key radial routes Queue length surveys at key junctions	Permanent ATCs – continuous MCCs/queue length surveys – baseline, one year and five years after scheme implementation Trafficmaster data - monthly	To assess the impact of the scheme on traffic routing and the aim of reducing the attractiveness of the A50 as a through route To examine the scheme impacts on congestion, delays and travel times in the study area, in particular to determine whether any improvements in the A50 Woodgate area are mitigated by a worsening elsewhere	P2, 3, 4 S2, 3, 4, 5
Levels of Physical Activity & Mode Share: Number of commuting and total trips and modal share (highway, public	LLITM Public transport patronage data Cycle count data Pedestrian count data Household/employee travel surveys	Public transport patronage data – quarterly Cycle/pedestrian count data – annual Household/employee travel surveys – before and after implementation of Smarter Choices initiatives	To determine whether the scheme contributes to an increase in walking and cycling in the Waterside area To examine whether the scheme contributes to mode shift away from car	P1, 3 S1, 2, 5

transport, active modes) Number of pedestrian & cyclist trips in Waterside			towards more sustainable modes	
Road Safety: Number and severity of accidents recorded	Accident data / Killed or Seriously Injured (KSI) data	Continuous	To identify scheme impacts on road safety	S3, 5
Take-Up & Effectiveness of Smarter Choices Initiatives	Number of scheme participants e.g. Bike It / Walk It Qualitative feedback surveys on scheme effectiveness	Number of scheme participants – continuous Qualitative feedback - annual	To identify the take-up and impact of the Smarter Choices initiatives and learn lessons for future initiatives in terms of what does and doesn't work	P3, 4 S1, 2, 5
Economic Growth & Development: Unemployment/ Employment Number of Business Start-Ups Rental Values Business Feedback Vacancy Rates	National datasets on employment / unemployment Records of business start-ups Land data Business surveys in the Waterside area Surveys of vacant properties in scheme area	National datasets on employment / unemployment, records of business start-ups, land data – continuous Business surveys/vacancy rates – before, one year and five years after scheme implementation	To identify the impacts of the scheme on the local economy, in terms of business investor confidence and satisfaction with Leicester as an investment location and employment levels To assess the direct impacts of the scheme on vacancy rates in the immediate local area	P1 S4, 5
Air Quality	Air quality monitoring data (NO2, PM10) from the permanent sites on St Matthews Way and Vaughan Way Vehicle kilometres, speed and type data from ATCs, MCCs and Trafficmaster data, inputted to the DfT's carbon tool to assess changes in carbon as a result of the scheme	Before, one year and five years after scheme implementation	To identify whether there has been a change in nitrogen dioxide or particulate matter following scheme implementation To assess changes in carbon emissions associated with changes in vehicle distances, types and speeds as a result of scheme implementation	P2 S2, 5

5.11 Summary

5.10.14 The delivery strategy for LNWMTP Phase 2 (stage 1) has been informed by a series of lessons learnt on other similar major highway schemes, including LNWMTP Phase 1 which was delivered in 2015/2016. The benefits of ECI and early appointment of a traffic management contractor were established, alongside the importance of conducting on-site surveys rather than relying solely on drawings.

5.10.15 A governance structure is in place, with clear lines of accountability and communications between the constituent parts. Issues are escalated to the Project Board and resolved at monthly meetings.

5.10.16 The project programme indicates construction starting in July 2018 subject to Traffic Management coordinating considerations, with full completion by late Summer 2019. This means that the business case sign-off and approval for funding drawdown must be granted by the LLEP and LLTB by the end of May 2018 at the latest. Public consultation was completed in April/May 2017.

5.10.17 A risk log has been developed for Phase 2, that documents financial, design and construction risks and their probability and potential impact. A management strategy has been put in place to mitigate against each risk, and risks are being proactively monitored and issues escalated to the Project Board as appropriate.

5.10.18 An outline monitoring and evaluation plan has been put in place, which sets out the approach to understanding the impact of the Phase 2 scheme against the objectives set. Existing data collection activities will be used where appropriate, to reduce the potential burden of additional data collection.

6 Commercial Case

This demonstrates the commercial viability of the programme and the procurement strategy

6.1 Overview

6.1.1 The Commercial Case evidences the commercial viability of the Phase 2 (stage 1) scheme proposals, setting out the procurement strategy that was used to appoint a contractor for scheme delivery and identifying the contract management arrangements that will be put in place in terms of monitoring, measuring and incentivising supplier performance.

6.2 Output Based Specification

6.2.1 As set out in paragraph 2.9.1, the principal outputs for LNWMTP Phase 2 (stage 1) are as follows:

- Junction improvements at the /Blackbird Road/Anstey Lane/Ravensbridge Drive junction and at the Ravensbridge Drive/A6 junction;
- Provision of a new shared use footway/cycleway along the length of Ravensbridge Drive supported by upgraded pedestrian and cycle crossing facilities;

6.3 Procurement Strategy

6.3.1 The main contractor for the Phase 2 (stage 1) construction works was procured through the Midlands Highways Alliance (MHA) Medium Schemes Framework 2, which was also used as the procurement mechanism for Phase 1. MSF2 was launched in June 2014 as a replacement for MSF1, through which 60 schemes were successfully delivered by 13 Local Authorities, at a total value of nearly £250 million.

