MOTT MACDONALD

Balsall Common Transport Study

Balsall Common Transport Study

October 2020

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Mott MacDonald
35 Newhall Street
Birmingham B3 3PU
United Kingdom

T +44 (0)121 234 1500
mottmac.com

Solihull Metropolitan
Borough Council
Council House
Manor Square
Solihull
B91 3QB

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Contents

Executive summary 1

1 Introduction 4
1.1 Introduction 4
1.2 Study Area 4
1.3 Background 5
1.4 Previous Work 5
1.5 Document purpose 5
1.6 Document Structure 6

2 Understanding the current situation 7
2.1 Introduction 7
2.2 Current National Policy 7
2.2.1 National Planning Policy Framework (2019) 7
2.2.2 Department for Transport's (DfT) Transport Investment Strategy 7
2.3 Current Region's Global Policy 8
2.3.1 Movement for Growth (2016) 8
2.3.2 West Midlands Net Zero (July 2020) 8
2.4 Current Local Policy 8
2.4.1 Solihull Connected Transport Strategy (2016) 8
2.4.2 Draft Local Plan (DLP) 9
2.4.3 Berkswell Neighbourhood Plan (September 2019) 9
2.4.4 Submission draft of Balsall Parish Neighbourhood Development Plan (On-Going) 10
2.4.5 Solihull Climate Change Prospectus (2020/2021) 10
2.5 Current Travel Demands and Level of Service 11
2.6 Study Area Function and Performance Summary 11
2.6.1 Land Use and Travel Demand 11
2.6.2 Highway Network 11
2.6.3 PRISM Modelling 12
2.6.4 Public Transport Network 12
2.6.5 Active Modes Network 12
2.7 Constraints Mapping Summary 12
2.8 Current Opportunities and Constraints 13
2.8.1 Opportunities 13
2.8.2 Constraints 13
2.9 Baseline and Constraints Conclusions 13

3 Understanding the future situation 15
3.1 Introduction 15

3.2 Summary of Current and Future Transport Issues and Challenges 15
3.3 Future land-use and policies 16
3.3.1 Draft Local Plan Sites 16
3.4 Future transport system changes 16
3.4.1 Cross City Sprints 16
3.4.2 East Birmingham Solihull Metro 17
3.4.3 Balsall Common Link Road 17
3.4.4 HS2 Interchange Station 17
3.5 Future travel demand 17
3.6 Link and Junction Analysis Results 18
3.7 Summary 22

4 Establishing the need for intervention 23
4.1 Introduction 23
4.2 Underlying drivers/causes of the problems listed 23
4.3 Summary 24

5 Identifying objectives 25
5.1 Introduction 25
5.2 Objectives from key policy documents 25
5.3 Objectives and measures for success 27
5.4 Summary of objectives and aims 28
5.4.1 Overall aims: 28
5.4.2 Core Objectives 28
5.4.3 Wider Objectives 28
5.5 Define geographic area of impact 28

6 Non-highway option development 30
6.1 Introduction 30
6.2 Background 30
6.2.1 Public Transport 30
6.2.2 Bus 30
6.2.3 Rail 30
6.2.4 Active Travel 31
6.2.5 Reducing Speed on Balsall Common High Street 31
6.3 Approach to delivery 31
6.3.1 Vision and Validate 31
6.3.2 FUTURES 32
6.4 Proposals 32
6.4.1 Active Travel Corridors 33
6.4.2 Traffic calming and speed reduction on A452 33
6.4.3 Core Walking Zones 34
6.5 Summary 35

7 Initial option assessment 36
7.1 Introduction 36
7.2 Multi-criteria assessment methodology 37
7.3 INSET Themes 37
7.4 Option scoring 38
7.5 Stage 1 - Weighting 38
7.6 Stage 1 – Initial Sifting 38
7.7 INSET Stage 1 Conclusion 40

8 INSET Stage 2: Longlist 42
8.1 Sifting - Stage 2 42
8.2 Longlisted schemes 43
8.2.1 Non-highways based option 43
8.2.2 Online highway (strategic level) 44
8.2.3 Alignment 1 Single carriageway (30mph) 44
8.2.4 Alignment 1 Single carriageway (50mph) 45
8.2.5 Alignment 1 Dual carriageway (50mph) 46
8.2.6 Alignment 2 Single carriageway (30mph) 47
8.2.7 Alignment 2 Single carriageway (50mph) 48
8.2.8 Alignment 2 Dual carriageway (50mph) 49
8.2.9 MfS 1 - Single carriageway (30mph) 50
8.2.10 MfS 2 - Single carriageway (30mph) 51
8.2.11 Alignment design cross section 52
8.3 Stage 2 - Criteria 54
8.4 Stage 2 – Weighting 54
8.5 Stakeholder Meeting 54
8.6 INSET Stage 2 - Results 54
8.7 INSET Stage 2 Conclusion 56

9 INSET Stage 3: Detailed option assessment 58
9.1 Development and assessment of options 58
9.2 Meer End Road/ A452 Junction 58
9.3 Stage 3 - Criteria 61
9.4 Stage 3 – Weighting 61
9.5 INSET Stage 3 - Results 61
9.5.1 PRISM Modelling Results 68
9.6 INSET Stage 3 Conclusion 70

10 Summary and Conclusion 71
10.1 Summary of the stages of assessment 71
10.2 Confirmation of the preferred option 71
10.3 Next Steps 72

A. Assessment criteria by INSET stage 73

B. Scheme options 74

C. PRISM Plots 75

D. Scheme costs 76

E. Optioneering Report 77

Tables

Table 3.1: Proposed Developments 16
Table 3.2: 2026 Development Growth – Capacity Results 20
Table 3.3: 2036 Development Growth – Capacity Results 21
Table 4.1: Transport Issues within Balsall Common 24
Table 5.1: Strategic objectives from key policy documents relevant to the Balsall Common study area 25
Table 5.2: Strategic Outcomes and measure of success 27
Table 7.1: Stage 1 - Strategic Solutions 36
Table 7.2: INSET Stage 1 Comparison of strategic solution scores (in order of rank) 38
Table 7.3: INSET Stage 1 - Strategic solution Scores (order of rank) 39
Table 7.4: INSET Stage 1 - Strategic solution summary 41
Table 8.1: INSET Stage 2 - Longlist scheme summary 42
Table 8.2: INSET Stage 2 - Comparison of Longlist options scores (in order of rank) 55
Table 8.3: INSET Stage 2 - Scores (order of rank) 55
Table 8.4: INSET Stage 2 - Longlist summary 56
Table 9.1: INSET Stage 3 - Comparison of shortlist options (in order of rank) 62
Table 9.2: INSET Stage 3 – shortlist options scores (in order of rank) 63
Table 9.3: INSET Stage 3: All themes narrative and scores 64
Table 9.4: INSET Stage 3 – Final 70

Figures

Figure 1.1: Study Area 4
Figure 3.1: 2017 Base Year - Capacity Results 19
Figure 5.1: Area of Impact 29
Figure 6.1: Triple Access Planning Framework 32
Figure 6.2: Proposed Non-Highway Option 33
Figure 6.3: DLP High Street Speed Reduction, 2036 AM 34
Figure 8.1: Proposed Non-Highway Option 44

Figure 8.2: Alignment 1 Single carriageway (30mph) 45
Figure 8.3: Alignment 1 Single carriageway (50mph) 46
Figure 8.4: Alignment 1 Dual carriageway (50mph) 47
Figure 8.5: Alignment 2 Single carriageway (30mph) 48
Figure 8.6: Alignment 2 Single carriageway (50mph) 49
Figure 8.7: Alignment 2 Dual carriageway (50mph) 50
Figure 8.8: MfS 1 - Single carriageway (30mph) 51
Figure 8.9: MfS 2 - Single carriageway (30mph) 52
Figure 8.10: Single carriageway cross section 53
Figure 8.11: Dual carriageway cross section 53
Figure 9.1: Meer End Road/ A452 Signalised Junction Roundabout Layout 59
Figure 9.2: Meer End Road/ A452 Junction Staggered Junction Layout 60
Figure 9.3: Meer End Road/ A452 Junction Roundabout Layout 61
Figure 9.4: DLP 30mph and 50mph Link road 2036 AM 68
Figure 9.5: SLP and DLP Link Road 2036 AM 69
Figure 9.6: SLP and SLP without Link Road 69

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Executive summary

To support the Draft Local Plan Review, Solihull Metropolitan Borough Council (SMBC) require a comprehensive transport evidence base, detailing the impacts of the revised plan on the transport network and any potential supporting mitigation measures.

Balsall Common is identified in both the Housing Strategy and the Employment Strategy of the Draft LPR as the focus of a large amount of development growth over the next 10 to 20 years.

This Options Assessment Report has been produced to identify a preferred alignment of a link road in Balsall Common. The scheme is proposed by SMBC and is seen as a priority investment to improve the operation of the network, its impacts on local residents, and to provide capacity and resilience which will facilitate and mitigate for planned growth of the Draft Local Plan. A broad alignment buffer area is required be progressed to the next stage of assessment, pulling together evidence that exists and work that has been undertaken by SMBC over recent years.

Current and Future Issues

At present, the majority of traffic travels directly through Balsall Common, on the A452, as there are no other key routes to the M42. Significant congestion is found on Kenilworth Road through Balsall Common, particularly the on Kenilworth Road on the northbound approach to Balsall Common and the Kenilworth Road / Alder Lane signalised junction.

The operation of the highway network is also, crucially, predicted to worsen with every new group of development, with Balsall Common the focus of a large amount of development growth over the next 10 to 20 years. With development traffic for both 2026 and 2036 taken into account, the highway network in Balsall Common is predicted to operate above capacity in various locations, particularly on the A452 Kenilworth Road, which is the busiest road in the study area and the focus of this Study.

Level of Anticipated Growth

Therefore, an improvement scheme for Balsall Common is a necessary intervention, due to the proposed level of additional trips and trip growth till 2036. The reasons for the level of growth attributed to Balsall Common include:

- UKC;
- Blythe Valley Park;
- Draft Local Plan Development Quanta;
- Passenger growth at Birmingham Airport; and
- Traffic to Birmingham Interchange High Speed Two railway station, once the high-speed railway line opens.

To improve the operation of the road network in Balsall Common, the subsequent impact on residents, and strengthen the capacity and resilience the borough has to growth over 1,415 new homes and 420 additional school places by 2036, the local road network needs to be altered.

Constraints

As part of this study, multiple constraints have been identified which need to be overcome to implement the transport package schemes which will aim to resolve the issues. The proposed development sites could impact the alignment of the link road route, alongside flood areas and rail infrastructure.

The Meer End Road junction has been explored in further detail, with three concept level designs being developed. This has informed the alignment route and all three options could be delivered, subject to further detailed design work.

Study objectives

Several strategic objectives were identified as part of this study. The overall aims are as follows:

- Provide infrastructure to deliver the future strategic growth of the village and ensure that growth and investment can be achieved across Solihull Borough.
- Improve social, economic and environmental outcomes for Balsall Common's existing and future residents, ensuring the village is fit for the future.

Non-highways interventions and active travel

A review of the existing public transport infrastructure, as well as the pedestrian environment, was also undertaken during a site visit. This identified opportunities to 'lock in' the benefits of a link road, with a non-highways option developed using the Predict and Provide approach. This proposes to reduce speed along the High Street, to reduce focus on vehicle movements and accommodate active travel measures incorporating placemaking principles and improvements to the high street environment. Significant improvements to pedestrian and cycle access to Berkswell Station are also proposed enabling a safe and secure route.

Option Assessment summary

Mott MacDonald's in house Multi Criteria Assessment Framework tool INSET (Investment Sifting and Evaluation Toolkit (INSET) was used to conduct a three staged appraisal process:

Stage 1 - Appraising a range of strategic level solutions (rather than specific interventions) including all transport modes, managing demand as well as an option to do nothing. The result of Stage 1 was the identification of online and offline highway approaches to be the focus for the remainder of the appraisal process. A non-highways based solution was also taken forward.

Stage 2 - Undertaking a long-listing exercise identifying many feasible online and offline highways options which fall under the preferred strategic approach, and then assessing those options against a range of social, economic and environmental criteria to lead to a shortlist. The outcome of Stage 2 was the progression of the following options for further appraisal:

- Non-highways-based option
- Alignment 1 Single carriageway (30mph)
- Alignment 1 Single carriageway (50mph)
- Alignment 2 Single carriageway (30mph)
- Alignment 2 Single carriageway (50mph)
- MfS 1 - Single carriageway (30mph)

Stage 3 - Appraising the shortlisted options to understand in greater depth the likely impacts and deliverability of the scheme options. The result of the appraisal was the identification of a

preferred option to identify an area of influence from which a link road scheme could be delivered.

Confirmation of the preferred option

The preferred option to be taken forward at this stage is Alignment 1 Single carriageway (50mph). This option has been shown to score the highest in all themes and against most criteria throughout the assessment.

The scoring suggests the implementation of a low-cost option would not deliver the level of transport benefit associated with higher cost options. The ability to improve strategic connectivity and severance whilst alleviating congestion would be significantly less if a low-cost option was progressed. However, the non-highways based option could be delivered as part of the overall scheme and would complement the introduction of a new link road.

Next Steps

A Strategic Outline Business Case (SOBC) is recommended to be developed in due course that demonstrates the case for investment at a strategic level and provides the basis for more detailed development work on the scheme. Further detailed design work is recommended to take place at the Meer End Road junction.

Stakeholder engagement is recommended to take place as the scheme develops.

Further design work is recommended to take place on the active travel and non-highways proposals, which establishes a package of measures in addition to a proposed link road. Walking, cycling and public transport links could integrate these proposals with employment, education, leisure and healthcare opportunities with the wider area to ensure that the benefits are widespread.

1 Introduction

1.1 Introduction

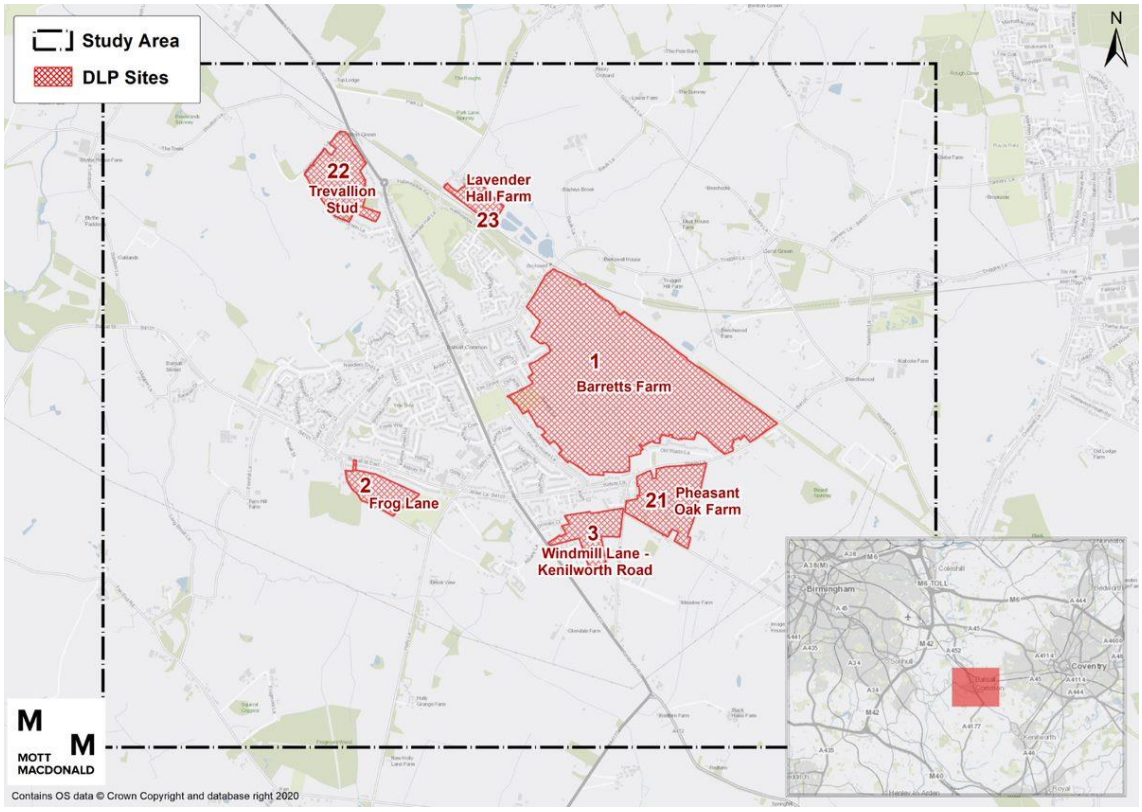
Mott MacDonald has been commissioned by Solihull Metropolitan Borough Council (SMBC) to provide advice in relation to part of the transport evidence base needed to support the ongoing review of the Draft Local Plan (DLP). This advice is being developed by the Balsall Common Transport Feasibility Study.

This Options Assessment Report has been produced to identify a preferred alignment of a link road in Balsall Common. The scheme is proposed by SMBC and is seen as a priority investment to improve the operation of the network, its impacts on local residents, and to provide capacity and resilience which will facilitate and mitigate for planned growth of the DLP.

1.2 Study Area

The Study Area has been agreed with SMBC enabling a detailed focus on Balsall Common itself to give a comprehensive assessment of the highway issues directly affecting the settlement. The Study Area, along with proposed developments in Balsall Common, is shown below in Figure 1.1.

Figure 1.1: Study Area



Source: SMBC and Ordnance Survey Mapping

1.3 Background

The Government's plans for high speed rail were given Royal Assent in February 2017, giving HS2 Limited the full legal, financial and planning powers to build Phase One of the scheme. The first HS2 station outside of London is to be built in Solihull on land next to the M42 and opposite the National Exhibition Centre (NEC), with works scheduled to start in 2017 and construction complete by 2026. The Interchange station will be constructed on land that is currently within the Green Belt, as part of the new Birmingham International Hub connecting it with the NEC, Birmingham International Station and Birmingham International Airport. To ensure that a robust planning framework is in place that addresses these issues, the Council is undertaking a Local Plan Review (LPR).

To support the LPR, SMBC require a comprehensive transport evidence base, detailing the impacts of the revised plan on the transport network and any potential supporting mitigation measures. Balsall Common is identified in both the Housing Strategy and the Employment Strategy of the Draft LPR as the focus of a large amount of development growth over the next 10 to 20 years. The impact of this intensification of growth is likely to place considerable strain on the Balsall Common transport network. Although these housing and employment allocations are not listed as being dependent on new infrastructure requirements, transport interventions are likely to be needed to enable sustainable economic growth of Balsall Common and the district.

1.4 Previous Work

Mott MacDonald were initially commissioned in 2017 to provide advice for a strategic evidence base and have since developed an initial option assessment for alignments of the Balsall Common link road. Several reports were produced by Mott MacDonald between 2017 and 2020, to support Solihull Metropolitan Borough Council (SMBC) with the local plan review. This report should be read in conjunction with these previous reports referenced below:

- Baseline & Constraints Report - 415790-MMD-BCTS-XX-TN-TP-001
- Impact of Future Growth on the Network - 415790-MMD-BCTS-XX-TN-TP-002
- Optioneering Report - 415790-MMD-BCTS-XX-TN-TP-003

The previous optioneering work completed by Mott MacDonald in 2018 looked to provide information on the best alignment for the Balsall Common link road. This report is included for reference in Appendix E. This assessed three broad route corridors (eastern, western and central) which could:

- Facilitate growth in housing and employment in Balsall Common and the wider Region
- Minimise interaction with pre-existing environmental constraints
- Increase capacity, alleviate peak-time congestion and improve safety outcomes along the A452 corridor
- Separate through traffic from local traffic

The outcome of this initial sifting was that an eastern route was the most beneficial option, which is the focus of this report.

1.5 Document purpose

This Option Assessment Report (OAR) summarises the key transport problems, transport needs, objectives and high-level options for the Balsall Common link road. Much of this work is referenced in previous work as described above.

The overarching aim of the OAR is to identify reasons why a preferred alignment is identified at this stage in order to safeguard a broad route buffer area to be progressed to the next stage of assessment, pulling together evidence that exists and work that has been undertaken by SMBC over recent years.

1.6 Document Structure

The structure of this document matches the eight-step framework that is recommended for the options development stage in the DfT's Transport Appraisal Process (TAP). These eight steps have been grouped as follows:

- Section 2 presents evidence to build an understanding of the current situation on the surrounding network in terms of current travel demands and levels of service, current policies and the potential opportunities and constraints that can be identified from the current circumstances.
- Section 3 discusses what can be expected in terms of the expected (future) transport problems on the network.
- Section 4 draw upon information collated to understand the need for intervention.
- Section 5 sets out the objectives against which any options will be measured and the geographic scope for intervention.
- Section 6 presents a 'long-list' of potential options that have been considered for addressing the transport problems, along with an initial assessment of those options. A 'short-list' of the best performing options is provided.
- Section 7 provided a more detailed assessment of the short-listed options.
- Section 8 confirms the options that are to be taken forward.

2 Understanding the current situation

2.1 Introduction

This section of the report develops the understanding of the existing conditions in the study area through providing an update to the baseline report. This examines the current transport, land use and other policies, travel demand and network operation, and opportunities and constraints. This is fully documented in the Baseline and Constraints report (document reference; 415970 | 002 | C).

2.2 Current National Policy

2.2.1 National Planning Policy Framework (2019)

The National Planning Policy Framework (NPPF) was originally published in 2012 and updated in 2019. The document sets out the Government's planning policies for England and how these are expected to be applied to achieve sustainable development. The planning system has three overarching objectives:

1. Economic Objective: to help build a strong, responsive and competitive economy, by ensuring that enough land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity, and by identifying and coordinating the provision of infrastructure
2. Social Objective: to support strong, vibrant and healthy communities
3. Environmental objective: to contribute to protecting and enhancing our natural, built and historical environment.

In building a strong competitive economy, planning policies should seek to address potential barriers to investment, such as inadequate infrastructure, services or housing, and a poor environment.

A scheme to encourage sustainable transport modes through Balsall Common will help reduce congestion and address current transport capacity limitations, unlocking the potential to deliver jobs and housing and enable strong economic development and stronger communities.

2.2.2 Department for Transport's (DfT) Transport Investment Strategy

The DfT's Transport Investment Strategy sets out the Government's strategy for transport investment in support of its Industrial Strategy. It identifies four strategic priorities:

- Creating more reliable, less congested, and better-connected transport network that works for the users who rely on it
- Building a stronger, more balanced economy by enhancing productivity and responding to local growth priorities
- Enhancing Britain's global competitiveness by making it more attractive place to trade and invest
- Supporting the creation of new housing

The strategy also outlines the development of a Major Road Network (MRN), which will form a middle tier of roads sitting between the national Strategic Road Network (SRN) and the rest of the local road network.

2.3 Current Region's Global Policy

2.3.1 Movement for Growth (2016)

The Movement for Growth document was published as part the West Midlands Strategic Transport Plan in 2016 by the West Midlands Combined Authority (WMCA). Its purpose is to co-ordinate investment to improve the region's transport infrastructure and create a fully integrated, safe and secure network.

Movement for Growth sets out the vision for transport within the West Midlands region over the next 10 years: Midlands economic 'Engine for Growth', clean air, improved health and quality of life for the people of the West Midlands. A summary of the key policies is below:

- The vision of the Movement for Growth is to make progress on clean air, improved health and quality of life for those in the Midlands.
- This will be done by creating a transport system befitting a sustainable, attractive and economically vibrant conurbation in the world's sixth largest economy. In support of this system we will: Introduce a fully integrated rail and rapid transit network that connects our main centres with quick, frequent services, and which is connected into wider local bus networks through high-quality multi-modal interchanges.
- Increase the number of people that are within 45 minutes travel time by public transport to a minimum of three main centres and the two HS2 stations in central Birmingham and the UK Central Hub.
- Reduce transport's impact on our environment- improving air quality, reducing carbon emissions and improving road safety.
- Use transport improvements to enhance the public realm and attractiveness of our centres.
- Facilitate the efficient movement of people on our transport networks to enable access to education and employment opportunities and health and leisure services.

2.3.2 West Midlands Net Zero (July 2020)

West Midlands Combined Authority (WMCA) issued a discussion document in July 2020, which detailed the launch of the net zero greenhouse gas emission ambition, to be met by 2041. Interim targets of a 36% reduction by 2022 and 69% by 2027 have been agreed. The discussion document details 74 measures which increases the rate of the reduction in greenhouse gases from 3.8% to 13% each year.

Additionally, SMBC have unanimously agreed to become carbon neutral by 2030, alongside a committed agreement to work with WMCA to achieve the 'net zero' emissions across the region from 2041. To become carbon neutral by 2030, work will be completed to review the previous policy and work that has already been undertaken.

2.4 Current Local Policy

2.4.1 Solihull Connected Transport Strategy (2016)

Solihull Connected identifies a mass-transit, inter-connected, multi-modal public transport system as the pinnacle of a public transport hierarchy, beneath which would sit buses and other public transport modes with local demand, integrating with the mass-transit system. Under the proposals set out in the Strategy, the rail station is key to integrating a planned mass-transit network with the town centre.

The Strategy links directly with plans for economic growth set out by our Council Managed Growth priorities and promoted by UK Central through the UK Central Hub Growth & Infrastructure Plan – March 2017 (updated October 2017). This will enable great mobility and connections for all by attracting major investment in our transport system and places – enhancing the Borough as an attractive, sustainable and economically vibrant place to live, work and visit. A summary of the strategic objectives is below:

- Objective 1: Ensure that major transport investment enables and manages growth to achieve the Council priorities for homes and jobs
- Objective 2: Support and enable the integrated delivery of sustainable and efficient forms of transport like mass-transit, cycling and walking
- Objective 3: Contribute to the council priorities to support people's everyday lives and improve health and wellbeing through the promotion of smarter choices programmes linked to major infrastructure investment
- Objective 4: Identify a prioritized short, medium and long-term delivery plan to achieve the overarching vision and objectives whilst recognizing the specific needs of the different parts of the borough
- Objective 5: Ensure the objectives of Solihull Connected are embedded in Local Plan and Health and Wellbeing policies to support walking, cycling and public transport use.

2.4.2 Draft Local Plan (DLP)

The Council commenced a review of the Solihull Local Plan in 2015, due to a number of factors: a legal challenge that deleted the housing requirement figure within the Plan; to assess the potential to contribute to the shortfall in the wider Housing Market Area; and to maximise the opportunities presented by the proposed HS2 Interchange station within the Borough.

The Draft Submission Plan proposes some minor amendments to the transport policies, and the overarching objectives include:

- Ensure that the transport network does not constrain economic growth; allowing growth and the consequential increase in travel demand to be accommodated without significant increases in congestion
- Address the challenges to improve air quality and reduce carbon emissions from vehicular transport
- Reduce the need to travel by guiding development to the most accessible locations, and manage travel demand by encouraging a shift to public transport and active travel modes and supporting sustainable transport initiatives in the Local Transport Plan
- Ensure that people can access local services, key employment and retail centres and education locations on foot, by bicycle and public transport.
- Consider the whole journey when planning travel and to ensure that all travel modes are accessible and attractive to all users.

2.4.3 Berkswell Neighbourhood Plan

The Berkswell Plan was formally adopted in September 2019 and provides a vision for the parish between 2019 and 2033. The plan has the accessibility and infrastructure objective to promote improved and safe accessibility to public transport links which include walking and cycling. Improved accessibility for Berkswell village is an objective of the neighbourhood plan

and is located within 2 miles of Balsall Common. It is highlighted that a lack of public transport connectivity and the absence of safe footways and cycle routes, mean that many journeys are made by car.

The new bridge over the west coast mainline associated with HS2 will have a footpath and safer cycling options. This has the additional possibility of connecting Berkswell to Balsall Common through an extension of the new footpath and cycle way into Berkswell and using the existing cycle way on Hallmeadow Road.

Policy B9: Improving Accessibility for All, states that development proposals should include linkages to existing footpaths and cycle routes, in order to improve connectivity. This policy implies that an additional focus is on active travel and improving connectivity in the area.

2.4.4 Submission draft of Balsall Neighbourhood Development Plan (On-Going)

The Balsall Common Neighbourhood Plan has reached Examination stage. There are several policies within the Submission Draft that support the movement towards more active and sustainable transport.

Policy COM.4 Encouraging Walking and Cycling indicates that developments should demonstrate the prioritisation of walking and cycling. Where proposals adversely affect the existing walking route or fail to encourage appropriate new walking and potential cycling opportunities will be resisted.

The community aspiration (CA3) is a village road, to redirect the traffic around Balsall Common to reduce congestion along the Kenilworth Road. This new route would mean that the Kenilworth Road would become a road for local access and provide a more environmentally friendly core for the local communities and the potential for walking and cycling routes. During the construction of HS2, haul routes should be implemented to minimise the need for construction traffic to use the main trunk road.

2.4.5 Solihull Climate Change Prospectus (2020/2021)

This document explains and provides guidance for a greener Solihull and was recently refreshed for 2020/2021. It includes visions and objectives, some of which specifically focus on sustainable travel.

- **An Accessible Borough:** A rebalanced mode share that is less dependent on the car, where road space is used more effectively, and streets are created for people and public transport.
- **Clean Air:** Develop high quality cycling routes through the LCWIP, develop partnerships with bus operators to optimise current and potential new delivery models. Have a refreshed Solihull Connected, through adopting a public transport, cycling and walking focus.

The UK Government declared a Climate Emergency in May 2019, followed in June 2019 with the target for 100% reduction in GHG emissions by 2050 (Net Zero). Solihull MBC declared a Climate Emergency in 2019, and are committed to the WMCA's target of reaching Net Zero emissions across the borough by 2041. This requires an overall reduction in vehicle miles and significant modal shift away from road traffic. Construction of a new road is at odds with these ambitions, and would not promote the modal shift required to reach Net Zero. The new road will increase vehicle miles and is likely to facilitate higher volumes of traffic.

This materially affects investment decisions, especially in the area of transport infrastructure. Legal challenge to both transport policy and major infrastructure projects has also gathered momentum in recent years, epitomised in the February 2020 Court of Appeal ruling regarding

Heathrow's third runway. In this case the court of appeal ruled that ministers did not adequately take into account the government's revised commitments to tackle the climate crisis with respect to carbon. Current legal challenges to Highways England's RIS 2 are also in process. Updates to the NPPF in 2018 embedded the principle of environmental "net gain" in relation to new development. Taken together, these provide grounds for challenge to any scheme which does not demonstrably provide environmental benefit and contribute to significant reduction in carbon emissions. The forthcoming Environment Bill is expected to reinforce this trajectory.

2.5 Current Travel Demands and Level of Service

The current level of transport demand and service is evaluated and explained in the Baseline and Constraints report (document reference; 415970 | 002 | C). This is summarised below:

The study area of Balsall Common has contrasting characteristics. The area is mainly residential, with the M42 running to the north of the borough. The roads throughout are primarily residential, with the exception of the A452.

Several sources of traffic data have been updated since within the baseline and constraints report, with additional surveys available. Due to COVID-19, additional surveys couldn't be commissioned, nor would be reflective of 'normal' transport conditions.

2.6 Study Area Function and Performance Summary

2.6.1 Land Use and Travel Demand

A summary of the Census data and data obtained from the Office for National Statistics has shown that population growth has fluctuated in Balsall Common between 2011 and 2017 and population growth is lower than the regional and national averages.

Of the working population in Balsall Common, 10% live and work in the area (thus a 10% internalisation rate). Of the internal commuters, 58% drive to work and 32% walk. Car use is much higher for commuters travelling to destinations outside Balsall Common, and for those commuters travelling into the settlement for work.

Furthermore, within Balsall Common there are average car ownership levels of 1.8 vehicles per household. This is significantly higher than regional and national averages and reflects the reliance on private motor vehicles in rural areas.

A review of land uses in Balsall Common and the wider area showed that Balsall Common is generally residential, with a small retail hub in the centre and surrounded by agricultural farmland.

It is also recognised, that the land currently benefiting from planning permission for new residential development (committed developments) and further land allocated in the Local Plan for housing is developed, this will contribute to a substantial increase in the resident population at Balsall Common.

2.6.2 Highway Network

Analysis of existing traffic data in Balsall Common shows the A452 (which runs north-south through the settlement) carries the largest volume of traffic in both peak periods (largest volume to the north of Balsall Common). An analysis of traffic profiles shows significant peaks in the AM and PM which suggests that commuting movements are the predominant trip purpose at these times.

An assessment of TrafficMaster data has helped identify significant congestion on Kenilworth Road, both through Balsall Common and on the northbound approach to the village.

The Kenilworth Road / Alder Lane signalised junction experiences congestion on all four arms in both peak periods.

In terms of road safety, formal personal injury collision data have been assessed over a five-year period within the defined study area. This assessment has shown a total of 31 collisions (2 fatal, 5 serious).

2.6.3 PRISM Modelling

PRISM (Policy Responsive Integrated Strategic Model), was used to model the future demand of the traffic within Balsall Common with the additional development quanta and potential mitigation measures. PRISM was used to extract baseline flows for the area surrounding UKC, to understand the impact of the development growth on the network.

PRISM was primarily used to evaluate and score the alignments of the proposed link road expanded on in Section 9.

2.6.4 Public Transport Network

Situated on the West Coast Mainline, Berkswell Railway Station is located in the north east of Balsall Common and is served by trains operated by West Midlands Trains. Passenger growth at Berkswell Railway Station is higher than the national average, with around 350,000 station entries / exits for the year 2018-2019.

There are two trains per hour to Birmingham New Street & London Euston (Monday to Saturday) with additional services to Northampton at peak times. Analysis of Census 2011 journey to work data shows Birmingham as a key destination for rail commuters.

In terms of the bus network, many services in Balsall Common are infrequent and / or do not operate at weekends. The 87, 88 and 89 services are the most frequent, operating on an hourly basis.

It is arguable that public transport will need significant improvement as a result of proposed developments in Balsall Common, as efforts are made to increase its modal share away from the personal motorised vehicle.

2.6.5 Active Modes Network

Pedestrian and cycle amenities were mapped in Balsall Common and the wider area, and this shows that there are many advisory cycle routes and good pedestrian amenity, including a newly established greenway which provides links to National Cycle Network Route 52.

In terms of pedestrian and cycle safety, there were a total of seven pedestrian collisions and four cyclist collisions within the study area in the assessed five-year period. There was one fatal collision, which involved a pedestrian and occurred on Kenilworth Road north of the junction with Wootton Lane.

2.7 Constraints Mapping Summary

- Committed Developments: Three sites with planning permission, one allocation carried over from the 2013 SLP and three sites in the Emerging Local Plan
- Green Belt: The vast majority of the Study Area is within the Green Belt, with the exception of Balsall Common itself and land within the Coventry City Council district boundary

- Agricultural Land: The majority of the Study Area falls within the Grade 3 Agricultural Land Classification, with smaller areas designated Grade 2, Grade 4 and Urban
- Land Ownership: SMBC has freehold control of land mainly in the north and south of the village, with other small areas of leasehold and possessory freehold land
- Heritage: There are several listed buildings in the Study Area, including two Grade I churches. There is also one scheduled monument and four conservation areas
- Environment / Ecology: There are several local wildlife centres in the Study Area, as well as four conservation areas, three local nature reserves and two SSSIs
- Geological Considerations: The majority of the Study Area lies within the Triassic Group, with the eastern section in the Warwickshire Group and a small area part of the Lias Group
- Topography: The whole Study Area lies within an 85m – 145m range of elevation, evidence of its gently rolling landscape. Balsall Common is between 10gm and 120m in elevation
- Landscape: There are no AONBs or ancient woodlands in the study area, and other studies by HS2 and Waterman PLC evaluate the landscape as farmed, with undulating topography
- Amenity: The Study Area is largely made up of arable farmland, with a mosaic of nature reserves, forests and parkland. Balsall Common itself is largely residential
- HS2: The HS2 alignment runs directly south-east to north-west to the west of Balsall Common, with a large construction boundary set up around the new line
- Public Rights of Way: There is an extensive footway network across the Study Area, with some bridleways, shared pedestrian footways and the Kenilworth Greenway
- Flood Risk: The vast majority of potential river flooding (Zone 3) is in the west of the Study Area around the River Blythe, with small areas of possible extreme flooding (Zone 2)
- Recreational Assets: Most recreational assets in the Study Area are concentrated in and around Balsall Common itself, as well as in Fen End, Temple Balsall, Berkswell and HS2
- Utilities: An oil pipeline, power line with pylons and multiple National Grid lines run through the Study Area

2.8 Current Opportunities and Constraints

2.8.1 Opportunities

Significant housing development planning for Balsall Common in the current and emerging local plan policies offer an opportunity to deliver transport infrastructure improvements. The provision of improved road infrastructure would remove through traffic from the centre of town. At present, the majority of traffic travels directly through Balsall Common, on the A452, as there are no other key routes to the M42. The provision of an eastern link road will remove this traffic from Balsall Common and will enable shorter journey times for all.

2.8.2 Constraints

Within the Balsall Common borough, there are multiple constraints which need to be overcome to implement the transport package schemes which will aim to resolve the issues. The proposed development sites could impact the alignment of the link road route, alongside flood areas and rail infrastructure.

2.9 Baseline and Constraints Conclusions

In conclusion, the baseline review of the transport situation in Balsall Common has identified several issues which will need to be considered in the context of future growth in the area. This baseline review will therefore be used to support further work which seeks to assess the impact

of proposed development and future growth in Balsall Common upon the transport network, and how this impact on the need for a transport intervention.

3 Understanding the future situation

3.1 Introduction

This section establishes the impact that future land uses, policies and technology will have on the level of service within the study area. As a result of this, future transport system changes are identifying and an assessment of the future travel demand in the area is established. This is fully documented in the *Impact of Future Growth on the Network* report (document reference; 415790-MMD-BCTS-XX-TN-TP-002).

This section considers the key issues facing the highway network in Balsall Common and the challenges local stakeholders face in mitigating the potential impact of traffic growth in Balsall Common, and in particular the A452 Kenilworth Road. With major planned developments including HS2, UK Central and housing sites allocated in the Solihull DLP on the horizon, ensuring Balsall Common's highway network is fit for purpose into the future is a key concern. This section is expanded upon in Balsall Common Stage 3 report, which includes an assessment of the proposed mitigation options and the impact that the developments will have on the network.

3.2 Summary of Current and Future Transport Issues and Challenges

Balsall Common has high levels of car ownership, with its relatively rural location contributing to this. Key employment centres such as Kenilworth, Warwick, Leamington and Solihull are not easily accessible by rail, and bus take-up is low. Furthermore, these employment centres are most easily accessible via the A452 Kenilworth Road, which is a key link between these settlements. With Balsall Common situated on this route, driving is the most popular form of transport, with residents contributing to the very high number of vehicles which travel along it, often at peak times.

The A452 is a pivotal route between south Warwickshire and the towns of Leamington, Warwick and Kenilworth, and the key economic zone of Solihull and east Birmingham, largely incorporated into what is now defined as UK Central. As demonstrated by the spreadsheet model analysis, the A452 is now struggling to cope with the levels using this route during peak times.

Traffic on the A452 passing through Balsall Common therefore creates congestion and delay. Between the Hallmeadow Road roundabout and A4177 Meer End Road junction, there is a roundabout, a signalised junction and four pedestrian crossings, all contributing to slow traffic movement and increased journey times. Without intervention, this road will become increasingly congested.

Thus, in order to reduce congestion and seek to mitigate the impact of traffic growth on Balsall Common at peak times, a range of options will be considered from low cost options, including non-highway measures, up to more significant measures such as an alternative highway alignment to 'by-pass' the village altogether.

3.3 Future land-use and policies

3.3.1 Draft Local Plan Sites

Proposed growth in terms of planned developments in the study area has been calculated, with data sourced from SMBC, with regards to the updated development quanta within Balsall Common, which sets out growth in the district up to 2036.

There are six sites for which development is proposed that are within the Study Area, potentially impacting on the highway network. These include major residential sites (see Table 3.1) and a new primary school (within the Barretts Farm site).

A large and multi-faceted quantum of development is planned within Balsall Common and the wider region over the next 10 to 20 years, which will undoubtedly have an impact on the surrounding highway network. These have been identified and grouped as:

- HS2 (Construction and Operational)
- UK Central
- DLP Review Sites

Table 3.1 provides information regarding large scale housing developments (80 dwellings or more) proposed within the Study Area, built by 2036. A significant quantum of development is proposed within Balsall Common, with all sites totalling 1,675 new dwellings and a large primary school serving 420 pupils.

Table 3.1: Proposed Developments

Site Name	Dwellings	Pupils
Barretts Farm	875	-
Windmill Lane	120	-
Frog Lane	110	-
Lavender Hall Farm	80	
Trevallion Stud	230	
Pheasant Oak Farm	200	
Barretts Farm Primary School	-	420

Source: SMBC

3.4 Future transport system changes

There are several large infrastructure projects affecting Solihull and particularly Balsall Common. These have the potential to pose significant changes to the travel patterns within Balsall Common and the transport infrastructure.

3.4.1 Cross City Sprints

The A34 and A45 sprint routes have been combined to create an uninterrupted cross-city route, which connected Walsall to Birmingham Airport and Solihull. This bus route will include priority signals, extending bus lanes and a more seamless boarding experience to help reduce journey times. Between Walsall town centre and Birmingham City Centre, journey times are set to improve an average of 20% in peak times.

With the priority signals not specific to sprint buses, an additional 30millions trips per year undertaken on the A34 and A45 will benefit from quicker journey times. The new route will offer express, zero carbon emissions, with the potential that the operator will cover the full cost of the

vehicles. The initial funding for the first phases was confirmed by West Midlands Combined Authority in 2020. The construction and delivery phases are expected to start soon.

3.4.2 East Birmingham Solihull Metro

The final expansion to the Birmingham Metro extension to be delivered by the Midland Metro Alliance will further extend the Eastside extension by approximately 17km to connect north Solihull and the HS2 interchange station. The route plays a main role in the regeneration of the area and encourages more of the public to choose green transport options for day-to-day travel.

This route, once opened, will increase employment and connectivity across the regions, allowing convenient and simple travel through the West Midlands.

3.4.3 Balsall Common Link Road

This report has been prepared to recommend a preferred alignment for the proposed link road on the eastern side of Balsall Common and is therefore likely to impact future land use within the study area.

The previous optioneering work completed by Mott MacDonald in 2018 (document reference 415790-MMD-BCTS-XX-TN-TP-003) looked to provide information on the best alignment for the Balsall Common link road. This report is included in Appendix E. This assessed three broad route corridors (eastern, western and central) which could:

- Facilitate growth in housing and employment in Balsall Common and the wider Region
- Minimise interaction with pre-existing environmental constraints
- Increase capacity, alleviate peak-time congestion and improve safety outcomes along the A452 corridor
- Separate through traffic from local traffic

The outcome of this initial sifting was that an eastern route was the most beneficial option, which is the focus of this report.

3.4.4 HS2 Interchange Station

The first HS2 station to be built outside of London, will be built in Solihull, on current greenbelt land adjacent to the M42. This station connects to the NEC and Birmingham International. The proposed site is located in Balsall Common.

The proposed station will also hold car parking facilities for 7,400 passengers and staff, and the station will form an integral part of UK Central, the centre of business and housing developments. Balsall Common will be integral to the development, with the A452/Park Lane junction a key junction which will be restructured to manage the demand and provide safe access to main HS2 construction compounds. The initial plan is to use Hall Meadow Road as a haul route, which would remove the majority of construction traffic from Kenilworth Road.

3.5 Future travel demand

This section presents the results of the traffic data analysis undertaken in the *Impact of Future Growth on the Network* report (document reference; 415790-MMD-BCTS-XX-TN-TP-002). This was undertaken using a bespoke spreadsheet model and compares our findings with the survey data and site observations conducted previously. This section has been updated to reflect the changes made to the proposed development quanta for the DLP sites.

3.6 Link and Junction Analysis Results

Analysis of traffic conditions at present and in multiple future scenarios has been undertaken through the spreadsheet model. Full results can be found in the *Impact of Future Growth on the Network* report (document reference;415790-MMD-BCTS-XX-TN-TP-002).

The eight scenarios that have been produced in the spreadsheet model from the 2017 Base Year are:

- Scenario 1: 2026 Base (with TEMPro background growth)
- Scenario 2: 2026 Base + HS2
- Scenario 3: 2026 Base + HS2 + UK Central
- Scenario 4: 2026 Base + HS2 + UK Central + DLP Sites
- Scenario 5: 2036 Base (with TEMPro background growth)
- Scenario 6: 2036 Base + HS2
- Scenario 7: 2036 Base + HS2 + UK Central
- Scenario 8: 2036 Base + HS2 + UK Central + DLP Sites

Figure 3.1, Table 3.2 and Table 3.3 present maps of link and junction capacities for the 2017 Base Year, 2026 Growth (Scenarios 1 to 4) and 2036 Growth (Scenarios 5 to 8) respectively.

Notes on these maps are as follows:

- Green lines and dots are below 85% capacity
- Amber lines and dots are between 85 and 100% capacity
- Red lines and dots are over 100% capacity
- Lines represent the worst peak period and worst direction to represent the worst-case scenario
- Dots show the worst peak period and worst arm of the junction to represent the worst-case scenario

In transport assessment terms, it is normal practice to assume that a link or junction is approaching capacity when the Ratio of Flow to Capacity (RFC) exceeds 85%; when the RFC exceeds 100% the link or junction is assumed to be operating in excess of capacity.

It is important to note that the analysis assumes the same capacity levels in future years.

Figure 3.1: 2017 Base Year - Capacity Results

Source: Mott MacDonald

As can be observed from Figure 3.1 above, no roads in the baseline are operating over capacity, with Hob Lane and A452 between Station Road and Lavender Hall Lane operating over 85% capacity. Additionally, two other junctions are close to capacity (85 to 100%), being the A452 Kenilworth Road / Station Road roundabout and the A452/Gipsy Lane junction. The Alder Lane/Kelsey Lane/A452 Junction is operating over capacity.

Despite the analysis undertaken for the link and junction data for Balsall Common, it must be noted that this does not give a full picture of traffic congestion and capacity levels on the network. This is because link flows can be affected by queueing at downstream junctions which in turn affect the results of the analysis, resulting in links shown as green despite there being slow but not stationary traffic due to downstream junction constraints.

For example, from our site observations, it is clear that the A452 Kenilworth Road suffers from congestion issues from north of the Hallmeadow Road roundabout to the A4177 Meer End Road junction, but this is shown as largely green in Figure 3.1 due to the traffic being slow-moving but not stationary. There are also links that we do not have data for, which could be approaching or already at capacity but cannot be commented on here. Note that these site observations are form 2017, having not been updated due to the COVID-19 pandemic.

As shown in Table 3.2 and Table 3.3, with development growth up to 2026 and 2036 taken into account the highway network in Balsall Common is predicted to operate above capacity in various locations, particularly on the A452 Kenilworth Road, which is the busiest road in the study area and the focus of this Study.

The operation of the highway network is also, crucially, predicted to worsen with every new group of development, with Balsall Common the focus of a large amount of development growth over the next 10 to 20 years.

Table 3.2: 2026 Development Growth – Capacity Results

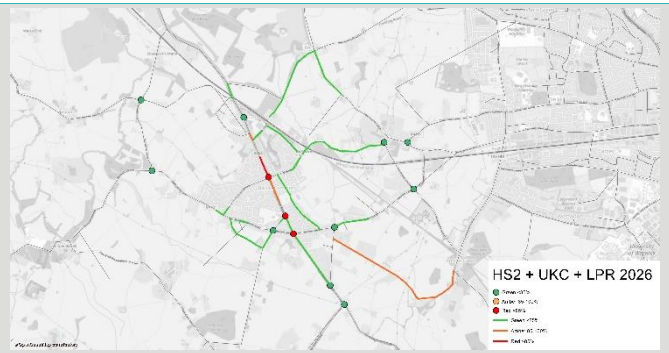
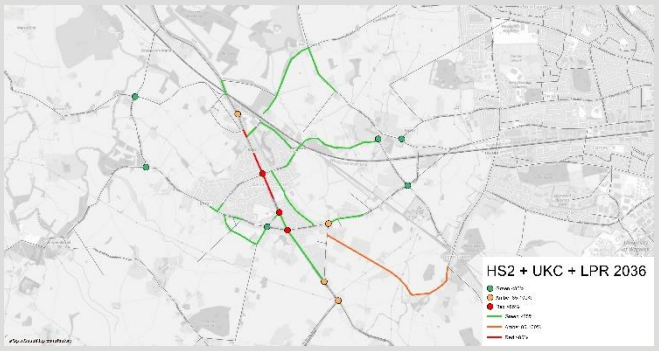
Scenario 1	Scenario 2	Comments
		• Scenario 1: There is no significant difference between the base • Scenario 2: HS2 traffic doesn't provide a difference to the 2026 Base Scenario. • Scenario 3: Junctions with Kelsey Lane/Alder Lane/A452, and A452/Station Road. The section of the A452 north of Station road is now operating over capacity, with the link south of the junction now at 85% capacity. • Scenario 4: There is no significant difference between Scenario 3 and Scenario 4. • **Summary: From the 2017 Base Year up to Scenario 4, including development resulting from HS2, UK Central and DLP sites, there are now three junctions over capacity and one approaching capacity. Furthermore, there is one link over capacity and three more approaching capacity.**
Scenario 3	**Scenario 4**	
		

Table 3.3: 2036 Development Growth – Capacity Results

Scenario 5	Scenario 6	Comments
		• Scenario 5: Compared to the 2017 base year, the Station Road/A452 junction is now operating over 100% capacity. • Scenario 6: The junction with Station Road and Gypsy Lane with the A452 are now over capacity, with the section of the A452 north of Station Road operating over capacity. A452 north of Lavender Hall Lane is between 85-100% • Scenario 7: No difference in the network capacity between Scenario 6 and 7. • Scenario 8: The northern section of the A452 near Lavender Hall Lane is now over capacity, with the southern section of the A452 past Station Road. • **Summary: From the 2017 Base Year up to Scenario 8, including development resulting from HS2, UK Central and Local Plan Review sites, there are a number of junctions and links over capacity.**
Scenario 7	**Scenario 8**	
		

3.7 Summary

Outputs from the spreadsheet model in combination with additional data obtained from site observations and queue survey videos, show that the A452 Kenilworth Road in Balsall Common is currently operating at, close to, or even above capacity in certain sections, whilst other individual links and junctions also suffer from capacity issues, such as Hob Lane and the B4101.

With development growth, up to 2026 and 2036 added in, the highway network in Balsall Common is predicted to operate above capacity in various locations, particularly on the A452 Kenilworth Road, which is the busiest road in the study area and the focus of this Study.

The operation of the highway network is also, crucially, predicted to worsen with every new group of development, with Balsall Common the focus of a large amount of development growth over the next 10 to 20 years.

4 Establishing the need for intervention

4.1 Introduction

This section takes the evidence from the current and future situations and understands the issues resulting from them. Previous work completed by Mott MacDonald in 2017 and 2018 provide evidence on the future transport-related problems. The following reports should be referenced:

- Impact of Future Growth on the Network - 415790-MMD-BCTS-XX-TN-TP-002
- Optioneering Report - 415790-MMD-BCTS-XX-TN-TP-003

Based on the evidence presented within this section, the key transport problems identified in the area of interest are:

- Continued congestion impacting journey times
- Insufficient capacity on local roads and at key junctions to accommodate the high traffic demand

Balsall Common has high levels of car ownership, with its relatively rural location contributing to this. Key employment centres such as Kenilworth, Warwick, Leamington and Solihull are not easily accessible by rail, and bus take-up is low. Furthermore, these employment centres are most easily accessible via the A452 Kenilworth Road, which is a key link between these settlements. With Balsall Common situated on this route, driving is the most popular form of transport, with residents contributing to the very high number of vehicles which travel along it, often at peak times.

The A452 is a pivotal route between south Warwickshire and the towns of Leamington, Warwick and Kenilworth, and the key economic zone of Solihull and east Birmingham, largely incorporated into what is now defined as UK Central. As demonstrated by the spreadsheet model analysis, the A452 is now struggling to cope with the levels using this route during peak times. Traffic on the A452 passing through Balsall Common therefore creates congestion and delay.

Between the Hallmeadow Road roundabout and A4177 Meer End Road junction, there are two roundabouts, a signalised junction and four pedestrian crossings, all contributing to slow traffic movement and increased journey times. Without intervention, this road will become increasingly congested. Thus, in order to reduce congestion and seek to mitigate the impact of traffic growth on Balsall Common at peak times, a range of options will be considered from low cost options, including non-highway measures, up to more significant measures such as an alternative highway alignment to ‘by-pass’ the village altogether.

4.2 Underlying drivers/causes of the problems listed

Based on the evidence collected and presented in the *Impact of Future Growth on the Network* report (document reference; 415790-MMD-BCTS-XX-TN-TP-002), Table 4.1 summaries the main causes of the transport problems identified in the Balsall Common Study area.

The evidence collected includes:

- PRISM Modelling
- Traffic Surveys

- Proposed Development Quanta
- Desktop Surveys

Table 4.1: Transport Issues within Balsall Common

Problem	Cause
Continued congestion impacting journey times	Additional residential dwellings increase the number of private car vehicles on the network.
Insufficient capacity on local roads and at key junctions to accommodate high traffic demand	A limited active travel network means that the majority of trips are made by private vehicles. With an active travel network, a reduction in trips made by vehicles will reduce increase the capacity available at junctions.
Pedestrian and Cyclist collisions on the A452	There is a hotspot for collisions involving cyclists and pedestrians off the A452. There is no dedicated cycle infrastructure.