6.3.2 The works on MSF2 are split into two Lots, with five contractors appointed to deliver schemes of up to £5 million and three contractors appointed to deliver schemes with a value between £5 million and £25 million. The overall aim of the framework is the efficient delivery of highway schemes, through a culture of safety, innovation and collaboration and supported by objectives which encompass shared learning, effective use of resources and performance management.

6.3.3 Early Contractor Involvement (ECI) is being used on the Phase 2 (stage 1) scheme, which will generate cost savings through joint working, improved risk management and effective forward planning of resource requirements. ECI will also enable the Project Team to benefit from specialist advice at an early stage, enabling refinements to be made to the design where appropriate.

6.3.4 In the first quarter of 2017 a mini competition was held between the contractors on the framework, Tarmac were the successful contractor and ECI commenced in January 2018. It is expected that Leicester City Council will enter into a contract with Tarmac in late May 2018 following receipt of an agreed target price.

6.3.5 A full tender exercise through the City Council's standard procurement procedures was considered; however, this was discounted due to the length of time it would take and the likely high cost of tenders returned.

6.3.6 Any specialist suppliers and contractors that are required as part of the delivery phase will be procured separately through Leicester City Council's standard procurement procedures on an as required basis.

6.3.7 Tarmac are required to obtain three quotes for their sub-contracted works.

6.4 Contract Management

6.4.1 The MHA Performance Management Toolkit will be used to support effective contract management on Phase 2 (stage 1). The Toolkit enables the performance of the whole project team to be monitored in relation to each work package carried out, and the information is used not only to assess the performance of individual scheme delivery, but also to allow schemes that were delivered through MSF2 to be benchmarked against schemes delivered through other procurement methods. MSF2 also includes a pain / gain mechanism to incentivise supplier performance.

6.4.2 The Toolkit assesses the quality of delivery against ten key quality aspects: Product; Service; Right First Time; Cost Management; Time; Safety; Learning and Development; Community; Traffic Management; Innovation and Quality for Money. Scores are allocated to each aspect and an overall score out of ten is calculated. Schemes assessed as scoring an eight or more are generally considered to be performing at the level expected under the MHA. Scheme scores are collected every two months whilst work is on-site.

6.4.3 A City Council officer or appointed consultant will be based on site for the contract duration. The officer will work directly with the contractor during the delivery phase to monitor progress, ensure that work is being carried out to agreed standards and to resolve and where necessary escalate any issues that arise.