Source: Mott MacDonald

The constraints currently associated with the current operation of Balsall Commons local and strategic road network is likely to be exacerbated in the future.

The increased traffic on the local road network will likely lead to:

- Increased journey times for all used and always of day
- Decrease in air quality
- Additional congestion through Balsall Common and associated collisions
- Decline in the perception of and ability to use sustainable modes of travel such as walking, cycling and public transport

4.3 Summary

An improvement scheme for Balsall Common is a necessary intervention, due to the proposed level of additional trips and trip growth till 2036. The reasons for the level of growth attributed to Balsall Common include:

- UKC;
- Blythe Valley Park;
- Draft Local Plan Development Quanta;
- Passenger growth at Birmingham Airport; and
- Traffic to Birmingham Interchange High Speed Two railway station, once the high-speed railway line opens.

To improve the operation of the road network in Balsall Common, strengthen the capacity and resilience and accommodate planned growth in the borough the local road network needs to be altered. Without intervention, this road will become increasingly congested. Thus, in order to reduce congestion and seek to mitigate the impact of traffic growth on Balsall Common at peak times, a range of options will be considered from low cost options, including non-highway measures, up to more significant measures such as an alternative highway alignment to ‘by-pass’ the village altogether.

5 Identifying objectives

5.1 Introduction

This section reviews key policy documents, pulling out any objectives which relate to Balsall Common. The documents under review are from both a national and local scale. The policy objectives will then be used to produce a series of strategic objectives, supported by further high-level objectives and transport objectives for the scheme. The objectives will be specific, measurable, achievable, realistic and time-bound (SMART). Measures of success will also be provided to ensure each objective is met.

In formulating the hierarchy of objectives, attention has been paid to ensure that:

- They address the transport problems identified in Chapters 2 and 3.
- They relate to the strategic objectives of the key policy documents reviews in Chapter 2 (DfT Transport Investment Strategy, NPPF, Movement for Growth, Solihull Connected). These documents provide national and regional, alongside local alignment with policy.

5.2 Objectives from key policy documents

As well as the national documents, the local planning authority has produced documents and policies for economic growth, spatial planning and transport to guide investment in transport infrastructure. These documents are:

- DfT Transport Investment Strategy (2017)
- NPPF (2019)
- West Midlands Movement for Growth (2016)
- Solihull Connected (2016)
- Solihull Local Plan (2013)
- Berkswell Neighbourhood Development Plan (2018)

Any proposed scheme must align with these plans and address the issues facing Balsall Common. The scheme must not have any significant negative impacts on wider objectives relating to safety, security and health, equality of opportunity, quality of life or the environment.

Table 5.1: Strategic objectives from key policy documents relevant to the Balsall Common study area

Document	Summary of Strategic Objectives
DfT Transport Investment Strategy, 2017	• Creating a more reliable, less congested and better-connected transport network that works for the users who rely on it • Building a stronger, more balanced economy by enhancing productivity and responding to local growth proposed • Enhancing our global competitiveness by making Britain a more attractive place to trade and invest • Supporting the creation of new housing
NPPF, 2019	• Economic Objective: to help build strong, responsive and completive economy, by ensuring that enough land of the right types is available in the right place at the right time to support growth, innovation and improve productivity • Social Objective: to support strong, vibrant and healthy communities

Document	Summary of Strategic Objectives
	• Environmental Objective: to contribute to protecting and enhancing our natural, built and historic environment.
Movement for Growth (2016)	• ECON1: to support growth in wealth creation (GVA) and employment in the West Midlands • ECON2: to support improved levels of economic wellbeing for people with low incomes in the West Midlands • POP1: To meet future housing needs, by supporting new housing development in locations deemed appropriate by local planning authorities • ENV1: to significantly improve the quality of the local environment • ENV2 to help tackle climate change by ensuring large decreases of greenhouse gas emissions • PUBH1: to significantly increase the amount of active travel in the West Midlands • PUBH2: to significantly reduce the number and severity of road traffic causalities in the West Midlands • PUBH3: to assist with the reduction of health inequalities in West Midlands • SOC1: to improve the wellbeing of socially excluded people.
Solihull Connected	• Ensure that transport capacity and congestion are not a constraint to growth and that major transport investment helps drive growth efficiently • Promote and support sustainable and efficient forms of transport and transport investment • Aim to support people's daily lives and well-being by providing door-to-door transport choices • Identify a prioritised short, medium- and long-term delivery plan to achieve the overarching vision and objectives whilst recognising and balancing the specific needs of the different parts of the borough • Guide future master planning and land use policies to ensure that the design and location of future development enables and encourages walking, cycling and public transport use.
Solihull Local Plan (2013)	• Close the gap of inequality between the most and least affluent wards in Solihull • Accommodate additional development to help meet the Boroughs local housing need, whilst ensuring high quality places across the borough. • Maximise the provision of affordable housing • Widen the range of options for older people and those with disabilities through provision of accommodation which is designed to meet the diverse needs • Ensure high quality design and development which integrates with its surroundings and creates safer, inclusive, adaptable and sustainable places • Conserve and enhance the quality of the built, natural and historic environment to contribute to character and local distinctiveness • Ensure development does not have an adverse impact on residential and other amenities • Support the continued success of key economic assets such as Birmingham Airport, National Exhibition Centre, Birmingham and Blythe Valley Business Parks and Jaguar Land Rover whilst maintaining the quality of the environment and managing congestion • Maintain the greenbelt in Solihull, to percent unrestricted expansion of the major urban area, to safeguard key gaps • Ensure the countryside is managed to deliver a range of benefits • Reduce the boroughs greenhouse gas emissions • Encourage the use of public transport by ensuring new development is in areas of high accessibility • Improve accessibility and ease of movement for all users to services, facilities, jobs and green infrastructure • Reduce the need to travel • Manage transport demand and reduce car reliance • Enable and increase the modal share of all forms of sustainable transport • De-couple economic growth and increase in car use

Document	Summary of Strategic Objectives
	• Create healthier and safer neighbourhoods • Enable people to pursue an active lifestyle and make healthier choices • Meet local housing and employment needs whilst facilitating the provision of appropriate health care services • Ensure that development does not have an adverse impact on physical and mental health and well being
Berkswell Neighbourhood Plan (2018)	• To provide type of property to attract young people to live and work here and resizing opportunity for elderly residents • To promote improved and safe accessibility to public transport links including walking, cycling, horse riding and public rights of way • To improve vehicular traffic flows through the parish • To provide adequate space for off-road parking in residential areas and for businesses • To support improved community spaces such as meeting halls and public open space for purposed of enjoyment for Balsall Common • To encourage the development of infrastructure for facilitating safe and secure environments, health, wellbeing, leisure and the community for all residents • To support investment in local economic development to meet local business' needs in the parish including farming which are not met more appropriately by the Solihull Local Plan and do not adversely impact on rural roads in the parish.

Source: Mott MacDonald

5.3 Objectives and measures for success

In order to reduce the congestion and improve capacity for future development in the study area, several strategic objectives were identified. These were discussed and agreed with SMBC officers.

Several SMART objectives have been identified in Table 5.2 to support the strategic outcomes of the study area. Targets were identified after considering the baseline situation set out in Chapter 2 and the potential impact of the scheme.

Table 5.2: Strategic Outcomes and measure of success

Strategic Outcomes	High Level Objectives	Measures for Success
Population and Economic Growth	Improved connectivity from the South to North of the borough.	Reduce journey time for vehicles travelling through Balsall Common
	Reduce through traffic movement	Reduction in traffic on the A452 between Windmill Lane and Lavender Hall Lane.
Sustainable Growth in Balsall Common	Improve connectivity by sustainable modes in Balsall Common	Provide enhanced opportunities for local access to Balsall Common and future transport connection by sustainable modes
Physical and Mental Wellbeing	Reduce personal injury accidents on the road network	Reduction in personal injury accident rates and the severity on the A452 and Balsall Common as a whole
	Minimise the impact of transport on the local environment	Reduce noise and air quality near local receptors

Source: Mott MacDonald

5.4 Summary of objectives and aims

The following summary of aims objectives encompasses all of the relevant policy detailed in Table 5.1.

5.4.1 Overall aims:

- Provide infrastructure to deliver the future strategic growth of the village and ensure that growth and investment can be achieved across Solihull Borough.
- Improve social, economic and environmental outcomes for Balsall Common's existing and future residents, ensuring the village is fit for the future.

5.4.2 Core Objectives

- Provide increased capacity, reducing existing congestion and journey times and providing scope for change to accommodate more balanced use of road space.
- Improve connectivity to socio-economic opportunities.
- Create safe communities that are attractive to both residents and businesses.
- Reduce levels of through traffic and congestion within Balsall Common.
- Improve pedestrian and driver safety within Balsall Common.

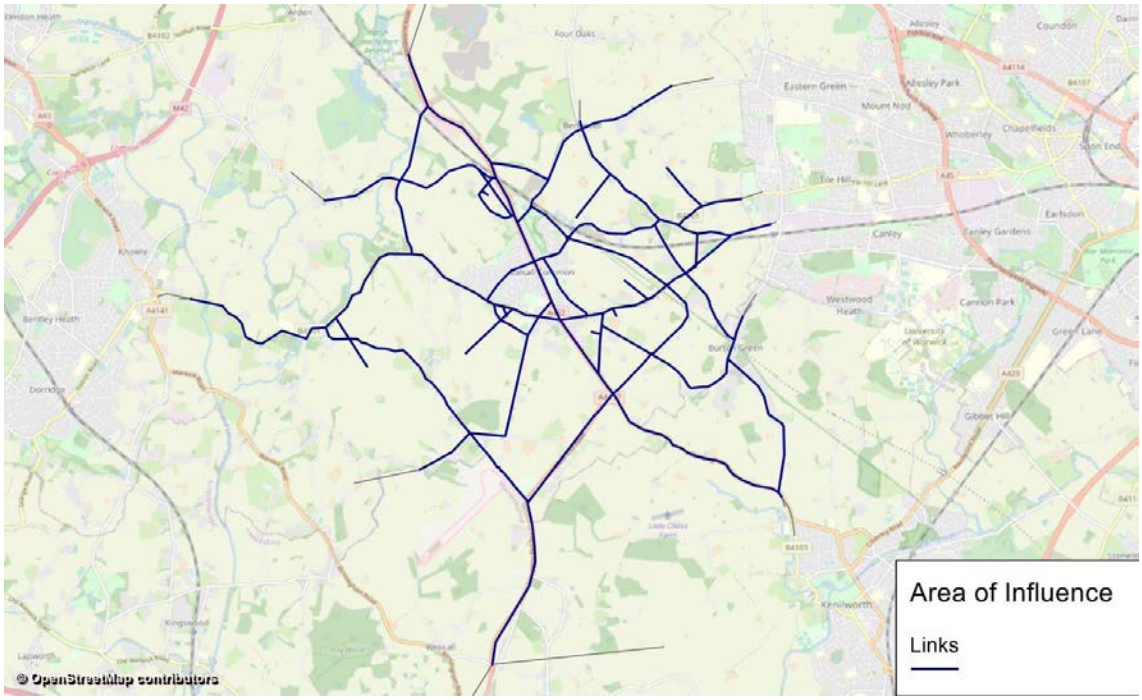
5.4.3 Wider Objectives

- Improve the resilience of Solihull's transport network.
- Enable housing growth by opening land for development.
- Improve accessibility to existing as well as proposed employment and services.
- Enhance the permeability and local connectivity of sustainable access modes.
- Encourage more walking, cycling and public transport trips (to improve the environment, people's health and wellbeing and their access to education, skills, employment, healthcare, retail and leisure opportunities).

5.5 Define geographic area of impact

The geographic scope of the area of impact is shown in Figure 5.1. This includes the A452 and the borough of Balsall Common. The geographic scope is defined by where the change in flows is expected to be the greatest and where the subsequent congestion and capacity affects the network.

Figure 5.1: Area of Impact



Source: Mott MacDonald / PRISM

6 Non-highway option development

6.1 Introduction

This section details the development a 'non-highway' set of transport interventions to help mitigate the additional travel demand from the proposed Draft Local Plan developments. These 'softer' measures have been developed with the assumption that the Balsall Common link road will be built and the two will be complementary.

6.2 Background

6.2.1 Public Transport

The public transport connecting Balsall Common to the wider Solihull area, and Berkswell Station could be improved. The limitation of public transport connectivity could be an influence in the number of car trips on the network.

6.2.2 Bus

The bus services currently frequenting Balsall Common and Berkswell do not provide succinct connections to Solihull and wider public transport services. Balsall Common is disconnected from the bus network, causing severance in the potential for multi-modal public transport trips across the network.

A quick win could be to improve the connectivity with Berkswell Station and Balsall Common. This additional public transport link could enable a larger proportion of people to get the train towards Birmingham and London.

Balsall Common doesn't have a consistent bus service, connecting the area to Solihull, Birmingham and Coventry, which could remove several shorter distance car trips on the network, and additionally potentially longer distance trips. Connecting Balsall Common to Solihull, via a frequent bus service, would connect the area to the proposed SPRINT service. The SPRINT is developed by Transport for West Midlands (TfWM), connecting Solihull to Birmingham and the airport.

SMBC will seek to use funding for the Balsall Common Transport package to address user confidence in the bus services, build a cohesive image, plug gaps in the bus network – for example to the University of Warwick, improve frequencies, reduce journey times and provide funding to improve bus stops and bus shelters in the Balsall Common area – for example by providing a real time information system.

6.2.3 Rail

Berkswell Station is a two-platform station, with trains which operate in both directions twice an hour throughout the day, both towards London, Coventry and Birmingham.

At the current time it is not feasible to increase the frequency of trains that stop at Berkswell Station, due to the level of capacity the line is currently operating at. However, it will be easier to deliver an improved rail service for the community after High Speed Two has opened. Solihull Council continues to lobby for this and the new West Midlands Rail Strategy, which will be led by the West Midlands Rail Executive offers an opportunity to stake a claim for an improved rail services.

In the meantime, improved station facilities can be brought forward that will make the rail service more attractive to users and the station more welcoming. In particular, Berkswell station does not have a direct, step free route from platform to platform.

6.2.4 Active Travel

There are several opportunities to improve the level of active travel within Balsall Common and focus on sustainable travel.

SMBC are developing a Local Cycling and Walking Infrastructure Plan (LCWIP), which will solidify the current proposed non-highways strategy proposed here.

Solihull Connected was published in 2016, and one of the main objectives is to "support and enable the integrated delivery of sustainable and efficient forms of transport like mass-transit, cycling and walking. A household travel survey in 2011, showed that 57% of all daily trips in Solihull are shorter than 5km in length, which is a walkable and cyclable distance, this equated to 320,000 trips each day. There is the potential to switch 10% of the commuter trips to cycling, would raise cycling participation by nearly 50,000 trips.

There could be the potential to extend the current cycleways in Balsall Common and connect the village to the wider Solihull area. This additional connectivity will enable shorter trips and commuter trips to be moved from private car. In addition, opportunities will be taken by SMBC to install high quality cycle parking at health, education, leisure, employment, retail and transport points in Balsall Common.

6.2.5 Reducing Speed on Balsall Common High Street

Reducing the speed through the centre of Balsall Common would encourage a larger proportion of active travel through the borough.

An example of speed reducing in Balsall Common is Kenilworth Road, with the development access points on Drovers Close. A narrowing of the road lanes, providing a small paved central reservation, reduces the speed of the road, and reduce the number of vehicles overtaking and increasing the speed on the road. This measure enables more vehicles to join the A452, without a large delay. The slower speed on the road would also encourage cycling along the network. However, this measure could also be used to encourage walking, where there is pre-existing walking infrastructure can be upgraded.

6.3 Approach to delivery

6.3.1 Vision and Validate

Following the COVID-19 pandemic, there has been a greater focus on shift from the predict and provide methodology, to a vision and validate. The predict and provide methodology has been increasingly questioned, alongside the greater uncertainty of the results. The vision and validate methodology should start with the UK cities developing visions, and the methodology should start with these outcomes and then understand the investments that can justify this.

There have been emerging issues with the predict and provide methodology, with infrastructure alone not managing the increasingly heavy congestion on road networks. There is an increasing emphasis on a shift in model splits and improving the public transport capabilities. However, this is still based on forecasting the future and providing for this, but trends are difficult to predict, as highlighted by the pandemic.

This approach focuses on developing a comprehensive future vision, and then identify what role transport should contribute to delivering the vision, through major investments and regulatory measures. This validate approach, then focuses on the determining what future set of conditions the proposed would provide good value for money.

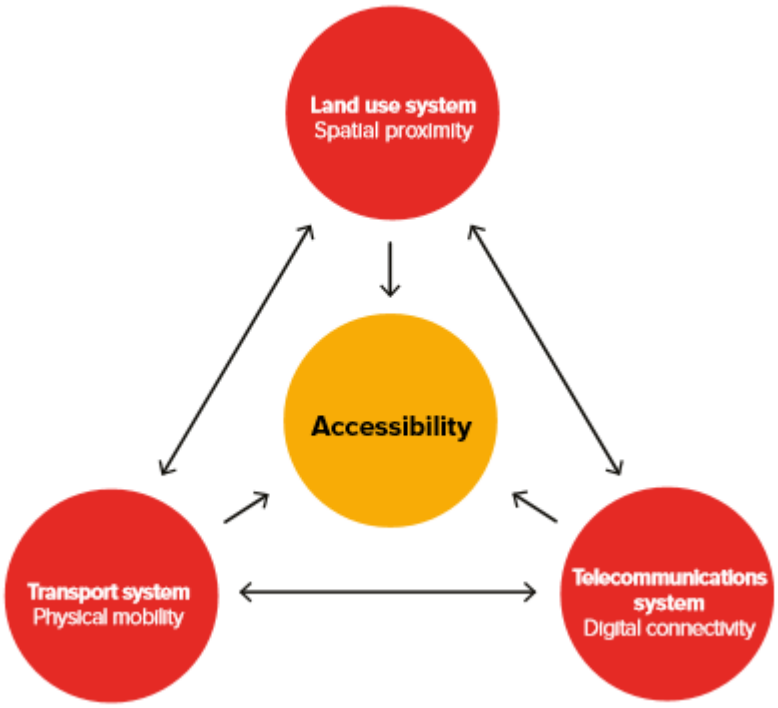
6.3.2 FUTURES

FUTURES is an uncertainty tool kit, which has been developed by Mott MacDonald in collaboration with University West of England (UWE), and is based on understanding the drivers of change, and key uncertainties and assess which scenario is most resilient in the future.

Trends in Transport Planning are not as certain as they used to be, and the singular comparison against a set Do Minimum Scenario does not provide an accurate reflection, as trends including economic growth and increase in vehicle movements have de-coupled.

A potential future for transport planning is to provide a key characteristic of the future of the borough, and focus on a triple access planning, shown below in Figure 6.1. The drivers of change need to be assessed with a level of uncertainty and importance, to understand the impact that they can have on the delivery of the transport package.

Figure 6.1: Triple Access Planning Framework



Source: Mott MacDonald

6.4 Proposals

Through the development of this study, the following non-highway based principles have been developed using the Vision and Validate approach (as described in Section 6.3).

Figure 6.2 shows the location of the proposed active travel corridors, traffic calming and Core Walking Zone links.

Figure 6.2: Proposed Non-Highway Option

Source: Mott MacDonald

6.4.1 Active Travel Corridors

Additional Active Movement links have been proposed within the village, to improve connectivity between the proposed development sites, the High Street and Berkswell Station.

From Figure 6.2 above, it is shown that Meeting House Lane, Balsall Street East, Station Road, Lavender Hall Lane, and Hallmeadow Road have been highlighted as key connectors within Balsall Common.

Through introducing additional connectivity between developments and key centres of Balsall Common, shorter distance vehicle trips should be removed from the network.

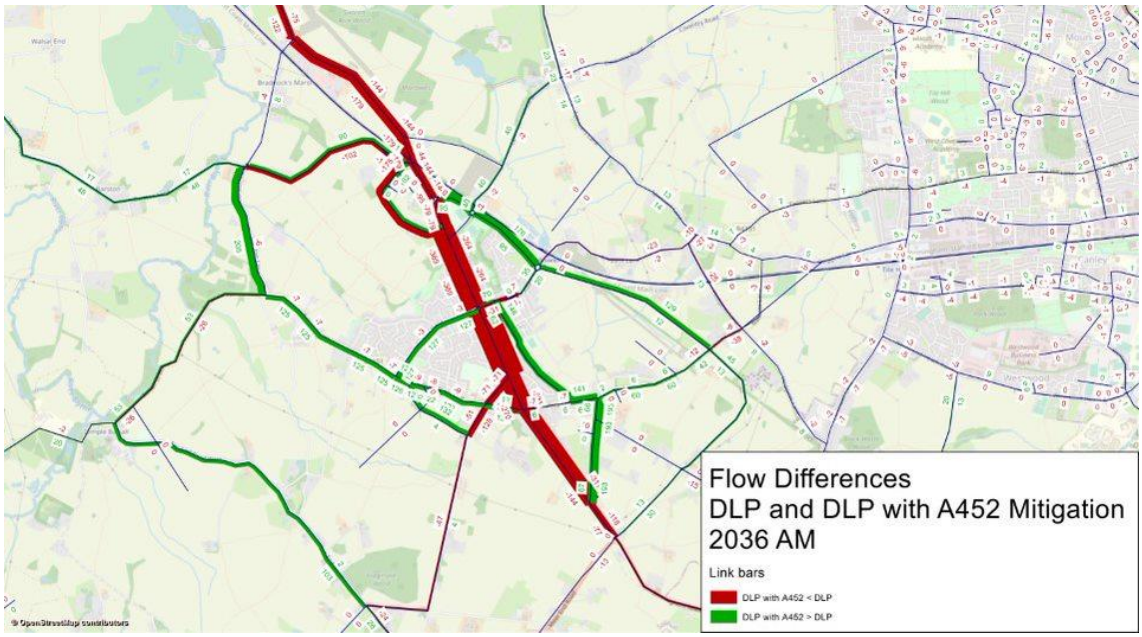
6.4.2 Traffic calming and speed reduction on A452

Through developing the non-highway mitigation proposals, reducing the speed on the High Street to 20mph was additionally modelled within PRISM. Speed reduction along the High Street should reduce traffic through the centre of the village and make enable the High Street to become more desirable.

Figure 6.3 below shows the difference in traffic flows within Balsall Common with a speed reduction to 20mph from Hallmeadow Road to Station Road. Note that this is including the new

link road. From the figure it is clear reducing the speed of the A452 is successful in removing traffic from the High Street. The PM plot is displayed in Appendix C.

Figure 6.3: DLP High Street Speed Reduction, 2036 AM



Source: Mott MacDonald

6.4.3 Core Walking Zones

In addition to developing active travel routes within the village, a series of core walking zones could be introduced. Figure 6.2 shows the length of the A452 from Hallmeadow Road to Windmill Lane has been dedicated as a core walking zone, along with key routes from it.

These additional links include Station Road East and West, Gipsy Lane, Holly Lane, Kelsey Lane and Waste Lane. These additional links provide connections between the proposed development sites, and a safer environment for pedestrians which will encourage more walking trips and a reduction in vehicle trips across the network.

The improvements on each link would include:

- Footway improvements
  - Widening
  - Dropped kerbs
  - Tactile paving
- Additional public seating
- Wayfinding
- Improved signage (with the inclusion of journey times)

Through improving and amending the pedestrian environment, shorter distance vehicle trips could be replaced by foot, and sustainable connections at Berkswell Station could improve.

6.5 Summary

These non-highway measures have the potential to reduce the number of private car vehicle trips in the borough. These options will be assessed and sifted using INSET to establish the best combination of measures to help mitigate the additional transport demand with the proposed developments. A summary of the options discussed can be found below.

- Potential to increase in bus connectivity to Solihull and Birmingham City Centre, making use of the additional SPRINT services.
- Reduce speed along the High Street, to reduce focus on vehicle movements and accommodate active travel measures – this will incorporate placemaking principles
- Investment in future mobility options to invest in a cleaner and more seamless transport future
- At the current time it is not feasible to increase the frequency of trains that stop at Berkswell Station, due to the level of capacity the line is currently operating at. However, it will be easier to deliver an improved rail service for the community after High Speed Two has opened. Solihull Council continues to lobby for this and the new West Midlands Rail Strategy, which will be led by the West Midlands Rail Executive offers an opportunity to stake a claim for an improved rail services.
- Improve pedestrian and cycle access to Berkswell Station, removing the disconnect with Balsall Common centre, and enabling a safe and segregated route.

7 Initial option assessment

7.1 Introduction

In order to identify an appropriate intervention to achieve the study objectives, a multi-layered option assessment process is required. This Technical Note presents the option assessment methodology and the Stage 1 results.

The Transport Appraisal Process for a transport intervention such as that being considered for Balsall Common can be undertaken in a three-step framework of Multi-Criteria Assessment (MCA):

- **Stage 1** - Appraising a range of strategic level solutions (rather than specific interventions) including all transport modes, managing demand as well as the option to do nothing. The result of this stage is to identify which strategic approaches should be focused on in the remainder of the appraisal.
- **Stage 2** - Undertaking a long-listing exercise identifying as many feasible options which fall under the preferred strategic approach, then assessing those options against the criteria to lead to a shortlist.
- **Stage 3** - Further assessment of the shortlisted options to identify a set of preferred options to take forward for further assessment.

The content of the previous reports highlights that the fundamental transport issues are caused by available capacity outweighed by excess demand in the local area. Strategic solutions should therefore be seeking to introduce additional capacity, reduce the demand on the network or a combination of the two.

At Stage 1, a range of strategic level solutions can be drawn from all transport modes and methods of managing demand.

The outcome of Stage 1 will provide one or more selected strategic solutions which have been assessed as providing the best opportunity for meeting the scheme objectives and resolving the identified transport problems. The list of solutions has been identified below:

Table 7.1: Stage 1 - Strategic Solutions

	Strategic Option	Description
1	Do nothing	No interventions are necessary, the existing conditions on and around the A452 are appraised as they are.
2	New / improved bus services	Provide more bus services on the A452 and on smaller roads in and around the Balsall Common area.
3	Increased rail frequencies	Increase services from Berkswell, Hampton in Arden and Tile Hill railway stations.
4	Demand management	Implement / increase parking charges around Balsall Common and the A452.
5	Park & Ride	Install Park and Ride sites at Berkswell Station.

	Strategic Option	Description
6	Online highway	Improve the existing highway infrastructure.
7	Offline highway	Invest in the construction of a new A452 Link road.
8	Traffic management	Implement effective road closures / one-way systems which do not worsen the level of traffic congestion elsewhere in the area. Also apply Traffic Regulation Orders to restrict the types of vehicles able to route through the area.
9	Bus Priority Lanes	Install bus priority lanes to improve bus journey times and local connectivity.
10	Active Travel	Install active travel provision to support other investment options. E.g. One-way cycleway and one-way bus provision or improving the footways for pedestrians.