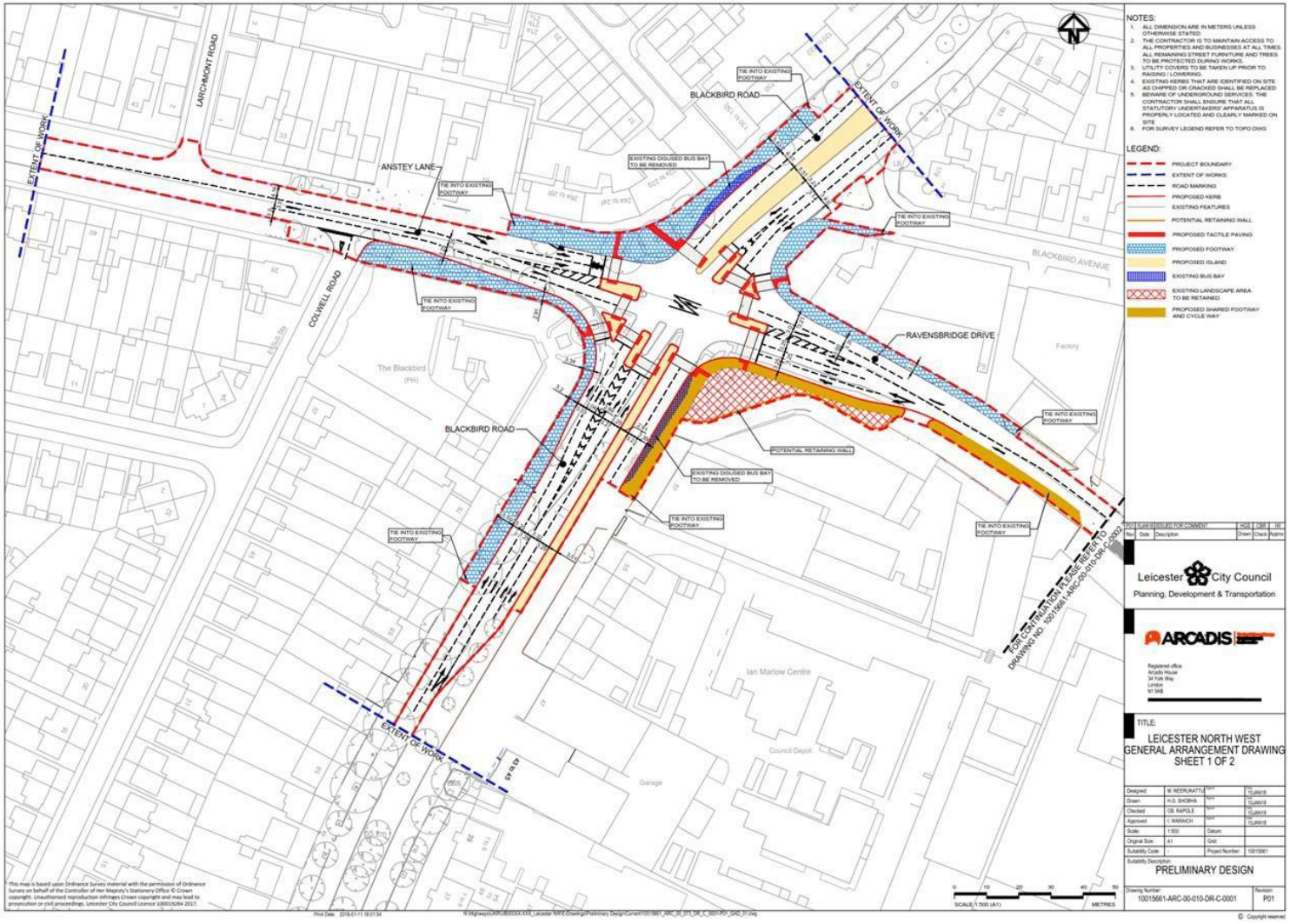
6.5 Summary

6.4.4 The main contractor (Tarmac) for the Phase 2 (stage 1) works was appointed through the MHA MSF2, an established procurement route that was used successfully in Phase 1. The use of ECI will help to achieve cost savings through the provision of specialist advice into the design finalisation process and identifying and mitigating any issues or potential risks that could cause delays to the delivery programme.

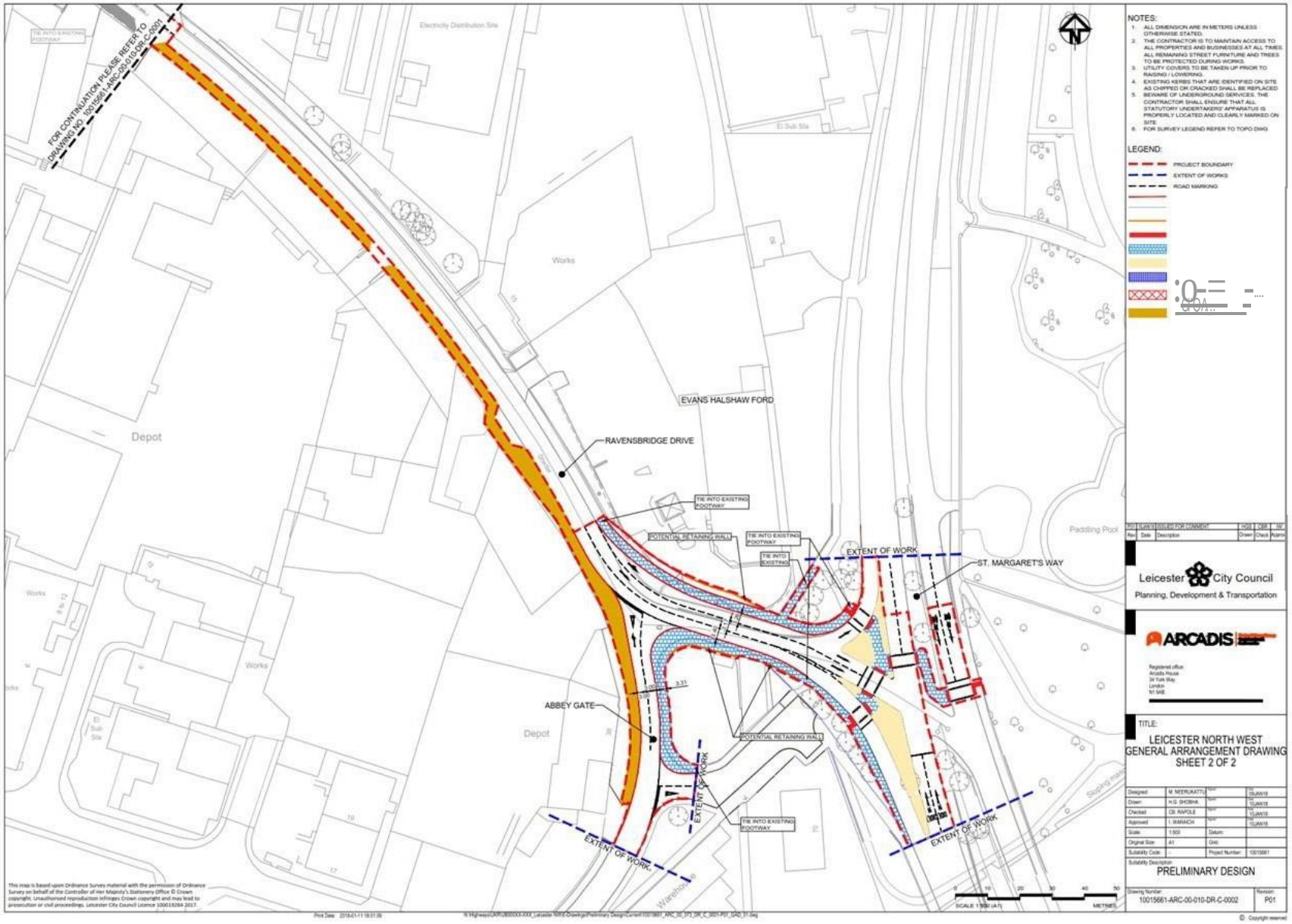
6.4.5 MSF2 includes robust contract management and monitoring procedures, that enable the assessment of an individual scheme and benchmarking with other similar schemes. An officer will be based on site for the contract duration to ensure effective delivery.

Appendix A. Scheme Drawings

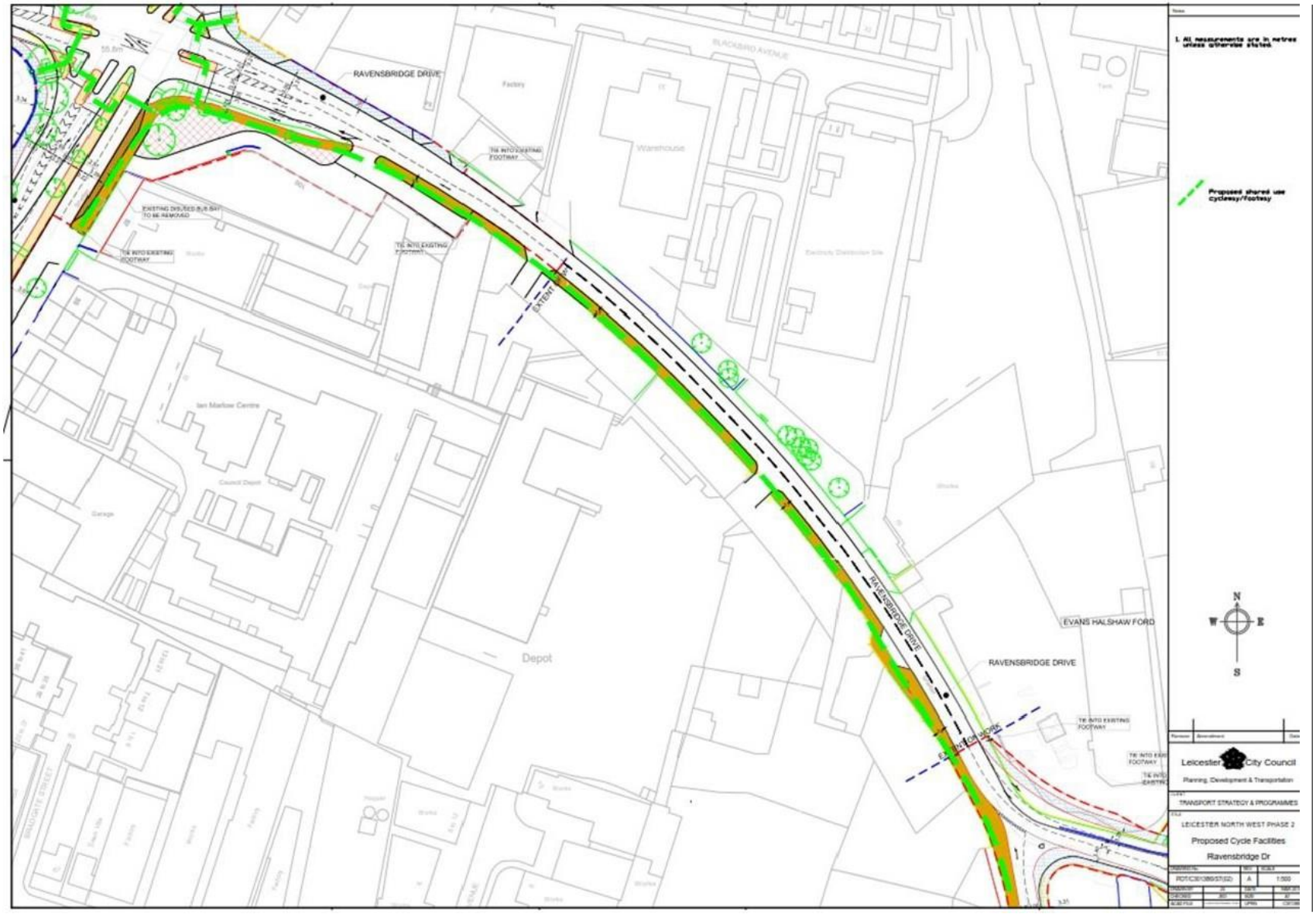
Appendix A1: Anstey lane / Blackbird Road / Ravensbridge Drive