Source: Mott MacDonald

7.2 Multi-criteria assessment methodology

The MCA framework used in evaluating the potential solutions and options is Mott MacDonald's in-house Investment Sifting and Evaluation Toolkit (INSET). INSET is scalable and flexible tool that can be adapted for any stage of the scheme business case development process to help decision makers manage information on investment options and evaluate them across multiple criteria. It provides a clear and transparent audit trail to demonstrate how selected schemes have been prioritised or selected for further scheme development and enables a wider conversation around the merits of individual schemes or investment decisions. For other studies, INSET has been used in stakeholder engagement sessions, transport committee meetings and in peer review settings to illustrate how robust decisions have been arrived upon.

INSET functions through undertaking a scoring assessment of multi-criteria options which could include social, economic or environmental indicators of scheme performance. Assessment criteria are commonly defined as measurable elements that can be linked to an evidence base. Based on the detail of the data provided, a scoring framework is developed through which each of the criteria can be appraised. This can range from a simple "yes/No" query (e.g. does this scheme pass through a residential area?) to a more quantified response based on scoring bands (e.g. how much greenbelt land would need to be used for this intervention?)

7.3 INSET Themes

For the assessment of the Balsall Common Stage 3 Study, the following themes have been set following a review of the study aims and objectives and prevailing local and national policy.

- Transport benefits
- Wider economic benefits
- Environmental impacts
- Social impacts
- Alignment with objectives
- Deliverability

Underpinning the assessment of these themes are structured main and sub-criteria. The number of criteria changes depending on the stage of the assessment as the level of detail and appraisal increases**.** Appendix A provides the incremental evolution of the criteria used for assessment at each stage of optioneering.

7.4 Option scoring

INSET allows for a variety of scoring mechanisms which can be tailored to suit specific criteria. For example, environmental impacts may be scored on a 5-point or 7-point scale from large negative being the lowest score and large positive the highest score. Alternatively, an option's fit to local policy may range from 0-5 where 5 is a strong fit. Some criteria may simply have a yes or no answer. INSET not only allows for various methods to be used within the same framework, but can also 'normalise' all scores to allow the different mechanisms to be treated in the same way.

7.5 Stage 1 - Weighting

INSET allows criteria to be weighted depending on their importance to the overall assessment.

In line with key national and local policy, transport benefits have been treated as the most important factor along with wider economic benefits: specifically, the ability to provide additional capacity and therefore facilitate and mitigate growth. Therefore, both categories have been given a weighting of two, whereas all other categories are weighted as one. Additionally, within the deliverability category, the complexity score has been deemed twice as important as the estimated costing of the scheme. The deliverability category weighting has remained at one.

7.6 Stage 1 – Initial Sifting

Table 7.2 summarises how the strategic solutions scored against the six assessment themes. Whilst a 'Do Nothing' scenario has been included within the assessment, it is used as a baseline against which to compare the other solutions. As such, its performance will not be commented on as it will clearly fail to resolve the known transport problems.

Within the table, 'Very Good' describes criteria which the scheme fully meets. 'Good' describes the criteria that a scheme mostly provides benefit to, where the positives outweigh the negatives. 'Neutral' describes the criteria that the scheme does not impact. 'Low' describes criteria where the negatives outweigh the positives whilst 'Very Low' indicates that there are no positives to the scheme.

Table 7.2: INSET Stage 1 Comparison of strategic solution scores (in order of rank)

Rank	Scheme	Transport Benefits	Wider Economic Benefits	Environment	Social Impacts (Quality of Life)	Alignment with Objectives	Deliverability
1	Offline highway	Very Good	Very Good	Very Low	Neutral	Low	Very Good
2	Active Travel	Good	Very Low	Neutral	Neutral	Very Good	Very Good
3	Online highway	Good	Very Good	Very Low	Neutral	Very Good	Very Good
4	Increased rail frequencies	Neutral	Very Good	Neutral	Neutral	Low	Low
5	New/ improved bus services	Neutral	Very Low	Neutral	Neutral	Low	Very Good
5	Park & Ride	Neutral	Very Low	Neutral	Neutral	Neutral	Good
7	Bus Priority Lanes	Very Low	Very Low	Neutral	Neutral	Low	Very Good
8	Traffic management	Very Low	Very Low	Very Low	Neutral	Very Low	Very Good

9	Demand management	Very Low	Very Low	Very Low	Very Low	Very Low	Very Good
10	Do nothing	Very Low	Very Low	Very Low	Very Low	Very Low	Very Good

Source: Mott MacDonald

Table 7.3 provides the scoring attributed to each.

Table 7.3: INSET Stage 1 - Strategic solution Scores (order of rank)

Rank	Scheme	Transport Benefits	Wider Economic Benefits	Environment	Social Impacts (Quality of Life)	Alignment with Objectives	Deliverability	Total Score
1	Offline highway	1.00	2.00	-0.50	0.50	0.25	0.75	0.67
2	Active Travel	0.67	0.00	0.50	0.50	0.75	1.50	0.65
3	Online highway	0.67	1.00	-0.50	0.50	0.75	0.88	0.55
4	Increased rail frequencies	0.33	1.00	0.50	0.50	0.25	0.13	0.45
5	Park & Ride	0.33	0.00	0.50	0.50	0.25	0.88	0.41
6	New/ improved bus services	0.33	0.00	0.50	0.50	0.50	0.63	0.41
7	Bus Priority Lanes	0.00	0.00	0.50	0.50	0.25	1.00	0.38
8	Traffic management	0.00	0.00	0.00	0.50	0.00	1.50	0.33
9	Demand management	0.00	0.00	0.00	-0.50	0.00	1.00	0.08
10	Do nothing	0.00	0.00	-0.50	-0.50	-1.00	1.50	-0.08

Source: Mott MacDonald

Transport Benefits

Offline highway and to a lesser extent, online highway and active travel are shown to be most effective at providing transport benefits whilst it is felt that bus priority lanes, traffic management and demand management will have the least impact due to the failure to result in mode shift and an improvement in the operation of the network. Do nothing is the worst performing option overall.

Wider Economic Benefits

For the Wider Economic Benefits theme, the assessment concludes that offline highway will have the highest impact through its ability to mitigate for planned or future growth. Aspirations to deliver growth may come forward quicker with offline improvements that provide access to land.

Environment

Active travel, bus priority lanes, Park & Ride, new/improved bus services and increase rail services all have positive environmental benefits, whilst offline and online highway schemes have negative environmental impacts. Traffic management and demand management have a neutral environmental impact as the scale of the proposed intervention will cause minimal

change to the environment. The Do Nothing option also has a neutral impact as the intervention itself will not directly have a positive or negative impact on the environment.

Quality of Life

All schemes are expected to have a positive impact on quality of life, apart from demand management which will be costly to the user and will unfairly disadvantage those on lower incomes.

Alignment with Objectives

Active travel is the scheme that is most in line with the objectives, due to the fact it should lead to greater take-up of sustainable modes, having positive benefits to public health. Traffic management and demand management do not align to any of the objectives in a significant way.

Deliverability

All schemes have been scored highly for deliverability except for rail services. At the current time it is not feasible to increase the frequency of trains that stop at Berkswell Station, due to the level of capacity the line is currently operating at. However, it will be easier to deliver an improved rail service for the community after High Speed Two has opened. Park & Ride has also scored less favourable largely due to the complexity and cost. Affordability, therefore, is one of the key factors that has been used to compile the overall deliverability scores.

Summary

An offline highway scheme comes out with the highest overall benefits. It is expected to provide benefits in all categories apart from the environment. This will be considered at the following stage. Active travel and online highway also score highly. It is worth noting that whilst rail and bus priority scores fairly well, it is deemed to present very low local transport benefits: whilst bus lanes may improve journey time for passengers, there is not likely to be a significant enough increase in patronage to have an impact on congestion. Additionally, the introduction of bus priority lanes likely means a reduction in traffic lanes, which would lead to increased congestion in some areas which would not solve the problem assessed in this report. Furthermore, any improvements to bus services are unlikely to result in the necessary modal shift to reduce congestion.

Whilst an active travel scheme has positive implications, it would have no large impact on existing congestion or have the ability to provide additional capacity for future development. Instead, active travel should be considered alongside a scheme which will also improve capacity, forming an ‘option package’.

7.7 INSET Stage 1 Conclusion

The conclusions of the initial sifting of the strategic solutions are provided in the table below along with a decision on whether they should pass to the next stage of the assessment.

Table 7.4: INSET Stage 1 - Strategic solution summary

Option	Scheme	Pass/Fail	Summary
A	Do nothing	Fail	The existing problems with congestion and delay will remain No additional capacity will be created Air quality in the area will continue to be affected Drivers will still have to sit in congestion No immediate costs
B	New/ improved bus services	Fail	Could lead to slight increase in patronage Minimal impact on capacity and reduction in emissions Provides sustainable alternative for local residents Can be costly and complex to implement
C	Increased rail frequencies	Fail	Could lead to slight increase in patronage Minimal impact on capacity and reduction in emissions Provides sustainable alternative for commuters to/from the area Possible changes to signals
D	Demand management	Fail	Congestion and delay could be shifted elsewhere if road charges were implemented The relative impact on overall congestion and emissions would be minimal Cause of economic disparity Reasonably low cost
E	Park & Ride	Fail	Would likely lead to a small increase in capacity The correct location could improve accessibility of new development Potentially small reduction in emissions Can be costly and complex
F	Online highway	Pass	Would provide some reduction in congestion and increase capacity slightly Minimal positive environmental impacts Can be delivered more easily than offline highway improvements
G	Offline highway	Pass	Could significantly reduce localised congestion and improve capacity Minimal positive environmental impacts Could be implemented with sustainable measures Costly and complex to implement
H	Traffic management	Fail	Could have a negative impact on congestion and capacity overall Could locally improve air quality and noise pollution, but have a negative impact elsewhere Potentially improving the local area for residents Low cost
I	Bus Priority Lanes	Fail	Reduce journey time for passengers Limited potential to result in mode shift Potentially reduce traffic lanes, therefore increasing congestion in some areas Provides sustainable alternative for local residents Limited available highway land/ costly to acquire the land
J	Active Travel	Pass	Improve local connectivity Minimal impacts on congestion and air quality Sustainable alternative, health benefits Can be implemented alongside another scheme, therefore reasonably low cost

Source: Mott MacDonald

8 INSET Stage 2: Longlist

8.1 Sifting - Stage 2

A long list of eight offline highway alignments, as well as an online highway (strategic level) and non-highway intervention have been identified for the second appraisal stage. All options are described in Table 2.1 with detailed drawings provided in Section 8.2 and in Appendix B. Cross sections of the designs can be found in Section 8.2.11.

Highway design in the UK is typically undertaken in accordance with Volume 6 of the Design Manual for Roads and Bridges (DMRB) which includes a suite of design standards for design of all-purpose trunk roads. DMRB can, and often is, applied to local authority roads but is not always applicable to built-up urban areas which are more appropriately categorised as Streets.

Manual for Streets 2 (MfS2) is the companion guide to the Department for Transport's (DfT) Manual for Streets (MfS), which focuses on lightly trafficked and residential streets. Because of this, MfS2 was published with DfT's endorsement to show how the key principles of MfS can be applied to busier streets and non-trunk roads. Other relevant design standards can also be applicable including the DfT's suite of Traffic Signs Manuals.

With a broad range of design standards and guidance available, it is important to establish the relevant and applicable aspects of each standard, such that the compliance of the design can be understood and appropriately assessed and considered. To this end we have developed a number of alignments based on these two design standards as described in the subsequent sections below.

Table 8.1: INSET Stage 2 - Longlist scheme summary

Option	Scheme	Description
1	Non-highways based option	Public realm improvements Active Travel and Core walking zone improvements Traffic calming 20mph zone Improved active travel connections to Berkswell Station
2	Online highway	Local Junction improvements at impacted junctions
3	Alignment 1 Single carriageway (30mph)	Construction of new link road 30mph DMRB standard Avoids property on Waste Lane Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at Meer End Road junction or north of junction
4	Alignment 1 Single carriageway (50mph)	Construction of new link road 50mph DMRB standard Avoids property on Waste Lane Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction

Option	Scheme	Description
5	Alignment 1 Dual carriageway (50mph)	Construction of new link road 50mph DMRB standard (with central res) Dual carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction
6	Alignment 2 Single carriageway (30mph)	Construction of new link road 30mph DMRB standard Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction
7	Alignment 2 Single carriageway (50mph)	Construction of new link road 50mph DMRB standard Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction
8	Alignment 2 Dual carriageway (50mph)	Construction of new link road 50mph DMRB standard (with central res) Dual carriageway Shared cycleway/footway New junction required on Waste Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction
9	MfS 1 - Single carriageway (30mph)	Construction of new link road 30mph Manual for Streets (MfS) approach Likely to form access point to DLP development Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction
10	MfS 2 - Single carriageway (30mph)	Construction of new link road 30mph Manual for Streets (MfS) approach Likely to form access point to DLP development Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction

Source: Mott MacDonald

8.2 Longlisted schemes

8.2.1 Non-highways based option

Figure 8.1 shows the non-highway option. This non-highways strategy proposal is summarised as:

- Public realm improvements
- Active Travel and Core Walking Zone improvements
- Traffic calming, reduced speed limits and 20mph zone
- Improved active travel west-east connections to Berkswell Station

Figure 8.1: Proposed Non-Highway Option

Source: Mott MacDonald

8.2.2 Online highway (strategic level)

No local highway improvement schemes have been developed for this report, given the constraints of the existing junctions and level of impact from DLP development. At the strategic level, online highway improvements would broadly look at improving the existing local highway infrastructure and provide additional capacity where possible.

8.2.3 Alignment 1 Single carriageway (30mph)

Figure 8.2 shows the Alignment 1 single carriageway option designed at 30mph. This is summarised as:

- Alignment avoids land and property at northern end of Waste Lane
- 30mph design speed
- DMRB design standard
- Single Carriageway Type
- Active travel link

Figure 8.2: Alignment 1 Single carriageway (30mph)

Source: Mott MacDonald

8.2.4 Alignment 1 Single carriageway (50mph)

Figure 8.3 shows the Alignment 1 single carriageway option designed at 50mph. This is summarised as:

- Alignment avoids land and property at northern end of Waste Lane
- 50mph design speed
- DMRB design standard
- Single Carriageway Type
- Active travel link

Figure 8.3: Alignment 1 Single carriageway (50mph)

Source: Mott MacDonald

8.2.5 Alignment 1 Dual carriageway (50mph)

Figure 8.4 shows the Alignment 1 dual carriageway option designed at 50mph.This is summarised as:

- Alignment avoids land and property at northern end of Waste Lane
- 50mph design speed
- DMRB design standard
- Dual Carriageway Type
- Active travel link

Figure 8.4: Alignment 1 Dual carriageway (50mph)

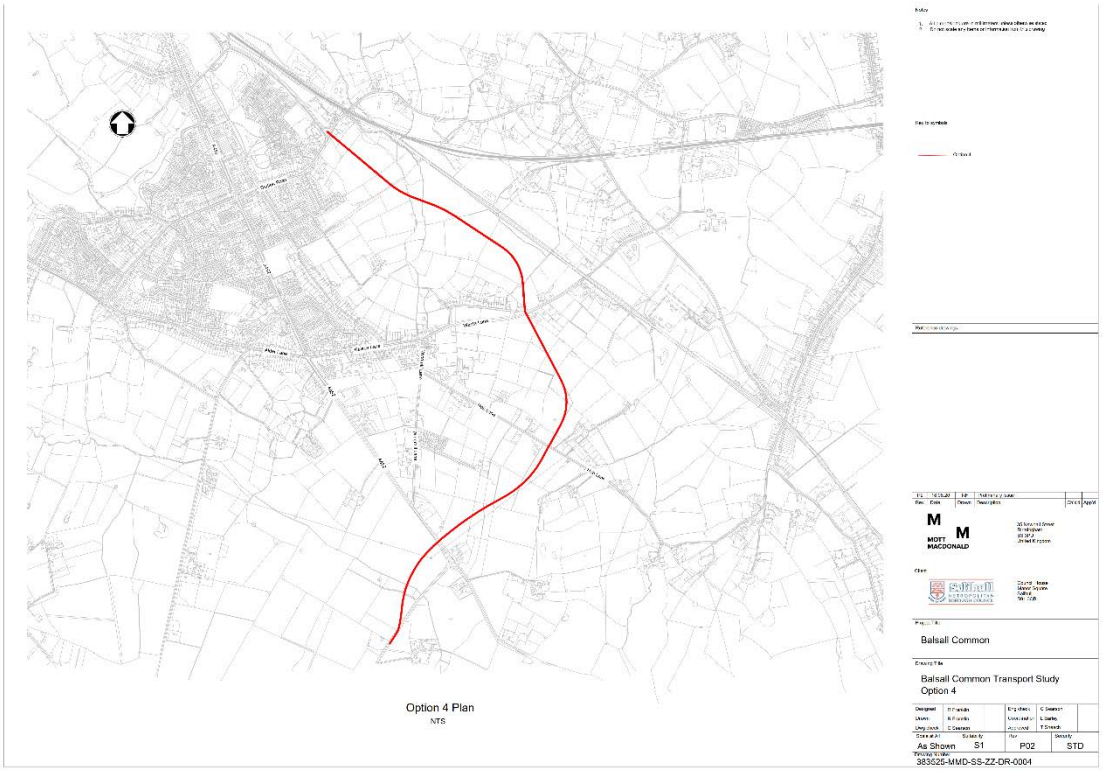
Source: Mott MacDonald

8.2.6 Alignment 2 Single carriageway (30mph)

Figure 8.5 shows the Alignment 2 single carriageway option designed at 30mph.This is summarised as:

- Alignment ties in further south on Waste Lane
- 30mph design speed
- DMRB design standard
- Single Carriageway Type
- Active travel link

Figure 8.5: Alignment 2 Single carriageway (30mph)



Source: Mott MacDonald

8.2.7 Alignment 2 Single carriageway (50mph)

Figure 8.6 shows the Alignment 2 single carriageway option designed at 50mph. This is summarised as:

- Alignment ties in further south on Waste Lane
- 50mph design speed
- DMRB design standard
- Single Carriageway Type
- Active travel link

Figure 8.6: Alignment 2 Single carriageway (50mph)

Source: Mott MacDonald

8.2.8 Alignment 2 Dual carriageway (50mph)

Figure 8.6 shows the Alignment 2 dual carriageway option designed at 50mph. This is summarised as:

- Alignment ties in further south on Waste Lane
- 50mph design speed
- DMRB design standard
- Dual Carriageway Type
- Active travel link

Figure 8.7: Alignment 2 Dual carriageway (50mph)

Source: Mott MacDonald

8.2.9 MfS 1 - Single carriageway (30mph)

Figure 8.8 shows the Manual for Streets single carriageway option 1 designed at 30mph. This is summarised as:

- Alignment is more flexible and avoids land and property at northern end of Waste Lane
- 30mph design speed
- Manual for Streets design standard
- Single Carriageway Type
- Active travel link

Figure 8.8: MfS 1 - Single carriageway (30mph)

Source: Mott MacDonald

8.2.10 MfS 2 - Single carriageway (30mph)

Figure 8.9 shows the second Manual for Street design option alignment at 30mph. This is summarised as:

- Alignment is more flexible and ties in further south on Waste Lane
- 30mph design speed
- Manual for Streets design standard
- Single Carriageway Type
- Active travel link

Figure 8.9: MfS 2 - Single carriageway (30mph)

Source: Mott MacDonald

8.2.11 Alignment design cross section

For reference, both single and dual carriageway options have been designed with the following cross sections in mind as shown in Figure 8.10 and Figure 8.11.

Figure 8.10: Single carriageway cross section

Source: Mott MacDonald

Figure 8.11: Dual carriageway cross section

Source: Mott MacDonald

8.3 Stage 2 - Criteria

Most scoring categories assigned at INSET Stage 2 are identical to those at INSET Stage 1. The key differences, as outlined in Appendix A, are that categories for the Wider Economic Benefits and Environment themes have been changed from generalised criteria to separate criteria which can be used to differentiate more between the options.

8.4 Stage 2 – Weighting

Changes were also made to the weighting of criteria. The three themes considered of most importance when evaluating the highways schemes on the long-list were Transport Benefits and Deliverability, with the Air Quality weighting higher at the sub-criteria level within the Environmental theme.

8.5 Stakeholder Meeting

In addition to further desktop assessment of the scheme options, a stakeholder meeting was held in August 2020 with SMBC officers covering multiple disciplines including planning, transport, environment and policy.

The initial sifting exercise and each of the longlisted options were explained to the stakeholders. They were then asked to provide opinion which would be considered within the scoring exercise and were asked if there were any further options which should be considered. The main points raised by the stakeholders were:

- Site 9 boundary change which makes utilising some of the land identified for residential development at Site 9 unavoidable, which may reduce housing allocation
- The need to avoid land take at Meer End Road Junction and extend alignment south.
- The potential complications of using privately owned land, particularly at the southern end
- The need to minimise impacts on the flood zones and HS2 construction
- Impact on flood risk zones
- Improving access to west-east connections to Berkswell station as part of opportunities to promote active travel
- Maintenance issues on the current network
- Opportunities to improve the A452 High Street and retail environment

8.6 INSET Stage 2 - Results

The final scoring for INSET Stage 2 can be found below in Table 2.2. All but two options were shown to have scored ‘Good’ or ‘Very Good’ in the Transport benefit theme, whilst all other option scored broadly neutral across all other themes.

In all options, the impact on the environment was ‘Very Low’. It is important to note that these scores are all pre-mitigation and any impact, regardless of size, on AQMAs or designated sites have been scored as ‘Very Low.

Table 8.2: INSET Stage 2 - Comparison of Longlist options scores (in order of rank)

Rank	Scheme	Transport Benefits	Wider Economic Benefits	Environment	Social Impacts (Quality of Life)	Alignment with Objectives	Deliverability
1	Non-highways based option	Neutral	Neutral	Neutral	Good	Good	Very Good
2	Alignment 1 Single carriageway (30mph)	Good	Good	Very Low	Low	Good	Very Good
3	Alignment 1 Single carriageway (50mph)	Very Good	Good	Very Low	Very Low	Good	Very Good
4	MfS 1 - Single carriageway (30mph)	Good	Good	Very Low	Low	Good	Very Good
5	Online highway	Good	Good	Low	Neutral	Good	Very Good
6	MfS 2 - Single carriageway (30mph)	Good	Good	Very Low	Low	Good	Very Good
7	Alignment 2 Single carriageway (30mph)	Good	Good	Very Low	Low	Good	Neutral
8	Alignment 2 Single carriageway (50mph)	Very Good	Good	Very Low	Very Low	Good	Neutral
9	Alignment 1 Dual carriageway (50mph)	Good	Good	Very Low	Very Low	Low	Very Low
9	Alignment 2 Dual carriageway (50mph)	Good	Good	Very Low	Very Low	Low	Very Low

Source: Mott MacDonald

Table 8.3: INSET Stage 2 - Scores (order of rank)

Rank	Scheme	Transport Benefits	Wider Economic Benefits	Environment	Social Impacts (Quality of Life)	Alignment with Objectives	Deliverability	Total Score
1	Non-highways based option	0.17	0	0.14	0.33	0.75	1.25	0.44
2	Alignment 1 Single carriageway (30mph)	1.33	0.5	-0.64	-0.33	0.5	1	0.39
3	Alignment 1 Single carriageway (50mph)	1.5	0.5	-0.64	-0.67	0.5	1	0.37
4	MfS 1 - Single carriageway (30mph)	0.83	0.5	-0.64	-0.33	0.5	1.25	0.35
5	Alignment 2 Single carriageway (30mph)	1.33	0.5	-0.64	-0.33	0.5	0.5	0.31
6	Alignment 2 Single carriageway (50mph)	1.5	0.5	-0.64	-0.67	0.5	0.5	0.28
7	Online highway	0.33	0.25	-0.17	0	0.25	1	0.28
8	MfS 2 - Single carriageway (30mph)	0.83	0.5	-0.64	-0.33	0.5	0.75	0.27
9	Alignment 1 Dual carriageway (50mph)	1.33	0.5	-0.69	-1	-0.5	0	-0.06
10	Alignment 2 Dual carriageway (50mph)	1.33	0.5	-0.69	-1	-0.5	0	-0.06

Source: Mott MacDonald

8.7 INSET Stage 2 Conclusion

A decision was made to take forward the top seven options to INSET Stage 3 for shortlisting appraisal. Further details of the scoring for those remaining options are explained below.

Table 8.4: INSET Stage 2 - Longlist summary

Option	Scheme	Pass/Fail	Summary	Scheme Description
1	Non-highways-based option	Pass	Improve local connectivity Minimal impacts on congestion and air quality Sustainable alternative, health benefits Can be implemented alongside another scheme, therefore reasonable low cost Traffic calming for Balsall Common high street	Public realm improvements Active Travel and Core walking zone improvements Traffic calming 20mph zone Improved active travel connections to Berkswell Station
2	Online highway	Fail	Not going to alleviate congestion given the scale of local plan development Not enough benefits to support objectives Would not support wider improvements on the A452 to improve the quality of environment	Local Junction improvements at impacted junctions
3	Alignment 1 Single carriageway (30mph)	Pass	Expected to re-assign traffic from local roads and therefore reduce congestion Enable additional road capacity to be released which allows mitigation for future growth The redistribution of traffic away from local roads will provide social and environmental benefits such as reducing severance and accidents, whilst also improving air quality	Construction of new link road 30mph DMRB standard Avoids property on Waste Lane Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalised roundabouts Link to A452 ties in at either Meer End Road junction or north of junction
4	Alignment 1 Single carriageway (50mph)	Pass	Expected to re-assign traffic from local roads and therefore reduce congestion Enable additional road capacity to be released which allows mitigation for future growth The redistribution of traffic away from local roads will provide social and environmental benefits such as reducing severance and accidents, whilst also improving air quality Severance impact slightly worse than 30mph	Construction of new link road 50mph DMRB standard Avoids property on Waste Lane Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction
5	Alignment 1 Dual carriageway (50mph)	Fail	Reduce area to the south of new road available for residential development Environmental implications with additional capacity could support unsustainable growth Large severance impact to residents Complex to deliver Scheme does not align with policy and scheme objectives Higher cost to install	Construction of new link road 50mph DMRB standard (with central res) Dual carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction

6	Alignment 2 Single carriageway (30mph)	Pass	Requires demolition of property on Waste Lane Potential Land take of residential property on Waste Lane Expected to re-assign traffic from local roads and therefore reduce congestion Enable additional road capacity to be released which allows mitigation for future growth The redistribution of traffic away from local roads will provide social and environmental benefits such as reducing severance and accidents, whilst also improving air quality	Construction of new link road 30mph DMRB standard Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hobb Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road north of junction
7	Alignment 2 Single carriageway (50mph)	Pass	Requires demolition of property on Waste Lane Potential Land take of residential property on Waste Lane Expected to re-assign traffic from local roads and therefore reduce congestion Enable additional road capacity to be released which allows mitigation for future growth The redistribution of traffic away from local roads will provide social and environmental benefits such as reducing severance and accidents, whilst also improving air quality	Construction of new link road 50mph DMRB standard Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction
8	Alignment 2 Dual carriageway (50mph)	Fail	Reduce area to the south of new road available for residential development Environmental implications with additional capacity could support unsustainable growth Large severance impact to residents Complex to deliver Scheme does not align with policy and scheme objectives Higher cost to install	Construction of new link road 50mph DMRB standard (with central res) Dual carriageway Shared cycleway/footway New junction required on Waste Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction
9	MfS 1 - Single carriageway (30mph)	Pass	Less likely to re-assign traffic from local roads but will still provide some level of additional capacity Potentially easier to deliver and avoid land-take Flexible design principles Less severance impacts and improved quality of environment Introduction of traffic calming/ self enforcing if residential area	Construction of new link road 30mph Manual for Streets (MfS) approach Likely to form access point to DLP development Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction
10	MfS 2 - Single carriageway (30mph)	Fail	Less likely to re-assign traffic from local roads but will still provide some level of additional capacity Option would impact upon dwellings, with potential land take Route could tie into Waste Lane further south than other options and still maintain character/ avoid land take Flexible design principles Less severance impacts and improved quality of environment Introduction of traffic calming/ self enforcing if residential area	Construction of new link road 30mph Manual for Streets (MfS) approach Likely to form access point to DLP development Single carriageway Shared cycleway/footway New junction required on Waste Lane and Hob Lane - assumed unsignalled roundabout Link to A452 ties in at either Meer End Road junction or north of junction

Source: Mott MacDonald

9 INSET Stage 3: Detailed option assessment

9.1 Development and assessment of options

Having established the options above as the highest scoring options in INSET Stage 2, these options were then subject to further review and appraisal. INSET Stage 3 assessed the options to establish a more detailed understanding of the likely impacts and deliverability of the scheme options.

The following additional assessment was undertaken:

- Feasibility designs for each option were produced in AutoCAD and converted for use in the infrastructure design software Infraworks from which construction quantities could be estimated.
- Meer End Road Junction has been explored in more detail with 3 highway design options being developed at this stage.
- The quantities were combined with estimates of scheme development and supervision costs to produce a total scheme cost for each option. Cost estimates can be found in Appendix D.
- The designs were tested as Do Something scenarios using the PRISM model for 2036 AM and PM peak hour.
- Consideration given to the environmental and social impacts of the redistribution of traffic caused by each option.
- Consideration given to the engineering complexity, planning constraints and likely public and stakeholder acceptability of each option based on the design.

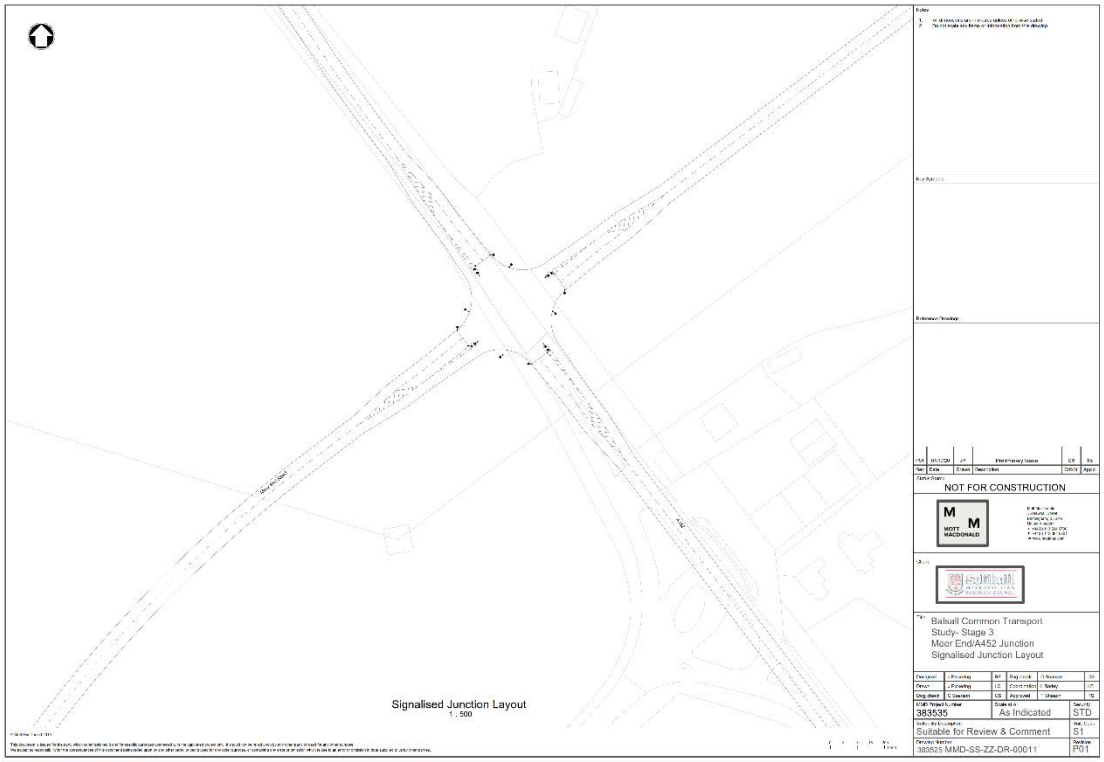
9.2 Meer End Road/ A452 Junction

Following further discussions with SMBC it was requested that additional design work was undertaken at the Meer End Road/ A452 junction. This was to understand the implications on the alignment extent south of the existing Meer End Road junction and the potential impact on land take. A decision was taken to avoid any potential impact on third party land at this location.

The following three junction designs in have been produced at concept level only. Figure 9.1 shows the signalised junction option, Figure 9.2 shows a staggered junction layout, and Figure 9.3 shows a roundabout option at Meer End Road.

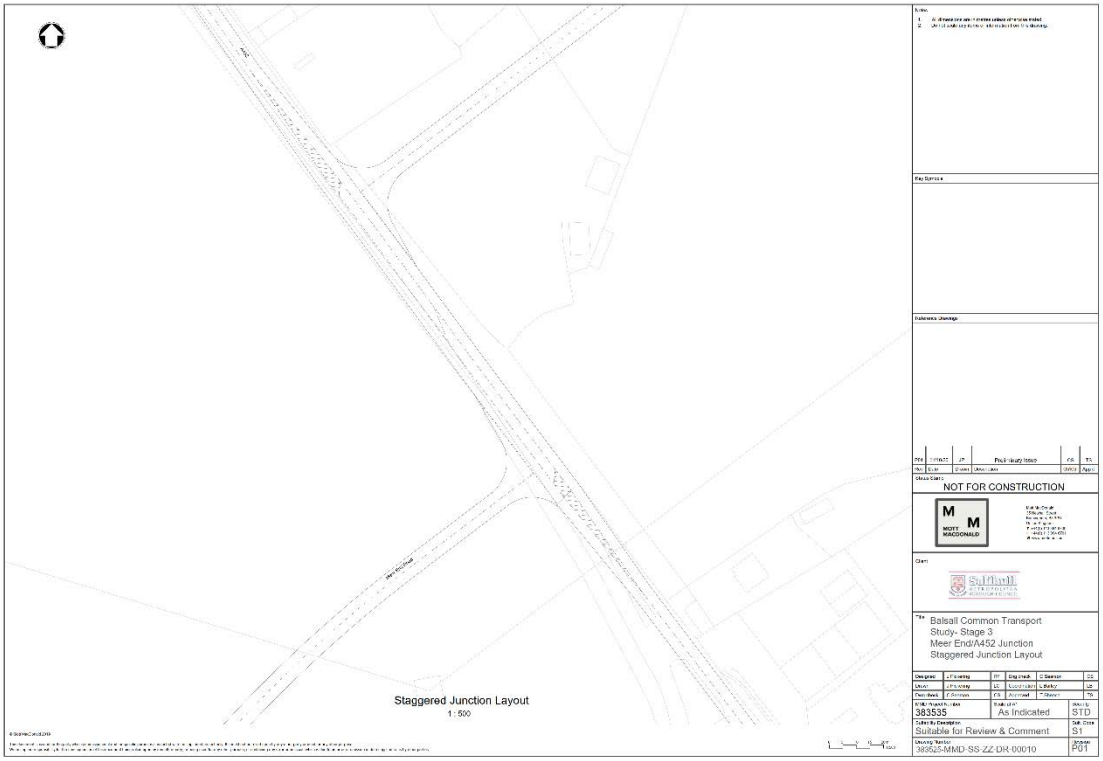
Further work would be required to determine which would be the optimal performer in terms of traffic operation and deliverability. Whilst it is likely the Meer End Road junction would require realignment or redesign; at this stage all 3 options could be delivered within the alignment options already developed in Stage 2.

Figure 9.1: Meer End Road/ A452 Signalised Junction Roundabout Layout



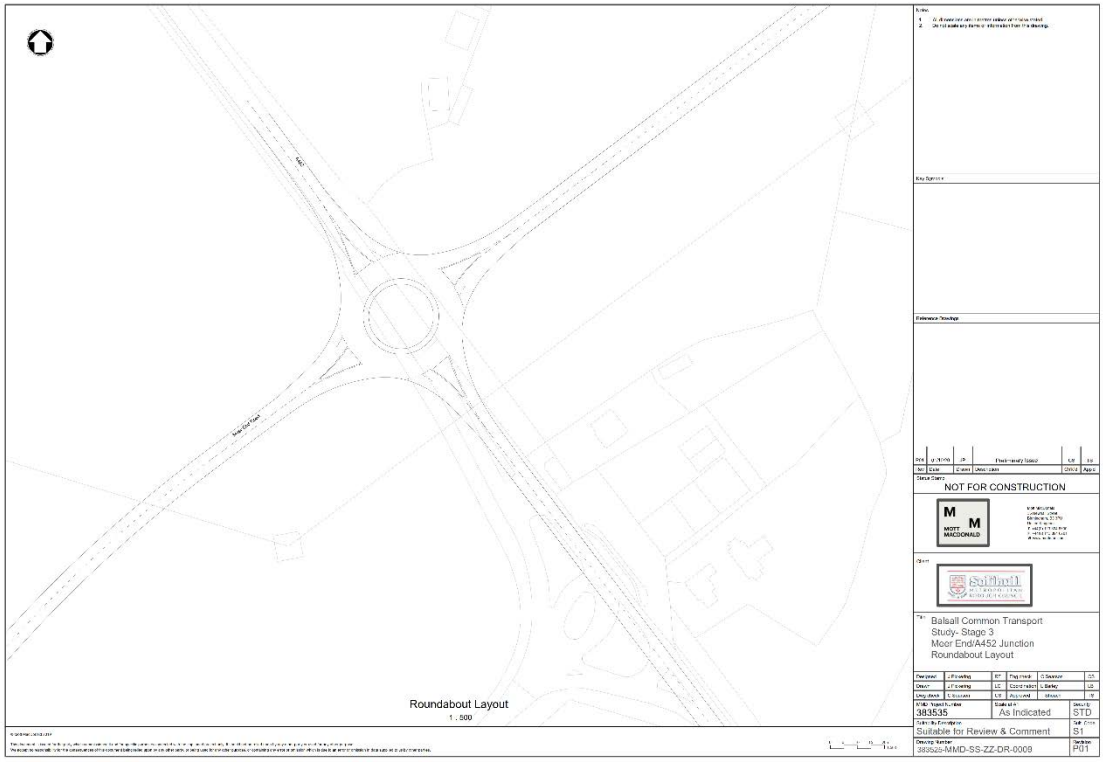
Source: Mott MacDonald

Figure 9.2: Meer End Road/ A452 Junction Staggered Junction Layout



Source: Mott MacDonald

Figure 9.3: Meer End Road/ A452 Junction Roundabout Layout



Source: Mott MacDonald

9.3 Stage 3 - Criteria

The scope of the scoring classifications for INSET Stage 3 has been widened to allow greater visibility in the scoring differences between the options, particularly for social impacts. This generates a greater variety of scoring categories in the INSET Stage 3 (Appendix A) scoring than in previous stages of appraisal.

9.4 Stage 3 – Weighting

Changes were made at Stage 3 to the weighting of criteria to match the scheme objectives as closely as possible. This brought deliverability and sustainable economic growth to the forefront and were given a higher weighting at the sub-criteria level. Weightings unchanged from Stage 2 were Transport Benefits was given a higher weighting at the Theme level with Air Quality unchanged at the sub-criteria level.

9.5 INSET Stage 3 - Results

Table 9.1 and Table 9.2 show a comparison of the results of the final INSET sifting exercise. Table 9.3 provides more detail on the qualitative and quantitative analysis, scoring narrative and rationale.

In summary, the two highest scoring options in INSET Stage 3 are Alignment 1 Single carriageway (50mph) and Alignment 1 Single carriageway (30mph). Both options perform well

across most themes including the transport benefits and deliverability themes. The 50mph design speed option provides a higher degree of transport benefits in terms of vehicle delay and journey times and is attractive to vehicles from the A452 as demonstrated in the transport modelling.

The Manual for Streets (MfS single carriageway 30mph) option, which broadly follows alignment 1 (avoiding land take and impact on property) scores relatively well across all criteria, but is less attractive to link road trips from the A452 and therefore delivers less transport benefits.

All offline highway alignments score very poorly in terms of environmental impacts, reflecting potential impacts on air quality and climate change.

Alignment 2 (both options) score poorly due to technical complexities with scheme delivery and potential stakeholder conflict and land take.

Option 1 (non-highways) scored well for transport benefits and social impacts. However, it fails to align with wider objectives and is not expected to deliver the level of economic benefit that the other options would generate if delivered in isolation. This could be delivered alongside a link road option, however.

Table 9.1: INSET Stage 3 - Comparison of shortlist options (in order of rank)

Rank	Scheme	Transport Benefits	Wider Economic Benefits	Environment	Social Impacts (Quality of Life)	Alignment with Objectives	Deliverability
1	Alignment 1 Single carriageway (50mph)	Very Good	Neutral	Very Low	Neutral	Neutral	Very Good
2	Alignment 1 Single carriageway (30mph)	Very Good	Neutral	Very Low	Low	Neutral	Very Good
3	Alignment 2 Single carriageway (50mph)	Very Good	Neutral	Very Low	Low	Neutral	Neutral
4	MfS 1 - Single carriageway (30mph)	Good	Neutral	Very Low	Low	Neutral	Very Good
5	Non-highways based option	Low	Very Low	Low	Neutral	Neutral	Very Good
6	Alignment 2 Single carriageway (30mph)	Good	Neutral	Very Low	Low	Neutral	Neutral

Source: Mott MacDonald

Table 9.2: INSET Stage 3 – shortlist options scores (in order of rank)

Rank	Scheme	Transport Benefits	Wider Economic Benefits	Environment	Social Impacts (Quality of Life)	Alignment with Objectives	Deliverability	Total Score
1	Alignment 1 Single carriageway (50mph)	1.33	0.5	-0.64	0.3	0.38	0.94	0.47
2	Alignment 1 Single carriageway (30mph)	0.86	0.5	-0.64	0.2	0.38	1.03	0.39
3	Alignment 2 Single carriageway (50mph)	1.33	0.5	-0.67	0.27	0.38	0.47	0.38
4	MfS 1 - Single carriageway (30mph)	0.72	0.5	-0.64	0.2	0.38	1.11	0.38
5	Non-highways based option	0.06	0	0.14	0.33	0.5	1.11	0.36
6	Alignment 2 Single carriageway (30mph)	0.72	0.5	-0.67	0.17	0.38	0.47	0.26

Source: Mott MacDonald

Table 9.3: INSET Stage 3: All themes narrative and scores

Theme		Non-highways based option	Alignment 1 Single carriageway (30mph)	Alignment 1 Single carriageway (50mph)	MfS 1 - Single carriageway (30mph)	Alignment 2 Single carriageway (30mph)	Alignment 2 Single carriageway (50mph)
Transport Benefits	Narrative	Whilst this would improve local connectivity from DLP sites and the wider area, a neutral score given overall. Active travel improvement would not provide any delay or improve journey times at network level.	Scheme shows some congestion alleviation benefits to the A452. Reduction in delay across local road network Local Plan site can be accessed Redistribution of traffic likely to result in an overall positive benefit	Highest reductions in flow on A452 Reduction in delay across local road network Capacity will improve on the road network and the local road network as choice of new routes is provided. Local Plan site can be accessed	Scheme shows limited redistribution of traffic Small reduction in delays across the local network Local Plan site can be accessed	Some reduction in delay across local road network Local Plan site can be accessed Redistribution of traffic likely to result in an overall positive benefit	Reductions in flow on A452 Reduction in delay across local road network Capacity will improve on the local road network as choice of new routes is provided. Local Plan site can be accessed
	Score	0.06	0.86	1.33	0.72	0.72	1.33
Wider Economic Benefits	Narrative	No impact on transport capacity and would not mitigate growth. Although no land will be unlocked for development improved connectivity	The new link can accommodate improved access to the DLP sites and mitigate residual traffic impacts	The new link can accommodate improved access to the DLP sites and mitigate residual traffic impacts	The new link can accommodate improved access to the DLP sites and mitigate residual traffic impacts	The new link can accommodate improved access to the DLP sites and mitigate residual traffic impacts	The new link can accommodate improved access to the DLP sites and mitigate residual traffic impacts
	Score	0.00	0.50	0.50	0.50	0.50	0.50

Theme		Non-highways based option	Alignment 1 Single carriageway (30mph)	Alignment 1 Single carriageway (50mph)	MfS 1 - Single carriageway (30mph)	Alignment 2 Single carriageway (30mph)	Alignment 2 Single carriageway (50mph)
Environment	Narrative	Slight benefit from overall air quality and reduced emissions from active travel and modal shift	**All offline highways schemes scored the same apart from Alignment 2, which scores slightly worse on Landscape and visual impact due to the impact on existing properties.** **Air Quality –** Overall there will be a general improvement in air quality in Balsall Common town centre with traffic re-assigning to the bypass. However, removing vehicles from the town centre introduces emissions in other areas which currently do not experience vehicle emissions, and is likely to increase travel distance. Road speed also impacts air quality. Higher speeds (50mph) result in more emissions and therefore reduce the benefits of removing stop-start traffic from the town centre. Smooth-flowing lower speed traffic (30mph) could potentially result in improved air quality. **Noise –** Overall there is likely to be an improvement in traffic noise levels in Balsall Common town centre. However, removing vehicles from the town centre to the link road introduces noise sources where there currently are none. In addition, the overall increase in traffic volumes will have a negative impact on the noise receptors located in Balsall Common. Noise levels from smooth-flowing lower speeds (30mph) could potentially result in reduced noise levels compared to an equivalent volume of traffic in the town centre. **Water –** The routes are situated in a primarily rural area with some urban settlements and a low speed road through the town centre. The alignment may have some positive impact on the townscape by reducing or removing the traffic travelling through the town centre. However, there will be a negative impact on the landscape and visual impacts with the construction of the road in a rural location. **Biodiversity –** Negative impact on biodiversity due to the loss of habitat and potential risk to protected species. There is a local nature reserve situated adjacent to the route, which would also be negatively impacted. The long, linear nature of the scheme may restrict mitigation options, as there is likely to be reduced scope for biodiversity net gain and replacement habitat. **Landscape/townscape and visual –** There will be a negative impact on the landscape and visual impacts with the construction of the road in a rural location. The routes may have some positive impact on the townscape by reducing or removing the traffic travelling through the town centre. **Land quality –** Overall there will be a loss of agricultural land, recreational land and biodiversity habitats. There will be an increase in contamination sources such as polluted run-off and litter along the undeveloped areas of the new routes. However, appropriate mitigation can be proposed for potential pollution. Overall land quality impacts are therefore assessed to be a minor negative. **Heritage –** There are a few listed buildings situated close to the route. There are likely to be minor impacts on the setting of current build heritage assets. The likelihood of impact is low or neutral. There is potential to negatively impact undiscovered buried archaeology as the routes currently cross undeveloped land. Potential impacts on undiscovered buried archaeology are assessed to be a moderate negative				

Theme		Non-highways based option	Alignment 1 Single carriageway (30mph)	Alignment 1 Single carriageway (50mph)	MfS 1 - Single carriageway (30mph)	Alignment 2 Single carriageway (30mph)	Alignment 2 Single carriageway (50mph)
			Climate change and carbon emissions – In the context of the climate emergency and Net Zero requirements, any increase in emissions is significant and negative. The proposals will result in construction stage emissions and the road materials will increase embodied carbon in the borough. Climate change and carbon emissions impacts are therefore assessed as a major negative.				
	Score	0.14	-0.64	-0.64	-0.64	-0.67	-0.67
Social Impacts	Narrative	Improved access to local amenities and services. Benefits to journey quality and accessibility. Likely to be a reduction in severance for NMUs.	Lower traffic flows on the High Street and A452 should reduce the prevalence of accidents. Traffic flows on A452 expected to be reduced, resulting in improved severance and positive social impacts.	Lower traffic flows on the High Street and A452 should reduce the prevalence of accidents. Faster journey times result in better access to services and amenities Lower traffic flows on A452 expected. This should result in improved severance and positive social impacts.	Lower traffic flows on the High Street and A452 should reduce the prevalence of accidents. Lower traffic flows on A452 expected. This should result in improved severance and positive social impacts.	Lower traffic flows on the High Street and A452 should reduce the prevalence of accidents. Lower traffic flows on A452 expected to be less at 30mph but should result in improved severance and positive social impacts.	Lower traffic flows on the High Street and A452 should reduce the prevalence of accidents. Faster journey times result in better access to services and amenities Lower traffic flows on A452 expected This should result in improved severance and positive social impacts.
	Score	0.33	0.20	0.30	0.20	0.17	0.27
Alignment with Objectives	Narrative	Positive fit with all wider objectives. This option should improve both physical and mental wellbeing following improved safety and severance	Scheme likely to provide some congestion alleviation benefits Potential for access to development DLP sites and will provide additional road capacity	The redistribution of traffic away from the local road network will encourage economic growth despite no new land	Scheme likely to provide some congestion alleviation benefits Potential for access to development DLP sites and will provide additional	Scheme likely to provide some congestion alleviation benefits Potential for access to development DLP sites and will provide additional	The redistribution of traffic away from the local road network will encourage economic growth despite no new land

Theme		Non-highways based option	Alignment 1 Single carriageway (30mph)	Alignment 1 Single carriageway (50mph)	MfS 1 - Single carriageway (30mph)	Alignment 2 Single carriageway (30mph)	Alignment 2 Single carriageway (50mph)
		issues. Neutral impact on population and economic growth.	to fuel economic growth.	being opened up for development. Scheme likely to provide some congestion alleviation benefits Potential for access to development DLP sites, and will provide additional road capacity to fuel economic growth	road capacity to fuel economic growth.	road capacity to fuel economic growth.	being opened up for development. Scheme likely to provide some congestion alleviation benefits Potential for access to development DLP sites and will provide additional road capacity to fuel economic growth.
	Score	0.50	0.38	0.38	0.38	0.38	0.38
Deliverability	Narrative	Cost £10-20m Good level of support Although some multiple issues could arise in delivery	Cost £20-30m including allowance for land cost Good level of support from public and stakeholders Construction likely to require full closure of Meer End Road junction	Cost £20-30m including allowance for land cost Good level of support from public and stakeholders Construction likely to require full closure of Meer End Road junction	Cost £10-20m including allowance for land cost Good level of support from public and stakeholders Construction likely to require full closure of Meer End Road junction	Cost £20-30m including allowance for land cost Mixed from stakeholders Higher planning risk Requires land take at Waste Lane. Impact on properties Construction likely to require full closure of Meer End Road junction	Cost £20-30m including allowance for land cost Mixed from stakeholders Higher planning risk Requires land take at Waste Lane. Impact on properties Construction likely to require full closure of Meer End Road junction
	Score	1.11	1.03	0.94	1.11	0.47	0.47

Source: Mott MacDonald

9.5.1 PRISM Modelling Results

The preferred route alignment of 50mph single carriage way option was modelled within PRISM, alongside a 30mph single carriageway route alignment. These two alignments were modelled to understand the additional traffic that would be using the link road in both speed scenarios. Plots which display the difference in traffic flow in each scenario are in Appendix C.

9.5.1.1 PRISM Modelling Assumptions

In order to reflect 'real life' speeds and movements within Balsall Common, updates were made to the PRISM network within Balsall Common.

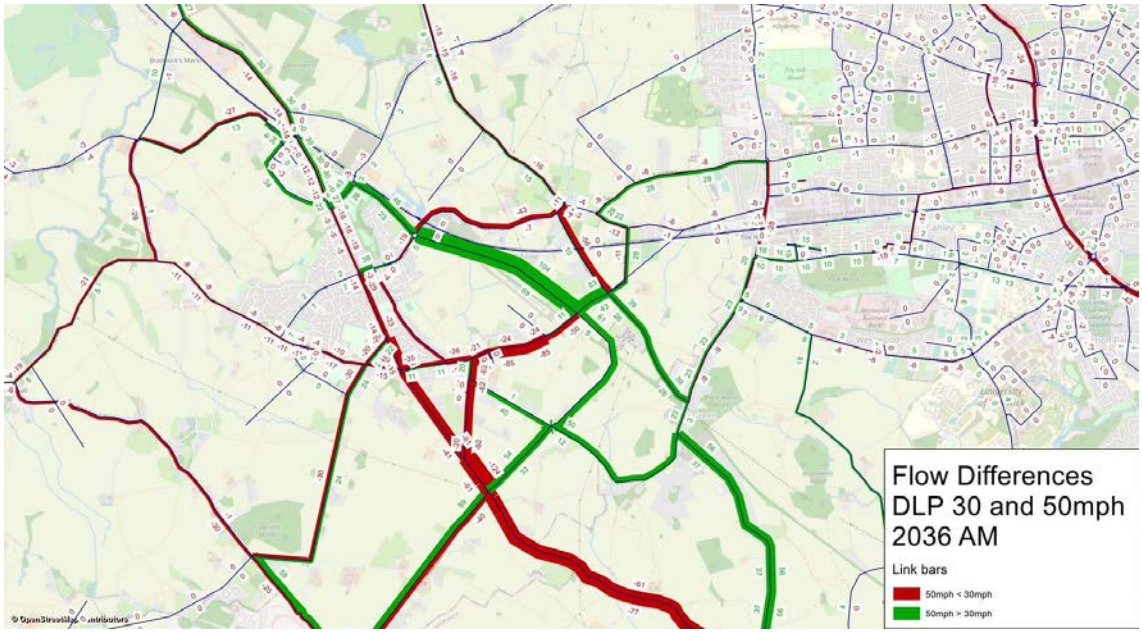
- Lavender Hall Lane has been closed to traffic to encourage route choice through Hallmeadow Road (this was done because multiple route choice in a large strategic model such as PRISM can cause convergence issues and assignment noise in the model)
- Bradnocks Marsh Lane and Barston Lane had speed reduced to 48km/hr
- Hob Lane, Red Lane, Hodgetts Lane (to Waste Lane) and Cromwell Lane (to Hodgetts Lane) have speed reduced to 29km/hr, with capacity reduced to 800 vehicles.
- Indicative signal timings have been used at the Meer End Junction, tying into the new link road link.
- Older PRISM networks were used due to the re-runs with additional development quanta would not be produced for this work.