Appendix A2.: Ravensbridge Drive / A6

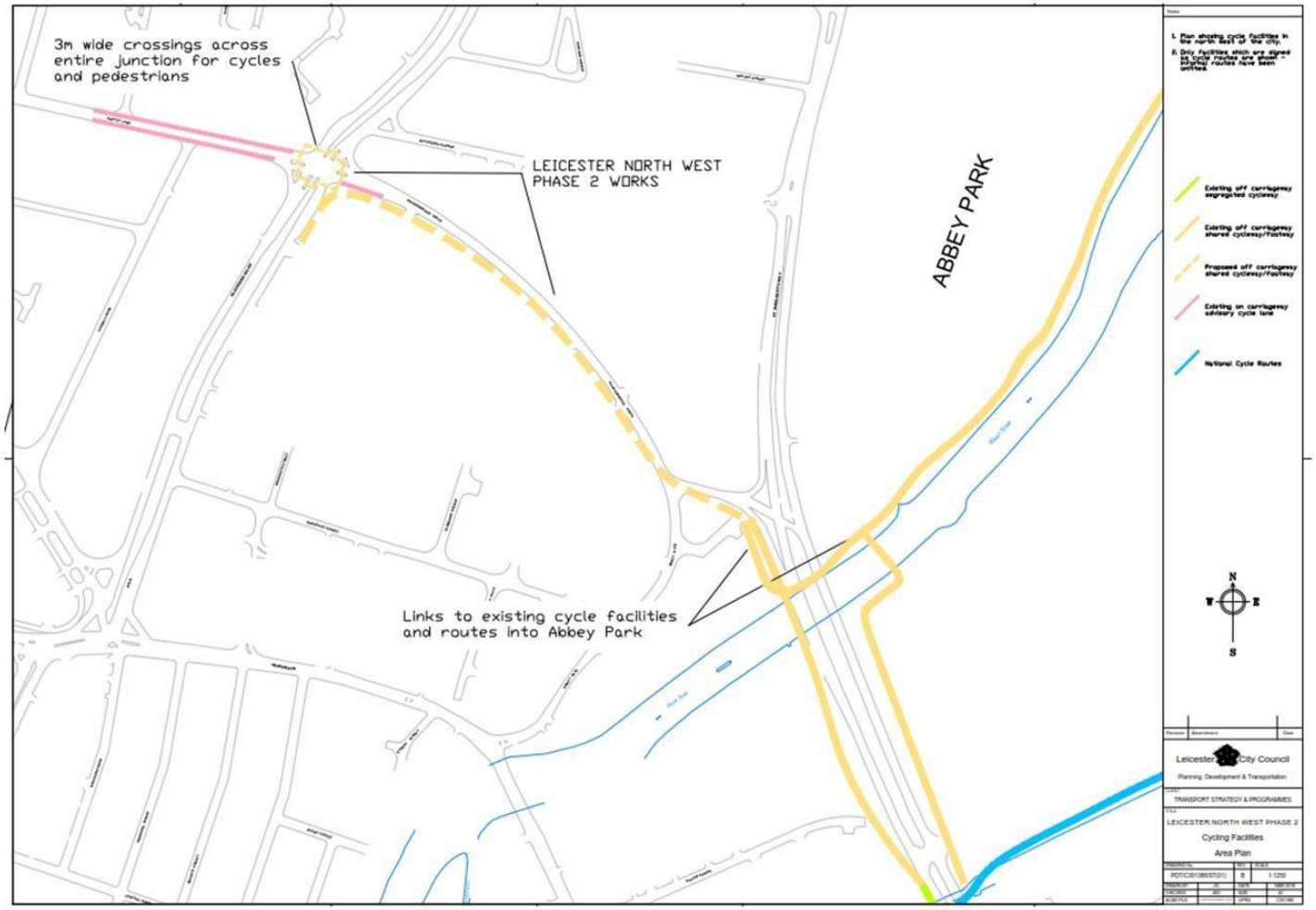


Appendix A3: Walking/Cycle Path on Ravensbridge Drive

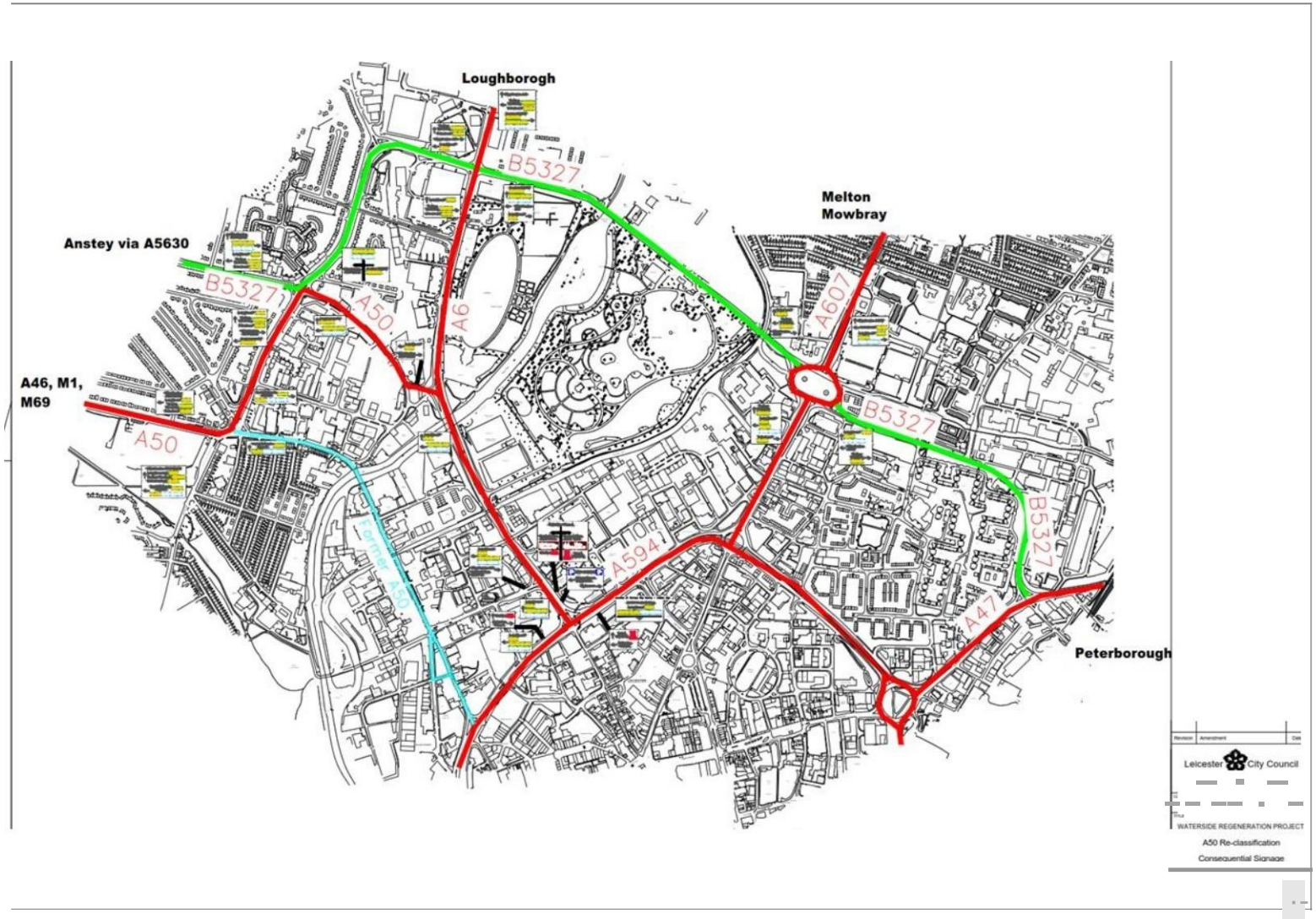


Appendix B. Cycle Opportunities Map

Appendix B: Map of opportuntiies



Appendix C. Revised Signage Strategy Map



Appendix D. Referenced Documents

Background for LNW Phase 2		
Reference	Notes	
00	Waterside Transport Mitigation Assessment (Dec 2015)	
01	LNW phase 1 business case (Apr 2015)	
02	EAST+ Identification, Scoring, Prioritisation and sifting (Oct 2015)	
03	Recommending the Waterside North Scheme to be taken forward as LNWph2 (Feb 2016)	
04	Initial Strategic Modelling results (Apr 2016)	
05	Initial Economic Modelling of Phase 2 (July 2017)	
Proposals to Move Forward the scheme as LNW Ph2 (Stage 1)		
12	Junction Accident Report (2018)	
Consultation		
20	Public Consultation Report	

Appendix E. Transport Modelling

Appendix E1: Linsig Modelling of the junctions
Appendix E2: LLITM model of Phase2 (part 1)