9.5.1.2 PRISM Modelling Results

Figure 9.4, Figure 9.5 and Figure 9.6 below show an example of the different scenarios run within PRISM and the different route choices shown.

Figure 9.4 shows that through increasing the link road speed to 50mph, more traffic uses it, and there is a reduction in traffic both through and to the west o Balsall Common, meaning that the link road is a more attractive option.

Figure 9.4: DLP 30mph and 50mph Link road 2036 AM



Source: Mott MacDonald

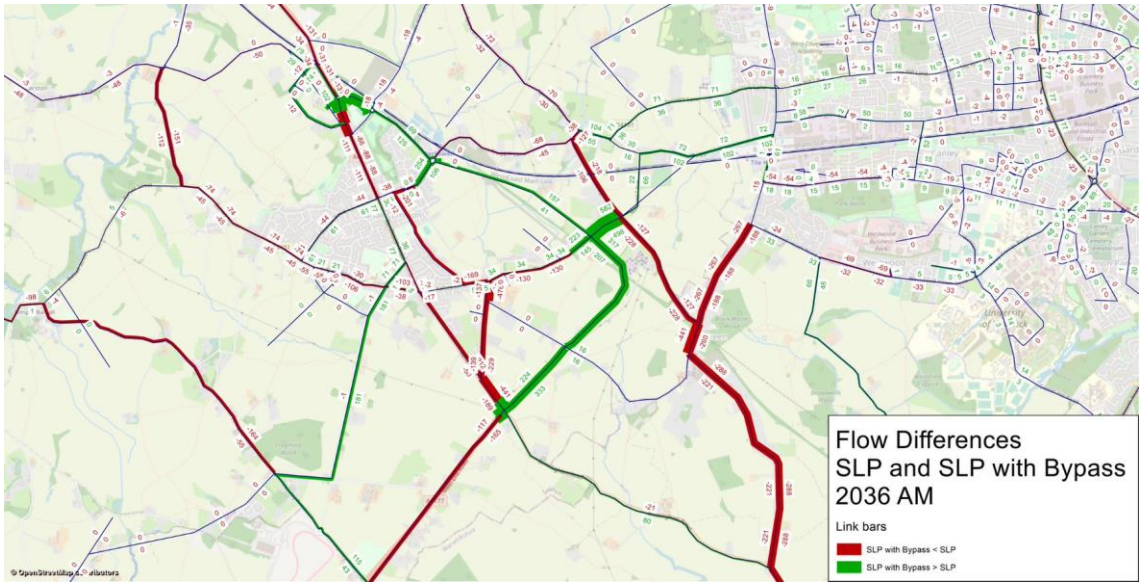
Figure 9.5 displays the difference in traffic flows between the SLP and DLP proposed developments. From the increased in developments at Barretts Farm, the link road has additional vehicles to the access point on Waste Lane.

Figure 9.5: SLP and DLP Link Road 2036 AM

Source: Mott MacDonald

Figure 9.6 displays the difference in traffic flow between the current network in Balsall Common and the network with the addition of a link road. There is a reduction in traffic on the A452, and wider routes around Balsall Common, with traffic opting to use the link road.

Figure 9.6: SLP and SLP without Link Road



Source: Mott MacDonald

9.6 INSET Stage 3 Conclusion

Table 9.4: INSET Stage 3 – Final

Option	Scheme	Pass/Fail	Summary
1	Non-highway-based option	Fail	Does not deliver scheme objectives in isolation Can be implemented alongside link road scheme, with additional benefits to the A452 and connectivity of DLP sites
2	Alignment 1 Single carriageway (30mph)	Fail	Lower speeds not delivering full transport benefits Enable additional road capacity to be released which allows mitigation for future growth The redistribution of traffic away from local roads will provide social and environmental benefits such as reducing severance and accidents, whilst also improving air quality
3	Alignment 1 Single carriageway (50mph)	Pass	Expected to re-assign traffic from local roads and therefore reduce congestion More direct route with reduced delay Enable additional road capacity to be released which allows mitigation for future growth The redistribution of traffic away from local roads will provide social and environmental benefits such as reducing severance and accidents, whilst also improving air quality Severance impact slightly worse than 30mph option Potential to induce additional traffic and thus impact on climate change commitments
4	Alignment 2 Single carriageway (30mph)	Fail	Requires demolition of property on Waste Lane Potential Land take of residential property on Waste Lane Expected to re-assign traffic from local roads and therefore reduce congestion Enable additional road capacity to be released which allows mitigation for future growth The redistribution of traffic away from local roads will provide social and environmental benefits such as reducing severance and accidents, whilst also improving air quality
5	Alignment 2 Single carriageway (50mph)	Fail	Requires demolition of property on Waste Lane Potential Land take of residential property on Waste Lane Expected to re-assign traffic from local roads and therefore reduce congestion Enable additional road capacity to be released which allows mitigation for future growth The redistribution of traffic away from local roads will provide social and environmental benefits such as reducing severance and accidents, whilst also improving air quality
6	MfS 1 - Single carriageway (30mph)	Fail	Provided lowest transport benefits in context of link road objectives Less likely to re-assign traffic from local roads but will still provide some level of additional capacity Potentially easier to deliver and avoid land take Flexible design principles Less severance impacts and improved quality of environment Introduction of traffic calming/ self enforcing if residential area

10 Summary and Conclusion

This Options Assessment Report has been produced to support the case for a potential A452 link road in Balsall Common.

An intervention is proposed by SMBC and is seen as a priority investment to improve the operation of the network, its impacts on local residents, and to provide capacity and resilience which will facilitate and mitigate for planned growth of the Draft Local Plan.

The issues discussed regarding the current operation of the network are likely to be exacerbated in the future, especially with additional traffic flows expected from DLP sites. This planned growth means that there is expected to be an increase in trips on the network which also worsens the capacity constraints along the A452.

10.1 Summary of the stages of assessment

Mott MacDonald's in house Multi Criteria Assessment Framework tool INSET (Investment Sifting and Evaluation Toolkit (INSET) was used to conduct a three staged appraisal process:

- Stage 1 - Appraising a range of strategic level solutions (rather than specific interventions) including all transport modes, managing demand as well as an option to do nothing. The result of Stage 1 was the identification of online and offline highway approaches to be the focus for the remainder of the appraisal process. A non-highways based solution was also taken forward.
- Stage 2 - Undertaking a long-listing exercise identifying many feasible online and offline highways options which fall under the preferred strategic approach, and then assessing those options against a range of social, economic and environmental criteria to lead to a shortlist. The outcome of Stage 2 was the progression of the following options for further appraisal:
  - Non-highways-based option
  - Alignment 1 Single carriageway (30mph)
  - Alignment 1 Single carriageway (50mph)
  - Alignment 2 Single carriageway (30mph)
  - Alignment 2 Single carriageway (50mph)
  - MfS 1 - Single carriageway (30mph)
- Stage 3 - Appraising the shortlisted options to understand in greater depth the likely impacts and deliverability of the scheme options. The result of the appraisal was the identification of a preferred option to identify an area of influence from which a link road scheme could be delivered. The preferred option is Alignment 1 Single carriageway (50mph).

10.2 Confirmation of the preferred option

The preferred option to be taken forward at this stage is Alignment 1 Single carriageway (50mph). This option has been shown to score the highest in all themes and against most criteria throughout the assessment. This option scored particularly highly against the potential to deliver improved connectivity on the local network and at a strategic level, and thereby reduce congestion, severance and accidents. The option will potentially have environmental and deliverability issues which will need to be mitigated during the design development stages,

however this alignment would require the least land take and impact on properties. Whilst several low-cost options were considered in the appraisal process, specifically in INSET Stage 1 and 2, no options showed sufficient benefit to shortlisted.

The scoring suggests the implementation of a low-cost option would not deliver the level of transport benefit associated with higher cost options. The ability to improve strategic connectivity and severance whilst alleviating congestion would be significantly less if a low-cost option was progressed. However, the non-highways based option could be delivered as part of the overall scheme and would complement the introduction of a new link road.

10.3 Next Steps

A Strategic Outline Business Case (SOBC) is recommended to be developed in due course that demonstrates the case for investment at a strategic level and provides the basis for more detailed development work on the scheme. Further detailed design work is recommended to take place at the Meer End Road junction.

Stakeholder engagement is recommended to take place as the scheme develops.

Further design work is recommended to take place on the active travel and non-highways proposals, which establishes a package of measures in addition to a proposed link road. Walking, cycling and public transport links could integrate these proposals with employment, education, leisure and healthcare opportunities with the wider area to ensure that the benefits are widespread.

A. Assessment criteria by INSET stage

Theme	Round 1 - Strategic solutions		Round 2 - Long List		Round 3 - Short list	
	Main Criteria	*Sub Criteria*	*Main Criteria*	*Sub Criteria*	*Main Criteria*	*Sub Criteria*
Transport Benefits	Local connectivity	Improve local connectivity	Local connectivity	Improve local connectivity	Local connectivity	Increased to displace traffic onto from centre onto Link road
						Access to developments
						Reduce journey times on other routes in Balsall Common
	Strategic connectivity	Improve strategic connectivity	Strategic connectivity	Improve strategic connectivity	Strategic connectivity	Minimise delay to strategic traffic between A452 and M42 (through trips)
						Reduction in delay at A452 junctions
	Congestion relief	Ability to relieve congestion	Congestion relief	Ability to relieve congestion	Congestion relief	Reduced local road network delay
Wider Economic Benefits	Potential to deliver and mitigate for growth	Potential to deliver and mitigate for growth	Enable Development	Improved access to land	Enable Development	Improved access to land
			Mitigate for growth	Increased transport capacity	Mitigate for growth	Increased transport capacity
Environment	Environmental impact	Impact on the environment	Environmental impact	Air Quality	Environmental impact	Air Quality
				Landscape		Landscape
				Heritage		Heritage
				Ecology		Ecology
				Noise		Noise
				Biodiversity		Biodiversity
				Climate change and emissions		Climate change and emissions
				Water		Water
Social Impacts (Quality of life)	Social impact	Social impacts	Social impact	Social impacts	Safety and Security	Reduce personal injury accidents on the network
					Severance	Reduced volume of traffic on local road network
					Environmental Quality	Impact on quality of environment for locals
					Health and well-being	Amenity and Occupancy
Alignment with Objectives	Alignment with objectives	Fit with wider policy objectives	Alignment with objectives	Fit with wider policy objectives	Alignment with objectives	Fit with wider policy objectives
		Population & economic growth		Population & economic growth		Population & economic growth
		Sustainable growth		Sustainable growth		Sustainable growth
		Physical and mental wellbeing.		Physical and mental wellbeing.		Physical and mental wellbeing.
Deliverability	Affordability	Scheme cost	Affordability	Scheme cost	Affordability	Scheme cost
	Complexity	Level of complexity	Complexity	Level of complexity	Complexity	Engineering complexity
						Funding risk
					Planning	Public acceptability
						Stakeholder acceptability
						Timescales
	Qualitative		Qualitative		Qualitative/quantitative	

B. Scheme options

Option 1 Plan

NTS

Notes

1. All dimensions are in millimeters unless otherwise stated
2. Do not scale any items or information from this drawing

Key to symbols

Option 1

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	18.08.20	RF	Preliminary Issue		

MOTT MACDONALD

35 Newhall Street
Birmingham
B3 3PU
United Kingdom

Client

Solihull Metropolitan Borough Council

Council House
Manor Square
Solihull
B91 3QB

Project Title

Balsall Common

Drawing Title

Balsall Common Transport Study
Option 1

Designed	R Franklin		Eng check	C Searson	
Drawn	R Franklin		Coordination	L Barley	
Dwg check	C Searson		Approved	T Sheach	

Scale at A1	Suitability	Rev	Security
As Shown	S1	P02	STD

Drawing Number

383525-MMD-SS-ZZ-DR-0001

Option 2 Plan

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Key to symbols

Option 2

Reference drawings

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Drawing Title

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Option 2

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Option 3 Plan
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Option 3

Reference drawings

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Drawing Title

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Option 3

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Scale at A1	Suitability	Rev	Security
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Option 4 Plan

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Option 4

Reference drawings

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Option 4

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Scale at A1	Suitability	Rev	Security
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Option 5 Plan
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Notes

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Option 5

Reference drawings

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B91 3QB

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Drawing Title

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Option 5

Designed	R Franklin		Eng check	C Searson	
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Scale at A1	Suitability	Rev	Security
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Drawing Number
383525-MMD-SS-ZZ-DR-0005

Option 6 Plan
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Notes

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Key to symbols

Option 6

Reference drawings

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Solihull
B91 3QB

Project Title

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Drawing Title

Balsall Common Transport Study
Option 6

Designed	R Franklin		Eng check	C Searson	
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Scale at A1	Suitability	Rev	Security
As Shown	S1	P02	STD

Drawing Number
383525-MMD-SS-ZZ-DR-0006

Option 7 Plan

NTS

Notes

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Key to symbols

Option 7

Reference drawings

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Project Title

Balsall Common

Drawing Title

Balsall Common Transport Study
Option 7

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Dwg check	C Searson		Approved	T Sheach	

Scale at A1	Suitability	Rev	Security
As Shown	S1	P02	STD

Drawing Number

383525-MMD-SS-ZZ-DR-0007

Option 8 Plan
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Notes

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Key to symbols

Option 8

Reference drawings

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Council House
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Solihull
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Project Title

Balsall Common

Drawing Title

Balsall Common Transport Study
Option 8

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Dwg check	C Searson		Approved	T Sheach	

Scale at A1	Suitability	Rev	Security
As Shown	S1	P02	STD

Drawing Number
383525-MMD-SS-ZZ-DR-0008

Overall Site Plan

NTS

Notes

1. All dimensions are in millimeters unless otherwise stated
2. Do not scale any items or information from this drawing

Key to symbols

- Option 1
- Option 2
- Option 3
- Option 4
- Option 5
- Option 6
- Option 7
- Option 8
- Route for all options

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	18.08.20	RF	Preliminary Issue		

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B91 3QB

Project Title

Balsall Common

Drawing Title

Balsall Common Transport Study
Stage 3

Designed	R Franklin		Eng check	C Searson	
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Dwg check	C Searson		Approved	T Sheach	

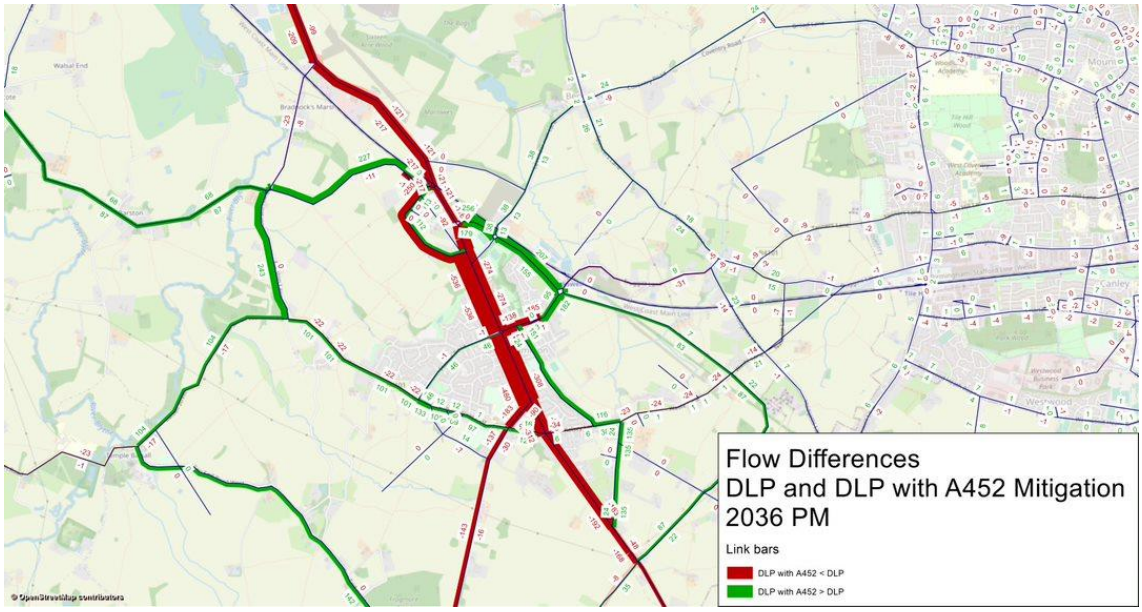
Scale at A1	Suitability	Rev	Security
As Shown	S1	P02	STD