Appendix F. Active Mode Appraisal Toolkit Output

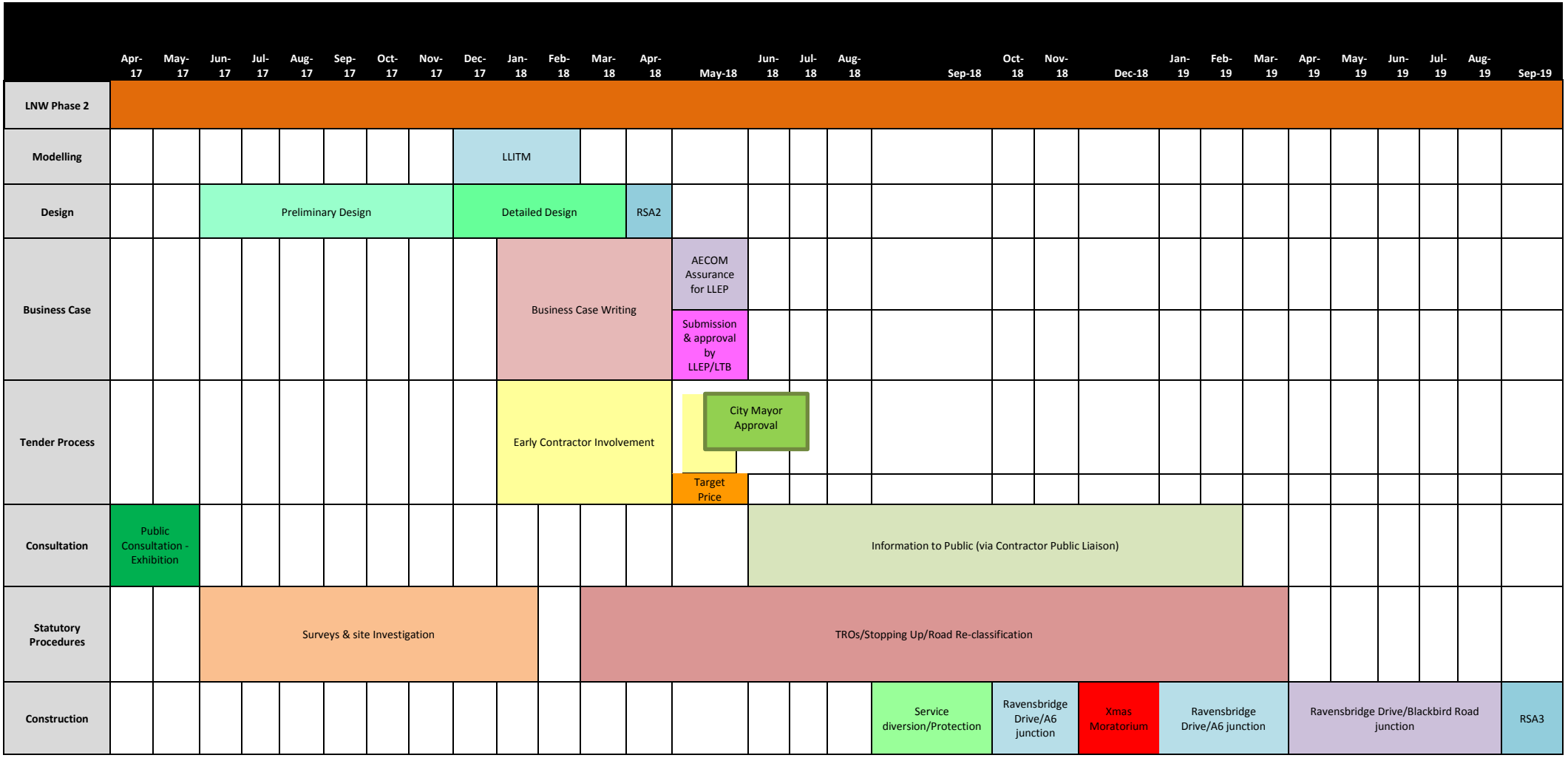
Apppendix F: AMAT Spreadsheet

Appendix G. Appraisal Summary Table

Appendix G: Appraisal Summary Table

Appendix H. Project Programme

The Project Programme for LNW Phase 2 (Part 1) is shown below.



Appendix I. Risk Register

RISK REGISTER

ARCADIS Design & Consultancy for natural and built assets

Project Details	
Project Name	Leicester North West
Project Number	10015661
Project Manager	Idris Waraich
Client	Leicester City Council
Date Version Created	13/02/2018
Version Created By	Conchita Munar

Risk Identification						Initial Risk Assessment (Risk level if risk is not managed)				Residual Risk Assessment (Risk level if risk is Managed)				Risk Management/Quantitative Analysis					
ID	Date Raised	Status	Risk Owner	Description of Risk	Potential Impact of Risk	Impact (I)	Probability (P)	Rating (I x P)	Risk Level	Impact (I)	Probability (P)	Rating (I x P)	Risk Level	Action	Comments	Action Owner	Least cost (£)	Most likely cost (£)	Max cost (£)
R - 1	10/12/2017	Closed	LCC	Delay agreeing preliminary design of Anstey Lane junction	Delayed delivery date and increased cost of reengaging team members allocated to different tasks	5	5	25	High	4	3	12	Medium	Delivery date of detail design package to be differed accordingly. Additional fees for design development to be agreed.	Delivery date delayed. Cost implications to be agreed separately.	LCC			
R - 2	10/12/2017	Closed	LCC	Delays providing information requested by the design team: pavement, topographical survey, traffic counts...	Delayed delivery date and increased cost of reengaging team members allocated to different tasks	4	5	20	High	4	3	12	Medium	Delivery date of detail design package to be differed accordingly. Additional fees for design development to be agreed.		LCC			
R - 3	10/12/2017	Open	LCC	Delay in Ground Investigation (not in scope of works). LCC instructed ARCADIS to commission it.	GI required to proceed with retaining walls structural design. Additional cost and potential impact on programme.	5	5	25	High	3	3	9	Medium	ARCADIS to liaise with TARMAC to resource GI	Now in progress. Height of retaining wall and scope of GI has been reduced in the refined vertical alignment.	ARCADIS / TARMAC			
R - 4	10/12/2017	Closed	LCC	Contractor not interested in reduced scope.	ECI not possible/delays due to lack of Contractor	4	3	12	Medium	4	2	8	Low	First ECI meeting scheduled for 12/01/218. Continuous liaison with Tarmac to ensure they remain interested in the project.	TARMAC is still interested and ECI is progressing.	LCC			
R - 5	10/12/2017	Open	LCC	Delays in LCC's approvals: TROs, Highways maintenance, Traffic Signals...	Delayed delivery date and increased cost of reengaging team members allocated to different tasks	4	4	16	High	4	3	12	Medium	Adequate monitoring: Project Progress Meetings to be held every 2 weeks between LCC and Design Team. Remainders of cost and time impacts will be issued prior to each meeting as well as updated Risk Register, Change Control and Programme.	TARMAC is collaborating with LCC maintenance team. ARCADIS will submit the signal design for approval to the ATM	ARCADIS /LCC/ TARMAC			
R - 6	10/12/2017	Open	LCC	Cost of utility diversions too high for the Project Budget	Details of new pavement depths to be issued to utility undertakers to ensure lowest cost of diversion. Alternative solutions with less impact would have to be explored. Programme and design costs will be affected.	4	4	16	High	4	3	12	Medium	Trial holes have been undertaken to confirm the location of the utilities on Anstey Lane and propose the layout which minimises the impact. Cvis will be requested again when details of the proposed 3D profile are available. Additional design work will be charged separately at framework rates.	Two additional trial holes have been requested by ARCADIS. A meeting to discuss the design with utility undertakers will be scheduled in due time.	ARCADIS /LCC			
R - 7	10/12/2017	Open	LCC	Further design iterations to find alternative solutions to the agreed preliminary design.	Delayed delivery date and increased cost of reengaging team members allocated to different tasks	4	4	16	High	4	3	12	Medium	Adequate monitoring: Project Progress Meetings to be held every 2 weeks between LCC and Design Team. Remainders of cost and time impacts will be issued prior to each meeting as well as updated Risk Register, Change Control and Programme.		LCC			
R - 8	10/12/2017	Open	LCC	Non-coordination with Ford Garage's fence.	Delays on mobilising for construction.	5	3	15	High	5	2	10	Medium	LCC to liaise with third party owner to ensure the fence is relocated prior to the commencement of works	LCC has notified the garage owner that the fence must be relocated by the end of April 2018.	LCC			
R - 9	10/12/2017	Open	Arcadis	Failure to meet agreed programme milestones for design delivery before and during ECI period	Delayed start of tender process. Potential additional cost for Contractor resulting in a higher bid.	4	3	12	Medium	3	2	6	Low	Internal design team meetings identifying potential problems well in advance to ensure ability for solutions and production of timely information.		ARCADIS / TARMAC			
R - 10	10/12/2017	Open	TARMAC	Temporary Traffic Management not acceptable	Could lead to delays delivering the tender package.	4	3	12	Medium	3	2	6	Low	Continuous ECI meetings to identify potential problems and agree on solutions.	TARMAC to meet LCC's TM team 14/02/18 and they will get 3 quotes from Subcontractors.	ARCADIS /LCC/ TARMAC			
R - 11	10/12/2017	Open	Arcadis	Proposed materials not suitable or not agreed	Delayed start of tender process. Potential additional cost for Contractor resulting in a higher bid.	4	3	12	Medium	3	2	6	Low	Continuous ECI meetings between LCC, TARMAC and ARCADIS to identify potential problems and agree on solutions.		ARCADIS / TARMAC			
R - 12	10/12/2017	Open	LCC	Trees not felled prior to construction	Delayed construction. Potential additional traffic management.	4	3	12	Medium	3	3	9	Medium	As no trees can be removed until September 2018, TARMAC will assess the implications and propose options to LCC to adjust the phasing of the works.		TARMAC			
R - 13	10/12/2017	Open	All	Lack of team working and own Agendas being pursued	Delays in all stages and higher fees.	4	3	12	Medium	3	2	6	Low	LCC, Arcadis and Contractor to work in spirit of co-operation with shared responsibilities and ownership.		ARCADIS /LCC/ TARMAC			
R - 14	10/12/2017	Open	LCC	Inaccurate utilities and services information affects proposed design and layout	Delays due to redesign work during construction.	4	4	16	High	3	3	9	Medium	Radar surveys carried out to specified lengths where planting or new carriageway is envisaged. Trial trenches undertaken and all service locations accurately measured. Revisit service details by Contractor early in process. Further trial pitting to be undertaken by Contractor prior to start on site to confirm location of tree pits.	Linked to risk 6	ARCADIS / TARMAC			
R - 15	10/12/2017	Open	Arcadis	Buildability of proposed details	Delays due to redesign work during construction.	4	3	12	Medium	3	2	6	Low	Discussions with TARMAC during ECI process to take place well in advance of final construction details being produced so details can be agreed.		ARCADIS / TARMAC			
R - 16	10/12/2017	Open	Arcadis	Inaccurate Cost Plan estimates - base rates wrong, fluctuations, errors in take off, inadequacy of design detail	Delays due to redesign work during construction and higher construction costs.	4	3	12	Medium	3	2	6	Low	Regular dialogue between TARMAC and ARCADIS to confirm any initial assumptions.		ARCADIS / TARMAC			
R - 17	10/12/2017	Open	LCC	Stg 2 Safety Audit recommendations that result in extra work.	Potential additional cost for Contractor resulting in a higher bid.	3	2	6	Low	2	2	4	Low	Advice taken on any aspects of design that have an uncertain safety element (e.g. barriers) prior to design being finalised.	Abbey Gate's corner radius will most likely be and issue. LCC was informed and acknowledge the risk. LCC to propose to business owners along Abbey Gate to use an alternative route to minimise HGVs overrunning Abbey Gate's exit lane.	ARCADIS /LCC/ TARMAC			
R - 18	10/12/2017	Open	Arcadis	LCC approval of street lighting equipment delays supply chain orders	Delayed start of tender process. Potential additional cost for Contractor resulting in a higher bid.	3	3	9	Medium	3	2	6	Low	TARMAC to liaise with LCC's Lighting team and subcontractors. LCC to provide a drawing in CAD with details of new ducting and new locations of lighting columns for ARCADIS to incorporate to the design.		ARCADIS /LCC/ TARMAC			