Drawing Number

383525-MMD-SS-ZZ-DR-0001

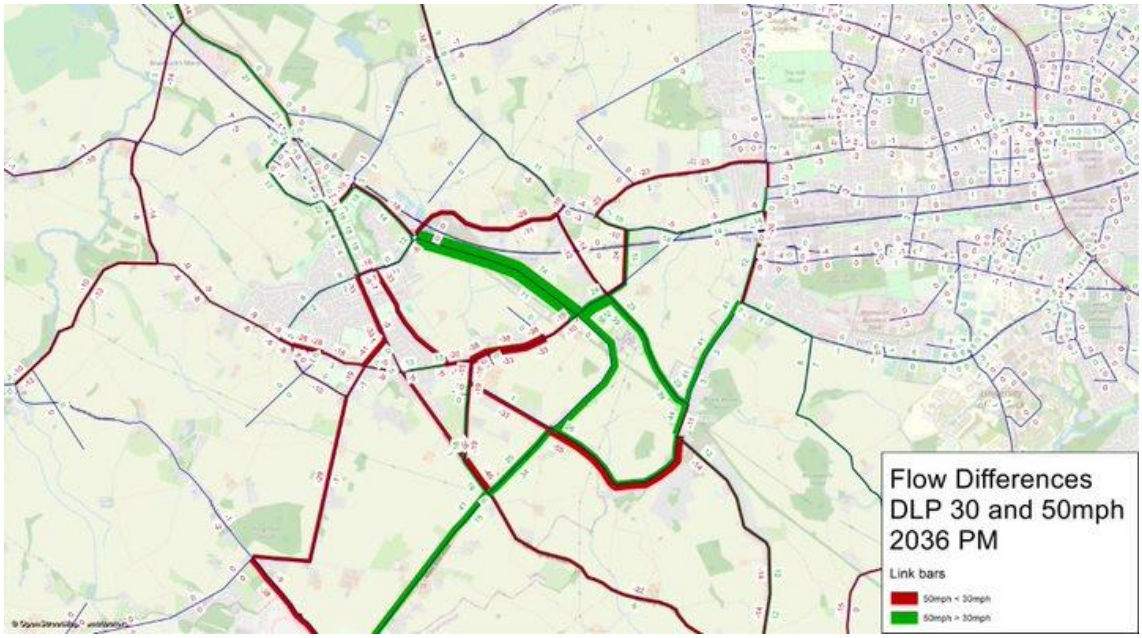
C. PRISM Plots

Figure C.1: A452 Downgrade 2036 PM



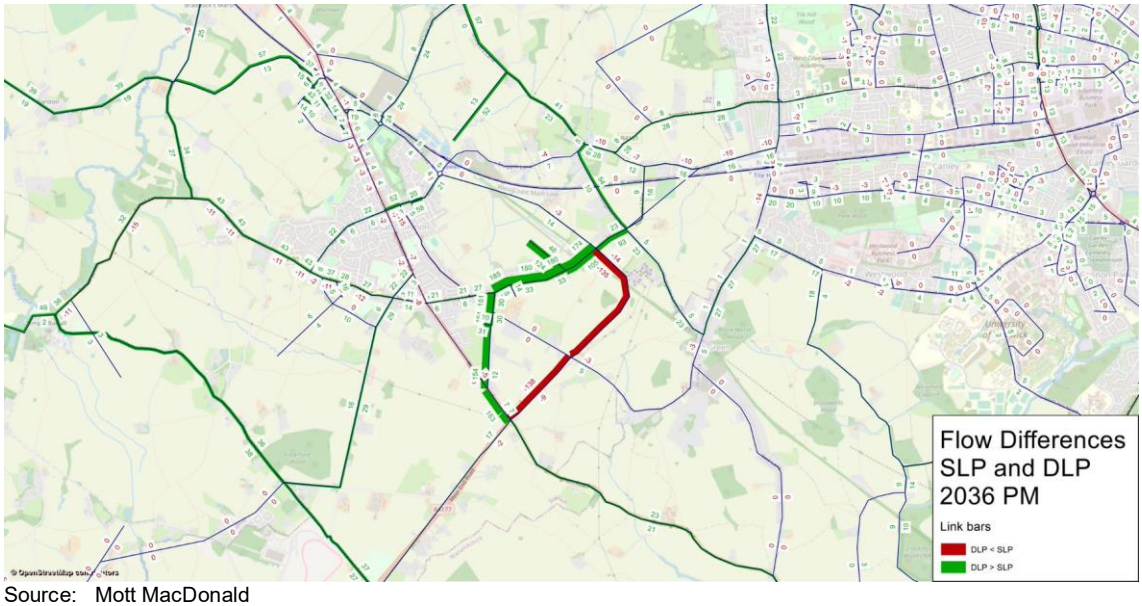
Source: Mott MacDonald

Figure C.2: DLP 30mph and 50mph Link road Options 2036 PM



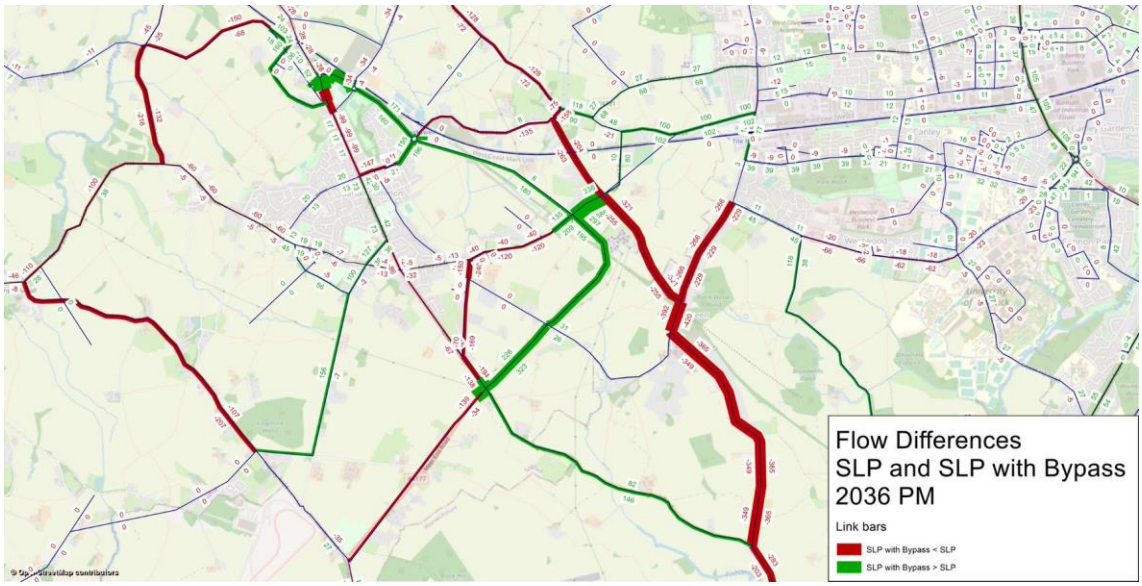
Source: Mott MacDonald

Figure C.3: SLP and DLP 50mph Link road 2036 PM



Source: Mott MacDonald

Figure C.4: SLP and SLP without link road 2036 PM



Source: Mott MacDonald

D. Scheme costs

WBS	Balsall Common Budget Estimates	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8
1	**DIRECT CONSTRUCTION COSTS**	**£ 5,745,186**	**£ 6,313,506**	**£ 11,277,183**	**£ 5,181,509**	**£ 4,864,809**	**£ 8,966,330**	**£ 3,530,165**	**£ 5,540,726**
1.02	SERIES 200: SITE CLEARANCE	£ 284,115	£ 280,093	£ 345,609	£ 327,572	£ 268,760	£ 327,885	£ 52,604	£ 102,164
1.03	SERIES 300: FENCING	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.04	SERIES 400: ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN)	£ -	£ -	£ 1,348,078	£ -	£ -	£ 105,581	£ -	£ -
1.05	SERIES 500: DRAINAGE AND SERVICE DUCTS	£ 904,550	£ 866,968	£ 1,784,816	£ 850,881	£ 836,620	£ 1,676,131	£ 422,680	£ 885,396
1.06	SERIES 600: EARTHWORKS	£ 1,410,744	£ 2,148,506	£ 2,071,623	£ 1,039,719	£ 843,636	£ 1,470,930	£ 1,523,768	£ 1,472,900
1.07	SERIES 700: PAVEMENTS	£ 1,509,493	£ 1,446,739	£ 2,979,392	£ 1,419,876	£ 1,396,062	£ 2,797,906	£ 704,850	£ 1,478,414
1.11	SERIES 1100: KERBS, FOOTWAYS AND PAVED AREAS	£ 442,103	£ 423,724	£ 515,395	£ 415,870	£ 408,886	£ 484,000	£ 206,438	£ 432,736
1.12	SERIES 1200: TRAFFIC SIGNS AND ROAD MARKINGS	£ 61,246	£ 59,820	£ 81,236	£ 58,637	£ 58,476	£ 79,003	£ 48,778	£ 60,029
1.13	SERIES 1300: ROAD LIGHTING COLUMNS AND BRACKETS, CCTV MASTS AND CANTILEVER MASTS	£ 522,481	£ 500,760	£ 1,031,257	£ 491,462	£ 483,219	£ 968,439	£ 243,970	£ 511,411
1.14	SERIES 1400: ELECTRICAL WORK FOR ROAD LIGHTING AND TRAFFIC SIGNS	£ 586,036	£ 562,821	£ 1,091,264	£ 553,559	£ 545,349	£ 1,028,689	£ 307,026	£ 573,431
1.15	SERIES 1500: MOTORWAY COMMUNICATION	£ 16,226	£ 16,226	£ 16,226	£ 16,226	£ 16,226	£ 16,226	£ 16,226	£ 16,226
1.16	SERIES 1600: PILING AND EMBEDDED RETAINING WALLS	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.17	SERIES 1700: STRUCTURAL CONCRETE	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.18	SERIES 1800: STEELWORK FOR STRUCTURES	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.19	SERIES 1900: PROTECTION OF STEELWORK AGAINST CORROSION	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.20	SERIES 2000: WATERPROOFING FOR STRUCTURES	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.21	SERIES 2100: BRIDGE BEARINGS	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.23	SERIES 2300: BRIDGE EXPANSION JOINTS AND SEALING OF GAPS	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.24	SERIES 2400: BRICKWORK, BLOCKWORK AND STONEWORK	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.25	SERIES 2500: SPECIAL STRUCTURES	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.27	SERIES 2700: ACCOMMODATION WORKS	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
1.30	SERIES 3000: LANDSCAPING AND ECOLOGY	£ 8,192	£ 7,851	£ 12,288	£ 7,705	£ 7,576	£ 11,539	£ 3,825	£ 8,020
1.50	SERIES 5000: MAINTENANCE PAINTING OF STEELWORK	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
2	**INDIRECT CONSTRUCTION COSTS**	**£ 1,520,297**	**£ 1,662,377**	**£ 2,903,296**	**£ 1,379,377**	**£ 1,300,202**	**£ 2,325,582**	**£ 966,541**	**£ 1,469,182**
2.01a	CONTRACTORS PRELIMINARIES AND TEMPORARY WORKS	£ 1,436,297	£ 1,578,377	£ 2,819,296	£ 1,295,377	£ 1,216,202	£ 2,241,582	£ 882,541	£ 1,385,182
2.01b	UNSPECIFIED TEMPORARY WORKS AND TRAFFIC MANAGEMENT - allowance of £5,000 per week for 12 weeks	£ 84,000	£ 84,000	£ 84,000	£ 84,000	£ 84,000	£ 84,000	£ 84,000	£ 84,000
2.01c	CONTRACTORS OTHER COSTS - OVERTIME WORKING ALLOWANCE (5%)	£ 287,259	£ 315,675	£ 563,859	£ 259,075	£ 243,240	£ 448,316	£ 176,508	£ 277,036
2.01d	CONTRACTORS OVERHEAD AND PROFIT	£ 799,203	£ 877,347	£ 1,559,853	£ 721,698	£ 678,151	£ 1,242,110	£ 494,638	£ 771,090
	BASE COST ESTIMATE (DIRECT COSTS + INDIRECT COSTS)	**£ 7,265,483**	**£ 7,975,883**	**£ 14,180,478**	**£ 6,560,886**	**£ 6,165,012**	**£ 11,291,912**	**£ 4,496,706**	**£ 7,009,908**
3	**DESIGN COSTS**	**£ 1,017,168**	**£ 1,116,624**	**£ 1,985,267**	**£ 918,524**	**£ 863,102**	**£ 1,580,868**	**£ 629,539**	**£ 981,387**
3.01	Stated Project Phase Design Fees	£ 1,017,168	£ 1,116,624	£ 1,985,267	£ 918,524	£ 863,102	£ 1,580,868	£ 629,539	£ 981,387
4	**PROJECT MANAGEMENT COSTS**	**£ 846,429**	**£ 929,190**	**£ 1,652,026**	**£ 764,343**	**£ 718,224**	**£ 1,315,508**	**£ 523,866**	**£ 816,654**
4.01	Client Project Organisation	£ 846,429	£ 929,190	£ 1,652,026	£ 764,343	£ 718,224	£ 1,315,508	£ 523,866	£ 816,654
5	**OTHER PROJECT COSTS**	**£ 181,637**	**£ 199,397**	**£ 354,512**	**£ 164,022**	**£ 154,125**	**£ 282,298**	**£ 112,418**	**£ 175,248**
5.01	Environmental Mitigations (2.5% of Base Cost Estimate)	£ 181,637	£ 199,397	£ 354,512	£ 164,022	£ 154,125	£ 282,298	£ 112,418	£ 175,248
5.02	Land Acquisition								
6	**INFLATION**	**£ 436,673**	**£ 479,369**	**£ 852,280**	**£ 394,325**	**£ 370,532**	**£ 678,670**	**£ 270,263**	**£ 421,312**
6.01	Base date 1Q19 ; 4.69% inflation applied to uplift to 3Q2020 (based on forecast of RPI)	£ 436,672.61	£ 479,369.31	£ 852,280.08	£ 394,324.69	£ 370,531.70	£ 678,670.45	£ 270,262.58	£ 421,311.94
7	**TAXATION**	**£ -**	**£ -**	**£ -**	**£ -**	**£ -**	**£ -**	**£ -**	**£ -**
7.01	Stated Taxes	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	PROJECT COST ESTIMATE	**£ 9,747,389**	**£ 10,700,463**	**£ 19,024,563**	**£ 8,802,101**	**£ 8,270,994**	**£ 15,149,256**	**£ 6,032,791**	**£ 9,404,509**
8	**RISK & CONTINGENCY COSTS**								
8.01	P50 Contingency	£ 3,314,112	£ 3,638,158	£ 6,468,351	£ 2,992,714	£ 2,812,138	£ 5,150,747	£ 2,051,149	£ 3,197,533
8.02	P80 Contingency	£ 3,898,956	£ 4,280,185	£ 7,609,825	£ 3,520,840	£ 3,308,398	£ 6,059,702	£ 2,413,116	£ 3,761,804
8.03	P90 Contingency	£ 6,433,277	£ 7,062,306	£ 12,556,212	£ 5,809,386	£ 5,458,856	£ 9,998,509	£ 3,981,642	£ 6,206,976
8.04	Optimism Bias	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	ANTICIPATED FINAL COST (P50)	**£ 13,061,501**	**£ 14,338,621**	**£ 25,492,915**	**£ 11,794,815**	**£ 11,083,132**	**£ 20,300,003**	**£ 8,083,940**	**£ 12,602,042**
	ANTICIPATED FINAL COST (P80)	**£ 13,646,345**	**£ 14,980,649**	**£ 26,634,388**	**£ 12,322,941**	**£ 11,579,392**	**£ 21,208,958**	**£ 8,445,907**	**£ 13,166,312**
	ANTICIPATED FINAL COST (P90)	**£ 16,180,666**	**£ 17,762,769**	**£ 31,580,775**	**£ 14,611,487**	**£ 13,729,851**	**£ 25,147,765**	**£ 10,014,433**	**£ 15,611,485**

E. Optioneering Report

MOTT MACDONALD

Balsall Common Transport Study

Optioneering

12 July 2018

Solihull MBC

Mott MacDonald
35 Newhall Street
Birmingham B3 3PU
United Kingdom

T +44 (0)121 234 1500
F 44 (0)121 200 3295
mottmac.com

Solihull MBC
Council House
Manor Square
Solihull
B91 3QB

Balsall Common Transport Study

Optioneering

12 July 2018

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Contents

1 Introduction 1
1.1 Study Background 1
1.2 Stages 1, 2, 3 and 4(i) Summary 2
1.3 Report Structure 2

2 Key Issues 4
2.1 Introduction 4
2.2 Summary of Issues 4

3 The Case for Intervention 5
3.1 Introduction 5
3.2 Through Traffic Analysis 5
3.3 Intervention Objectives 8
3.4 Policy Linkages 8
3.4.1 Statutory Development Plan: Solihull Local Plan (2013) 8
3.4.2 Emerging Planning Policy: Draft Solihull Local Plan Review (2016) 9
3.4.3 Other Reports / Guidance Documents 10
3.5 Summary 10

4 Option Generation 11
4.1 Introduction 11
4.2 Corridor Approach 11
4.3 Longlist of Route Options 12
4.4 Route Option Rationale 13
4.5 Summary 14

5 Option Assessment 15
5.1 Introduction 15
5.2 Methodology 15
5.3 Development of Assessment Criteria 15
5.3.1 Strategic Theme 15
5.3.2 Economic Theme 16
5.3.3 Environmental Theme 16
5.4 Option Costing 16
5.5 Option Appraisal 17
5.5.1 Approach 17
5.5.2 Summary of Findings 17

6 Option Recommendation and Next Steps 19
6.1 Option Recommendation 19
6.2 HS2 Environmental Statement 19
6.3 Solihull SHLAA (2012) Representations 20
6.4 Next Steps 22

A. Bypass Route Analysis Technical Note 23
A.1 Introduction 23
A.2 Route Areas 23
A.3 West Route Option 23
A.4 East Route Option 25
A.5 Central Route Option 27
A.6 Conclusion 28

B. Bypass Route High Level Costing 30
B.1 Assumptions & Exclusions 30

C. INSET Scores 33
C.1 Strategic Theme 33
C.2 Economic Theme 33
C.3 Environmental Theme 33

D. Scoring Justification 34
D.1 Strategic Case 35
D.2 Economic Case 36
D.3 Environmental Case 37

1 Introduction

1.1 Study Background

Mott MacDonald has been commissioned by Solihull MBC (SMBC) to provide advice in relation to part of the transport evidence base needed to support the ongoing review of the Local Plan. This advice is being developed through the Balsall Common Transport Feasibility Study.

The current Local Plan, the 'Solihull Local Plan', was adopted in December 2013 and covers the period 2011 to 2028. Since the Local Plan was adopted, a legal challenge has resulted in the overall housing requirement being annulled and remitted back to the Council for reconsideration.

The Government's plan for high speed rail was given Royal Assent in February 2017, giving HS2 Limited the full legal, financial and planning powers to build Phase One of the scheme. The first HS2 station outside of London is to be built in Solihull on land next to the M42 and opposite the National Exhibition Centre (NEC), with works scheduled to start in 2017 and construction complete by 2026. The Interchange station will be constructed on land that is currently within the Green Belt, as part of the new Birmingham International Hub connecting it with the NEC, Birmingham International Station and Birmingham International Airport.

To ensure that a robust planning framework is in place that addresses these issues, the Council is undertaking a Local Plan Review (LPR). To support the LPR, SMBC require a comprehensive transport evidence base, detailing the impacts of the revised plan on the transport network and any potential supporting mitigation measures.

Balsall Common is identified in both the Housing Strategy and the Employment Strategy of the Draft LPR as the focus of a large amount of development growth over the next 10 to 20 years. The impact of this intensification of growth is likely to place considerable strain on the Balsall Common transport network. Although these housing and employment allocations are not listed as being dependent on new infrastructure requirements, transport interventions are likely to be needed to enable sustainable economic growth of Balsall Common and the district.

The A46 Link Road Scheme is a major development for the sub-region, proposed by Coventry City Council and Warwickshire County Council. The scheme is formed of three phases, with the ambition of implementation across the next 10 years, to ease congestion, improve access to centres of education and commerce and facilitate growth. While Phase 2 would provide a road linking the A46 at Stoneleigh Junction with Westwood Heath, Phase 3 would see a further link towards either the A45 or A452. However, as plans are only in principal at the time of writing, the potential effects of this scheme are not considered in detail as part of this study.

The Balsall Common Transport Feasibility Study has been divided into different stages, summarised as follows:

- Stage 1 – Inception (Scoping Report submitted to SMBC, 6 April 2017)
- Stage 2 / 3 – Baselining / Constraints Mapping (report submitted to SMBC, May 2017)
- Stage 4 – Optioneering and Costings
- Stage 5 – Appraisal
- Stage 6 – Recommendations

'Stage 4 – Optioneering and Costings' has been split into two separate reports:

i.) Looking to provide the initial picture of future network impact as a result of the expected growth and how this affects the Optioneering stage of the Study.

ii.) Providing options for, and high-level costing of identified options where necessary

This report covers Stage 4(ii) as well as Stages 5 and 6, with options identified, costed and appraised and a recommendation made to conclude this package of work.

1.2 Stages 1, 2, 3 and 4(i) Summary

'Stage 1 – Inception' took the form of a Scoping Report that set out the scope of this study and provided background information as to why it has been commissioned. It also formulated the modelling approach used to understand demand and assignment on the local highway network and summarised the extent of current traffic data available within the study area. Finally, data requests were made to SMBC to aid the study and a future programme of work developed.

'Stages 2 and 3 – Baselining / Constraints Mapping' took the form of a report that set out the planning policy context pertaining to Balsall Common, giving background information of the strategic fit of this study with planning policy at a local, regional and national scale. This study then went on to assess the basic land use and travel demand, as well as the highway, public transport and active modes networks within the study area. Finally, an assessment was made of a range of planning, environmental and geological constraints in the area, with maps provided for each constraint type.

The first part of 'Stage 4 – Optioneering and Costings' took the form of a report that analysed Balsall Common's highway network in detail, assessing the need for highway intervention within the study area in the context of future development. Historic traffic growth was analysed alongside existing traffic conditions and planning data through the use of industry-standard software in TEMPro and TRICS to understand the level of future growth from a range of sources, including UK Central, HS2, planned development growth and Balsall Common itself. Finally, the report summarised the key challenges facing the highway network in Balsall Common and how these impact on the need for intervention, making recommendations as to the next element of the Study. These were as follows:

- Produce a list of options for improving Balsall Common's highway network
- Provide high-level costing of each option
- Produce a shortlist of these options and make a final recommendation as to which option / package of measures should be taken forward.

1.3 Report Structure

The purpose of this report is to provide options for highway intervention in Balsall Common, based on the issues outlined in the previous report. These will be described, analysed and sifted to inform a recommended option for Balsall Common's highway network.

The report is structured as follows:

- Chapter 2 presents the key issues within the study area, highlighted in the previous 'Impact of Future Growth on the Network' report.
- Chapter 3 restates the case for highway intervention in Balsall Common with the use of through traffic analysis. This analysis exemplifies the traffic relief that Balsall Common could benefit from, as well as assessing the objectives that any intervention should wish to achieve and the policy linkages that establish why this is necessary.

- Chapter 4 sets out the long list of Options, based on identifying broad corridors and route options identified within these corridors. Rationale is also given as to why these options have been chosen.
- Chapter 5 describes how these options were sifted using Mott MacDonald's Investment Sifting and Evaluation Tool (INSET), setting out the full appraisal process and summarising its findings.
- Chapter 6 provides a recommended option and sets out next steps for SMBC in order to develop this option further towards scheme delivery.

2 Key Issues

2.1 Introduction

This section summarises the key issues facing the highway network in Balsall Common as a result of future growth within and around the Study Area, determined through the previous 'Impact of Future Growth on the Network' report.

2.2 Summary of Issues

The 'Impact of Future Growth on the Network' concludes that Balsall Common is likely to be affected by several major planned developments within the Local Plan period. These vary in size, scale and duration and are themselves multi-faceted, with the new HS2 alignment cutting close to the settlement.

These developments have the potential to compound the highway issues that have already been identified within the study area through generating more traffic on the network as a result of general traffic growth, planned developments and development at the UK Central Hub. These issues are summarised in Table 1 below.

Table 1: Summary of Current and Future Issues within the Study Area

Challenge Location	Current	Future	Issue	Summary of Underlying Issue
A452 Kenilworth Road / B4101 Kelsey Lane / Alder Lane	✓	✓	Capacity / Congestion	This junction is a root cause of congestion and delay throughout the Study Area, being over or approaching capacity at peak times and predicted to worsen with further developments such as HS2 and UK Central.
A452 busy between the Hallmeadow Road roundabout and A4177 Meer End junction	✓	✓	Capacity / Congestion	The A452 is the main route between Solihull and Leamington Spa, Kenilworth and Warwick, running directly through the centre of Balsall Common. At peak times, it is heavily congested with very slow-moving traffic for an approximate 2-mile stretch between the Hallmeadow Road roundabout that links to Berkswell rail station and the A4177 Meer End Road junction, linking to Warwick.
High levels of car ownership in Balsall Common and low take-up of alternative modes	✓	✓	Capacity / Congestion	As a rural location with a general lack of public transport links other than Berkswell rail station, Balsall Common has a very high level of car ownership at 1.8 vehicles per household, significantly higher than the national average of 1.2. This is partly caused by the relative wealth and older average age of the area, and exacerbates the capacity issues experienced on the A452.
Accident cluster at the Waste Lane / Hodgett's Lane junction	✓	✓	Road Safety	Between 2012 and 2016, four slight and two serious accidents occurred at the junction between Waste Lane and Hodgett's Lane. It has been identified that this junction has particularly poor visibility, with speed an issue as a result.

Source: Mott MacDonald

3 The Case for Intervention

3.1 Introduction

This section restates the case for intervention in Balsall Common's highway network, based upon the challenges outlined in Chapter 2. Further evidence is provided by an analysis of through traffic in the Study Area and objectives for the intervention are set out, alongside linkages to local and regional planning and transport policy.

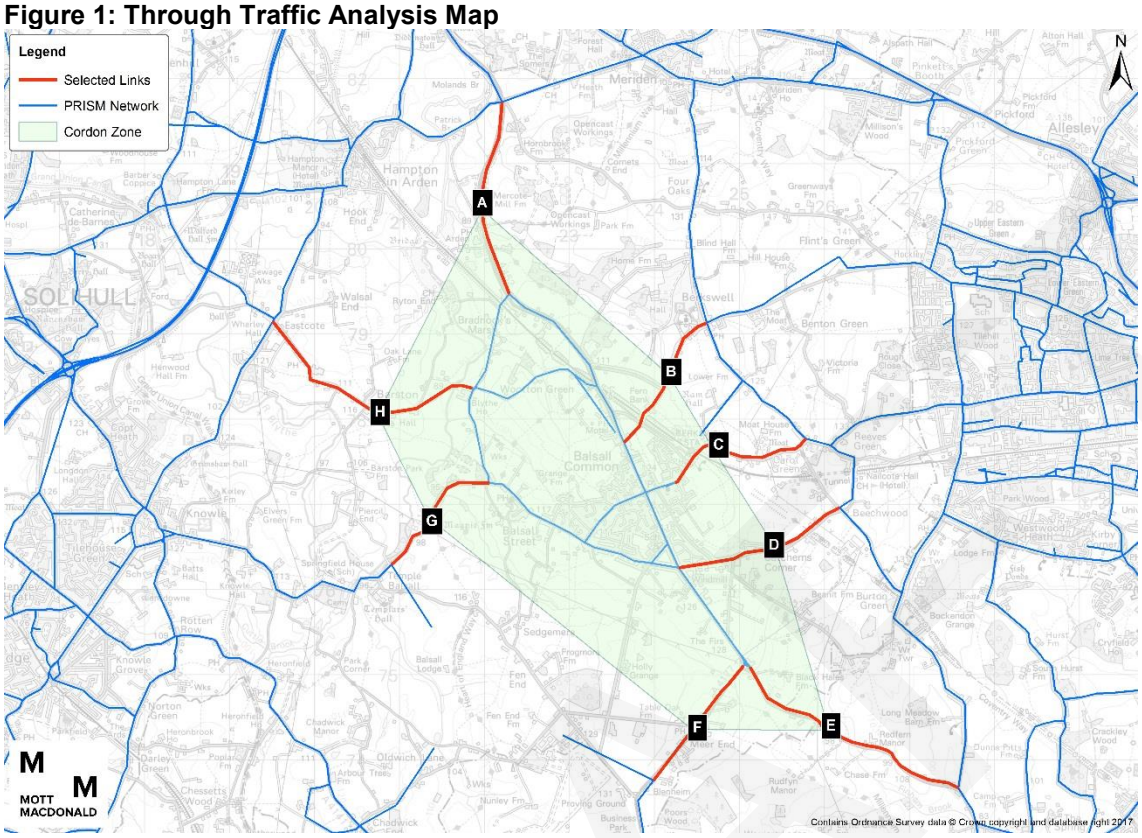
3.2 Through Traffic Analysis

Figure 1 below provides a map of the study area for our through traffic analysis, with a cordon zone drawn out to include the A452 north of the Hallmeadow Road roundabout and south of the A4177 Meer End Road junction, as well as other key link roads within the study area such as the B4101 Alder Lane / Kelsey Lane, Station Road and the A4177 Meer End Road.

Eight links were chosen for assessment, using PRISM[1] data; the percentage of traffic across the cordon that did not stop in Balsall Common and exited the cordon in one trip. This was designed as such to inform us of where traffic enters and leaves the study area, as well as the proportion that passes through, starts, or ends in Balsall Common. Given that a by-pass route would only be used by through traffic, the proportion of this type of traffic would have to be significant to establish the need for such an intervention.

[1] PRISM (Policy Responsive Integrated Strategy Model) is a strategic transport model of the West Midlands funded, owned and managed by the seven Metropolitan Authorities, Highways England and Transport for West Midlands. The model was developed, and is maintained by Mott MacDonald and RAND Europe on the owner's behalf.

Figure 1: Through Traffic Analysis Map



Source: PRISM 2015

Table 2 below presents the percentages of through traffic in Balsall Common in both the AM and PM peaks for entry to the cordon from each link, taken from 2015 PRISM Data.

Table 2: Proportion of Through Traffic in Balsall Common

Link	% Through Traffic	
	AM	PM
A: A452 Kenilworth Road (north)	73%	56%
B: Lavender Hall Lane	100%	100%
C: Station Road / Truggist Lane	13%	19%
D: B4101 Kelsey Lane / Waste Lane	100%	100%
E: A452 Kenilworth Road (south)	97%	91%
F: A4177 Meer End Road	96%	83%
G: B4101 Balsall Street	87%	78%
H: Barston Lane / Wootton Lane	71%	50%
Total	**84%**	**71%**

Source: PRISM 2015

As can be observed, links B and D (Lavender Hall Lane and B4101 Kelsey Lane / Waste Lane respectively) have 100% through traffic, denoting that no one who travels into or out of Balsall Common at peak times stops in the village.

Given that the A452 is the key route through the village, links A, E and F are the most important links for this study as they denote the proportion of traffic using the A452 for its full length through the study area, which is creating the observed capacity issues at peak times. The figures for each link are high, with 56% (Link A in the PM peak) the lowest figure for these links, generally supporting the case for intervention as most vehicles do not stop in Balsall Common and would be expected to use a by-pass route if it was available.

Table 3 and Table 4 present the 2015 flows between each point for both the AM and PM peak periods.

From these figures, it is possible to calculate the number of vehicles which would be expected to use a bypass route around Balsall Common, using the assumption that all through traffic would use it.

Table 3: AM Peak Through Traffic

		To								
From	Total	A	B	C	D	E	F	G	H	%TT
A	705	-	0	0	0	243	217	52	0	73%
B	49	0	-	0	0	0	15	16	18	100%
C	48	0	0	-	0	0	0	6	0	13%
D	23	0	0	0	-	0	11	12	0	100%
E	414	225	0	0	0	-	148	26	3	97%
F	345	209	5	0	20	96	-	0	0	96%
G	246	62	5	23	91	29	0	-	4	87%
H	21	0	0	1	11	3	0	0	-	71%
Total	**1851**									**84%**

Source: PRISM 2015

These figures show a total of 84% of traffic in the AM peak and 71% in the PM peak is through traffic, suggesting the vast majority of traffic in the study area does not stop in Balsall Common during peak times.

In the AM peak, an eastern bypass would attract traffic travelling between points A to F, with this totalling 945 vehicles, or 51.05% of all traffic entering the cordon at these points.

A western bypass would attract traffic travelling between point A and points E to H, with this totalling 1,073 vehicles, or 57.97% of all traffic entering the cordon at these points.

Table 4: PM Peak Through Traffic

		To								
From	Total	A	B	C	D	E	F	G	H	%TT
A	808	-	0	0	0	145	269	37	0	56%
B	26	0	-	0	0	0	4	7	16	100%
C	85	0	0	-	0	0	0	16	0	19%
D	106	0	0	0	-	0	10	86	10	100%
E	423	299	0	0	0	-	21	42	21	91%
F	410	131	36	0	25	147	-	0	0	83%
G	204	98	13	13	24	6	0	-	5	78%
H	42	0	8	2	4	7	0	0	-	50%
Total	**2104**									**71%**

Source: PRISM 2015

In the PM peak, an eastern bypass would attract traffic travelling between points A to F, with this totalling 919 vehicles, or 43.68% of all traffic entering the cordon at these points.

A western bypass would attract traffic travelling between point A and points E to H, with this totalling 1,060 vehicles, or 50.38% of all traffic entering the cordon at these points. To summarise, a western bypass would attract more traffic than an eastern routing purely based on these figures, but this does not include traffic accessing the planned developments at Barretts Farm, Windmill Lane and Frog Lane. The bypass route would also be used by a similar number of vehicles in both the AM and PM peaks, although this would be a higher proportion in the AM peak.

3.3 Intervention Objectives

The need case for highway intervention in Balsall Common has been illustrated in Chapters 2 and 3, with highway issues within the study area outlined, the level of future development in the study area reiterated and the level of through traffic in Balsall Common assessed to prove that a high proportion of vehicles could be expected to use any new highway intervention.

It is now important to state what should be achieved by any potential highway intervention. Table 5 below outlines the numerous strategic and operational objectives for highway intervention in Balsall Common, upon which future plans must be based.

Table 5: Objectives of Highway Intervention

Strategic Objectives	Support Economic Growth	Facilitate growth in housing and employment in Balsall Common and the wider region
Operational Objectives	Capacity	Reduce delay and queues during peak periods
	Resilience	Improve the resilience of the A452, such that the number of incidents and the effect of these incidents are reduced
	Safety	Reduce the number of collisions within the study area
	Environmental	Minimise unacceptable impacts on the surrounding natural environment and landscape and optimise the environmental opportunities and mitigation that the intervention could bring

Source: Mott MacDonald

3.4 Policy Linkages

Even though a need case for highway intervention in Balsall Common has been established, such a key project in both a local and regional context must fit with planning and transport policy at these scales. This section sets out the linkages between such policy and the case for highway intervention in Balsall Common.

3.4.1 Statutory Development Plan: Solihull Local Plan (2013)

The current Statutory Development Plan for the administrative area of SMBC comprises the Solihull Local Plan (SLP) (2013) which was adopted on 3rd December 2013 and covers the period 2011 to 2028. The document replaced the saved policies of the Solihull Unitary Development Plan (SUDP) (2006) and is the starting point for producing planning documents in Solihull and forecasting how the area will develop in the future. Fundamentally, it provides the backbone for housing and commercial growth proposals in the borough.

The SLP does not include an overall housing requirement due to this being deleted and remitted back to the Council for reconsideration following a successful legal challenge following adoption of the Plan.

In Paragraph 5.4.8 of the Local Plan itself, it is stated that there is a distinct need to:

"Exploit the role of transport in promoting and managing growth, whilst ensuring opportunities to access key destinations by a choice of transport modes, and that new development does not exacerbate congestion".

The most recent strategy guiding transport interventions for the Borough is set out in the existing SLP; Chapter 9 'Improving Accessibility and Encouraging Sustainable Travel'.

Paragraph 9.3.15 of the existing SLP refers to a longstanding bypass scheme for Balsall Common, retained from the now-superseded SUDP (2006). The Local Plan states that the principal purpose of the scheme would be to remove traffic from the centre of Balsall Common, nevertheless noting that:

"It is…conceivable that the implementation of such [a] bypass line could be detrimental to the vitality and viability of the centre".

As such, the Council considered that priorities for transport investment had altered significantly since the initial safeguarding of bypass schemes, particularly in relation to local centres. Hence, the need for the scheme to be retained in the Local Plan no longer existed and was omitted.

3.4.2 Emerging Planning Policy: Draft Solihull Local Plan Review (2016)

Consultation on the Draft Local Plan (November 2016) was undertaken between December 2016 and January 2017. The results of the consultation are currently being considered by the Council and will be used, along with other evidence being prepared (including this study), to assist the Council in preparing the next stage of the Plan Making process. This will result in publication of the submission version of the plan which will be submitted to the Secretary of State for examination at some stage this year.

The 2006 Unitary Development Plan sought to safeguard the lines of three longstanding potential by-passes to Balsall Common, Hockley Heath and Knowle. The Solihull Local Plan concluded that there was no justification to retain the safeguarding of the lines previously identified in the Unitary Development Plan. The Local Plan Review reiterates that there is nothing to suggest that this conclusion needs to be revisited, however; this is may not be the case in relation to Balsall Common as stated at Paragraph 267:

> *"The traffic associated with the HS2 Interchange site (and wider Hub area), and growth potential south of Coventry, especially when combined with traffic generated from new housing in the area, is likely to have an effect on the A452 as it passes through Balsall Common. This is expected to justify the provision of an alternative route that could accommodate through traffic, and provide a basis for new residential developments to access the network in an appropriate manner. This alternative route will be pursued through the local plan review, although at this stage a specific line is not being proposed. Further scoping/ feasibility work will be undertaken to assess costs, benefits and potential funding/delivery options and timescales for its provision. This work will be taken forward through the later stages of the local plan review".*

It is within these terms that this Study has been commissioned in order to provide a suitable evidence base.

3.4.3 Other Reports / Guidance Documents

3.4.3.1 Solihull Connected Delivery Plan (2016-2036)

This document is part of the Local Plan Review evidence base, and cites the Balsall Common bypass scheme. The scheme is within 'Priority Area 4', which looks at enabling the HS2 Growth Strategy and Local Plan Review. Rationale for a potential bypass scheme is given as such:

"*The scale of growth in the UK Central Hub area is likely to generate additional traffic movements in the surrounding area and, when combined with additional housing growth within the Borough, there may be a case to reinstate the Balsall Common Bypass Improvement Line. Through the Local Plan process the need for a Bypass will be reviewed, along with the opportunities it may generate to enhance public realm and the place function of the village centre".*

The Solihull Connected Delivery Plan goes on to state that further scoping/ feasibility work will be required subsequently to consider the costs, benefits and potential funding/ delivery options and timescales, should the implementation of a bypass be considered necessary. This will be provided as a result of this Study.

3.4.3.2 West Midlands LTP3 (2011-2026)

This document sets out a vision for the West Midlands, analysing travel problems and opportunities and then setting clear objectives and policies to tackle these issues. It also includes a programme of transport interventions that will help to achieve these.

A bypass route is given for the A452 in Balsall Common, running to the east of the village centre. A bypass scheme is highlighted within the document as part of the vision for transport in Solihull from 2021 to 2026.

3.5 Summary

As a result of detailed through traffic analysis, the need case for highway intervention has been reiterated. Not only is Balsall Common in need of intervention due to the volume of traffic currently on the network and in future years, but this intervention has been proven to be effective in relieving the village centre to the approximate figure of 50%.

Any intervention must also fulfil other policy objectives, such as supporting economic growth and having minimal environmental impact, which links directly to recent planning and transport policy, which has also been assessed in detail.

Any bypass route could potentially be accompanied by a downgrade of the existing A452 to improve public realm, safety and environmental impact within the village, improving the vitality and viability of Balsall Common in direct contrast with how this scheme is perceived in the existing Solihull Local Plan (2013) in Chapter 3.4.1. This could be achieved through:

- Traffic calming / public realm improvements
- Widened pedestrian footways
- Cycleways
- Greater public transport provision

The next section shall not include reference to a downgrade of the existing A452 as it will instead focus on providing potential route options for highway intervention in Balsall Common, which shall be appraised in order to give an outline recommendation. However, this should be considered in conjunction with the recommended option.

4 Option Generation

4.1 Introduction

This section provides a longlist of options for highway intervention in Balsall Common, identified through focusing on the specific challenges in the Study Area. These take the form of corridors and multiple route options within these to establish a robust optioneering process.

4.2 Corridor Approach

The study built upon work undertaken to date on potential proposals wherever possible, drawing upon a range of studies and policies referenced in Chapter 3.4.

As the vast majority of congestion and capacity issues within the study area pertain to the A452 Kenilworth Road, the foci of the highway intervention options exclusively relate to this route.

The first stage of option identification was to identify potential broad route corridors that could:

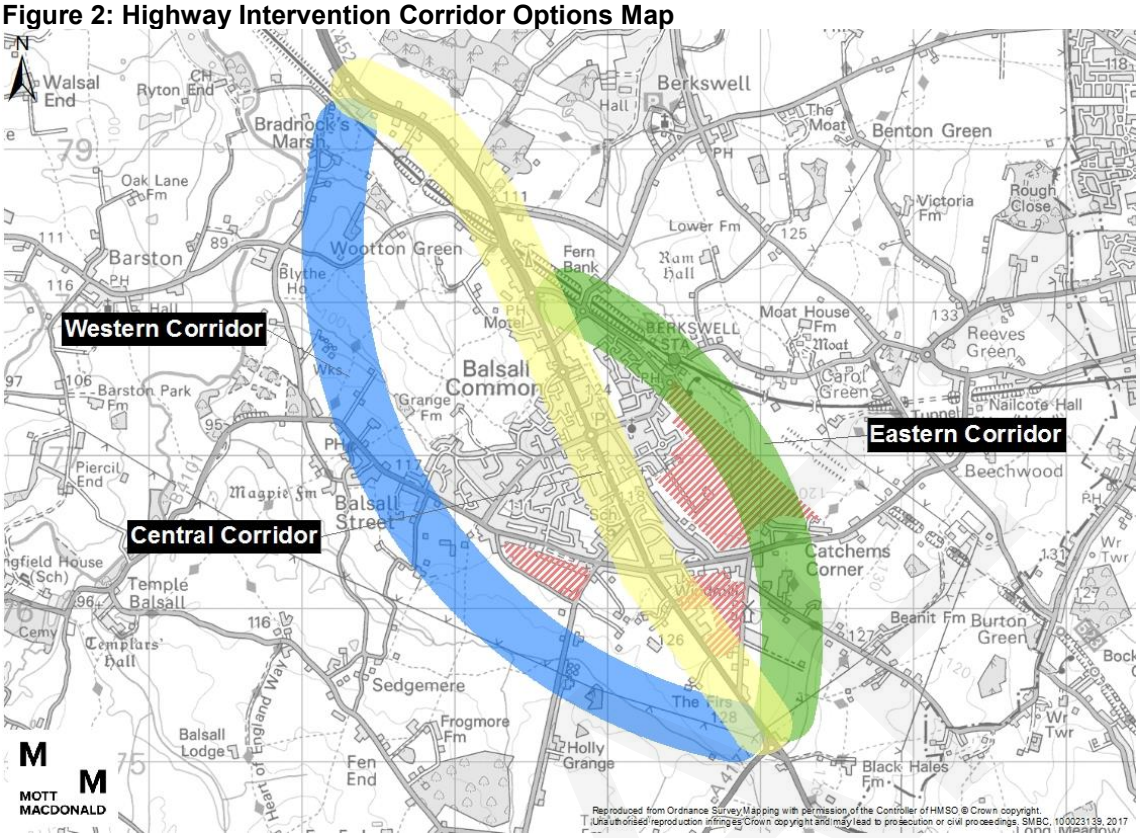
- Have minimal impact upon existing environmental, physical and planning constraints
- Increase capacity along the A452, including junctions
- Alleviate peak-time congestion
- Separate through-traffic trips from those that have Balsall Common as their destination
- Reduce road user conflicts and accidents

Ultimately, the corridors would look to solve the issues highlighted in Chapter 2 and achieve the broad objectives summarised in Table 3, producing a highway network in Balsall Common that is futureproof and ready for the numerous developments planned within and around the study area. The study area can be considered as offering three corridors of route options. These are:

- A western corridor between the A452 Kenilworth Road north of the Hallmeadow Road roundabout and the A452 / A4177 junction via Balsall Street
- A central corridor in which the existing A452 is upgraded between the Hallmeadow Road roundabout and the A452 / A4177 junction
- An eastern corridor between the Hallmeadow Road roundabout and the A452 / A4177 junction

These corridors are shown in Figure 2 below.

Figure 2: Highway Intervention Corridor Options Map



Source: Mott MacDonald

A technical note was produced to analyse these three broad route corridors in detail, concisely considering the engineering and environmental constraints present in the vicinity of each corridor. The conclusion from this document was:

- The western route should be investigated further to ascertain if route options can be developed to account for the West Coast Main Line railway, listed buildings, flood zones, powerlines and topography
- The eastern route can be developed into options utilising Hallmeadow Road and considering surrounding developments and HS2 infrastructure
- The A452 'upgrade' option seems unfeasible but should be considered through robust optioneering to form a thorough comparative exercise

The full technical note is located in Appendix A.

4.3 Longlist of Route Options

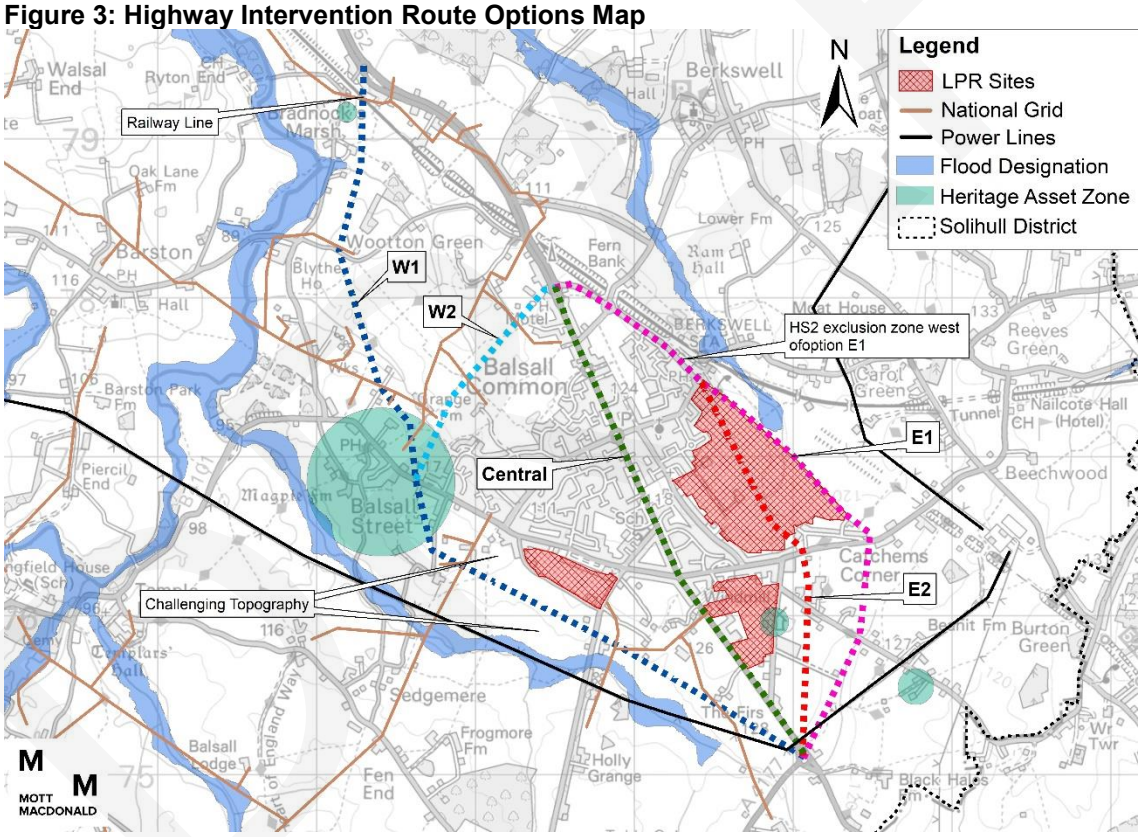
Considering the above, a 'long' list of options for highway intervention was generated across the three broad corridors shown in Figure 2, excluding public transport improvements or demand management options. The details for each of these options are presented in Table 6 and are shown in Figure 3 below.

Table 6: Options Longlist

Corridor	Options	Description
Western	Route W1	Bypass route between the Bradnocks Marsh roundabout and the A452 / A4177 junction
	Route W2	Bypass route between the Hallmeadow Road roundabout and the A452 / A4177 junction
Central (A452)	A452 Increased Capacity	Capacity improvements on the A452 between the Hallmeadow Road roundabout and A4177 / A452 junction
Eastern	Route E1	Bypass route between the Hallmeadow Road / Station Road roundabout and the A452 / A4177 junction via Catchems Corner
	Route E2	Bypass route between the Hallmeadow Road / Station Road roundabout and the A452 / A4177 junction via Barretts Farm

Source: Mott MacDonald

Figure 3: Highway Intervention Route Options Map



Source: Mott MacDonald

4.4 Route Option Rationale

These route options have been identified to fulfil the objectives outlined above, with the key objective being traffic relief to Balsall Common via a route that has minimal environmental impact, is as low cost as possible and achieves some potential to unlock development sites.

Routes were chosen based on connections between key junctions, with the A452 / A4177 junction in the south of the study area considered the southern extremity of each route, whilst the Hallmeadow Road and Bradnocks Marsh Lane roundabouts on the A452 were considered practical as the potential northern extremity.

Each outline route option contains broad assumptions with regards to form, and has been designed to avoid environmental constraints where possible, although this cannot always be achieved. Once a recommendation has been made, the exact route can be considered in more detail and tailored to fit the needs of local stakeholders.

4.5 Summary

Given the nature of the study area and highway intervention required in Balsall Common, there are three broad corridors – east, west and central – that appear to be the most obvious areas for a potential route option. From these, options were produced within these corridors that fit in with the existing highway network and have minimal environmental impact.

Broad assumptions have been made with regards to the design and form. In particularly that they need only be a single carriageway. As shown in Figure 6 and Figure 7 of the previous stage report 'Impact of Future Growth on the Network', DMRB Road Capacities for a 'UAP3' road, described as a 'variable standard road carrying mixed traffic with frontage access, side roads, bus stops and at-grade pedestrian crossings', which we conservatively imagine to be the design standard for such an alignment route, are up to a figure of 1,620 vehicles per hour. This is far higher than the number of vehicles expected to pass along the route, with a figure of 1,073 vehicles for a western bypass and 945 for an eastern bypass, both in the AM peak. Thus, this data suggests that there would be no requirement to build a dual carriageway road, which in reality, would be much more costly, have greater environmental impacts and take up more land.

Indeed, however, once a recommendation has been made, exact routes can be considered in more detail. This is the outcome of the option assessment in the next chapter. Furthermore, a full modelling exercise should be undertaken to categorically assess demand and the capacity that is required.

5 Option Assessment

5.1 Introduction

As stated in Chapter 4, a robust optioneering process has been used in this study to recommend a shortlist of potential route options for a by-pass of Balsall Common, or upgrade of the existing A452 Kenilworth Road. This section outlines the appraisal process undertaken to arrive at a final recommended option.

5.2 Methodology

The methodology for assessing the suitability of the five route options is based upon a multi-criteria assessment using a modified version of Mott MacDonald's Investment Sifting and Evaluation Tool (INSET). INSET is a bespoke information management and decision support toolkit with high functionality that builds on the principles of DfT's EAST (Early Assessment and Sifting Tool). This decision support toolkit has been developed in-house by Mott MacDonald, drawing on standard tools for comparing scheme options, primarily DfT's EAST, and adds functionality to these existing tools to support the evaluation of different options for large-scale investments and investment programmes.

In this case, due to the relatively low number of potential options and criteria being appraised, a full INSET including options being tested against multiple future scenarios was considered unnecessary at this stage. As such, a simplified version has been used here to offer a robust method of assessing options against relevant criteria to ensure selection of the most appropriate option in terms of costs, benefits, deliverability and policy alignment.

No weighting of criteria has been carried out at this stage; i.e. making a judgement that any given criterion should carry more weight than another.

5.3 Development of Assessment Criteria

Assessment criteria has been developed through client engagement and consensus., These have been broken down into three key themes that make up the case for intervention; these are:

- Strategic Theme: strategic fit with local and regional planning, transport and economic policy
- Economic Theme: high-level costing of each option as well as more detailed assessment of each scheme's benefits
- Environmental Theme: assessment of the deliverability of each option considering the numerous environmental constraints within the study area

Sub-criteria were then developed within these key themes, which are discussed further below.

5.3.1 Strategic Theme

This theme assessed the impacts on and considerations given to local and regional planning, transport, and economic policy, with each option being scored against five key criteria. This gave a snapshot of how the options would be expected to perform relative to this theme.

- Alignment with Local Planning Policy (Draft Solihull Local Plan Review (2016) Housing / Employment Strategy)

- Alignment with Local Transport Policy (Draft Solihull Local Plan Review (2016) Transport Policy
- Alignment with Regional Planning Policy (Solihull Connected Delivery Plan (2016 – 2036))
- Alignment with Regional Transport Policy (West Midlands Local Transport Plan 3 (2011 – 2026) / Movement for Growth: The West Midlands Strategic Transport Plan (2016))
- Alignment with Regional Economic Policy (West Midlands Strategic Economic Plan (2016))

5.3.2 Economic Theme

This theme includes a high-level assessment of the engineering cost of each option, as well as the key benefits each would bring to Balsall Common. Each option was scored against three key criteria.

- Engineering Cost
- Traffic Relief to Village Centre
- Unlocking of Development Sites

5.3.3 Environmental Theme

This theme assessed the deliverability of each option with consideration given to key environmental constraints within the study area. This was scored against seven criteria listed below.

- Potential for buildings to be demolished
- Interaction with the railway line
- Impacts on heritage assets
- Impacts on ecology assets
- Flood designations
- Utility networks
- Landscape impact
- Harm to the Green Belt
- Effects on community assets

5.4 Option Costing

High-level costing of each route option was undertaken by qualified quantitative surveyors, with their findings summarised in Table 7 below.

Table 7: High Level Option Costing Summary

Route Option	Point Estimate Total	Estimate Uncertainty[2] (-5%)	Estimate Uncertainty (+ 66%)
W1	£27,081,467	£25,727,394	£44,955,235
W2	£20,229,727	£19,218,241	£33,581,347
Central	£10,153,026	£9,645,375	£16,854,023
E1	£15,738,603	£14,951,673	£26,126,081
E2	£11,616,945	£11,036,098	£19,284,129

Source: Mott MacDonald

[2] These -5% and +66% estimate uncertainties indicate an industry standard tolerance range for high level cost estimates.

The full spreadsheet is available on request, whilst the assumptions and exclusions made in the estimate process are available in Appendix B.

5.5 Option Appraisal

5.5.1 Approach

For the INSET Assessment, options were appraised using a qualitative methodology by suitably qualified and experienced professionals, using objective comparisons and recognised methodologies where possible. Options have been assessed against each criterion on a seven-point scale, measuring impact compared to the existing situation. Impact can be beneficial (in which case the impact gains a positive score) or adverse (whereby the impact is given a negative score). If there is to be no, or negligible impact, the impacts is assessed as neutral. The scoring system is shown below in Table 8.

Table 8: Scoring System

Impact	Score
Large Positive	3
Medium Positive	2
Small Positive	1
Neutral	0
Small Negative	-1
Medium Negative	-2
Large Negative	-3

Source: Mott MacDonald

The appraisal for each option and each criterion has been recorded for objective comparison, with the summary scores detailed in Table 9 below. The full scores for each theme are located in Appendix C.

Detailed justification for these scores is located in Appendix D.

Table 9: INSET Option Scores

Number	Name	Strategic Theme	Economic Theme	Environmental Theme	Summary
1	W1	1.60	0.33	-2.29	-0.35
2	W2	1.60	0.33	-1.71	0.22
3	Central	-1.80	-0.33	-1.00	-3.13
4	E1	1.80	1.33	-1.29	1.85
5	E2	1.40	1.00	-1.14	1.26

Source: Mott MacDonald

5.5.2 Summary of Findings

An appraisal has been undertaken based on outline route options that contain broad assumptions with regards to form. Routes were chosen based on connections between key junctions, with the A452 / A4177 junction in the south of the study area considered the southern extremity of each route, whilst the Hallmeadow Road and Bradnocks Marsh Lane roundabouts on the A452 were considered practical as the potential northern extremity. Each route was chosen to avoid constraints wherever possible, in order to minimise cost and objection amongst local community groups. This is, nevertheless, impossible in some instances.

The study area can be considered as offering three broad corridors, with five route options in total. These are:

- A western corridor between the Bradnocks Marsh Lane roundabout and the A452 / A4177 junction via Balsall Street
- A western corridor between the Hallmeadow Road roundabout and the A452 / A4177 junction via Balsall Street
- A central corridor in which the existing A452 is upgraded to dual carriageway between the Hallmeadow Road roundabout and the A452 / A4177 junction
- An eastern corridor between the Hallmeadow Road roundabout and the A452 / A4177 junction via Catchems Corner
- An eastern corridor between the Hallmeadow Road roundabout and the A452 / A4177 junction via Barretts Farm

Having undertaken this review, our findings can be summarised as follows:

- The two eastern options score best, particularly E1, which runs via Catchems Corner. Engineering costs are lower due to part of this route already being built (Hallmeadow Road), whilst there is also greater potential to unlock development sites, as the proposed Barretts Farm site is close by and any route option could include an access road into the site. Furthermore, the proximity of this route to the proposed Barretts Farm site means there is the possibility of securing funding from housing developers under a Section 106 agreement or part of the necessary highway infrastructure being provided in conjunction with the development.. Both options generally score negatively in terms of environmental constraints but not to an undeliverable degree. Both also have a strong strategic fit with local and regional policy.
- The two western options score averagely, although option W2 is best. Neither score as highly as either of the two eastern options. Both have a strong strategic fit with local and regional policy, and provide marginally more traffic relief to the village centre based on the through-traffic analysis summarised in Chapter 3.2. However, both are more costly due to being longer routes and also come into contact with more environmental constraints, particularly the longer route W1.
- The central option scores very poorly for a number of reasons. Whilst it scores the best from an environmental perspective due to this route being built already in single-carriageway form, this option fails to address the issue of traffic in the village centre, which is why this study has been commissioned. Building additional carriageway capacity through the village would also have a deleterious impact on the public realm and be unsustainable in its design, meaning it does not fit with local or regional planning and transport policy.

6 Option Recommendation and Next Steps

6.1 Option Recommendation

Based upon the assessment process outlined in this chapter, Option 4, or Route E1, should be progressed to full design appraisal stage. This scored the highest of all the options as Table 9 shows, and would cause the least disruption to the highway network in its construction.

Although this has not been explored in detail within this report, it would also be possible to accompany any bypass route with a downgrade of the existing A452 through Balsall Common. This would improve the public realm within the village and feed directly into the strategic planning objectives outlined within this report. Downgrade options could include:

- Traffic calming / public realm improvements
- Widened pedestrian footways
- Cycleways
- Greater public transport provision

Full design appraisal would allow Option 4 (Route E1) and any accompanying A452 downgrade to be assessed in more detail, resulting in a full preliminary design appraisal with junctions modelled and full highway impacts assessed. We believe this is the best option to allow Solihull MBC to achieve its objectives for Balsall Common of traffic relief to the village centre, the unlocking of development sites and minimal environmental impact.

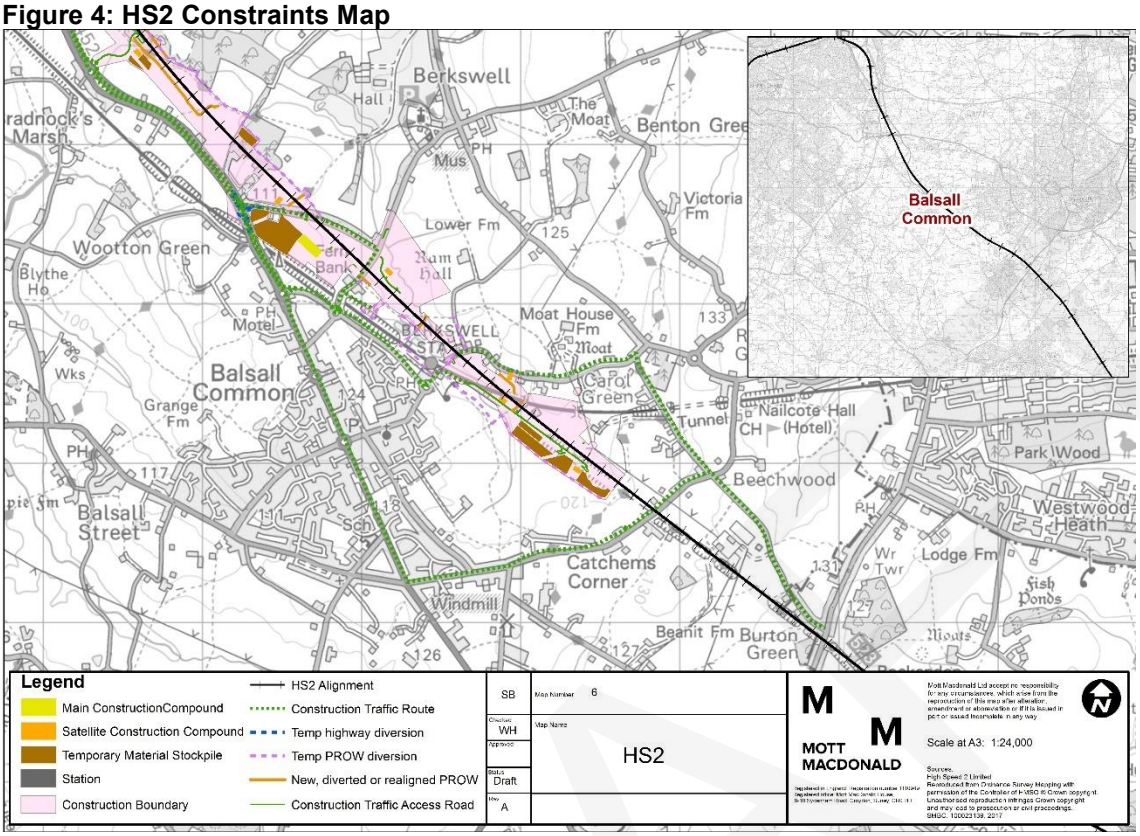
Chapters 6.2 and 6.3 will now consider the fit of this route in relation to HS2 and the 2012 Solihull SHLAA, evidencing that this route does not negatively interact with planned development in any way.

6.2 HS2 Environmental Statement

Figure 4 below exemplifies that Option 4 (Route E1) does not interfere with the HS2 Construction Boundary. Route E1 will run parallel with the south-western extremity of the construction boundary between Hallmeadow Road and Waste Lane before turning directly south to join with the A452 / A4177 junction.

A full traffic management plan must be formulated to ensure the surrounding highway network can run as efficiently as possible in any case, but particularly so if these two major developments within the local area coincide.

Figure 4: HS2 Constraints Map



Source: HS2 London – West Midlands Environmental Statement Volume 2 CFA 23 (Balsall Common and Hampton-in-Arden)

6.3 Solihull SHLAA (2012) Representations

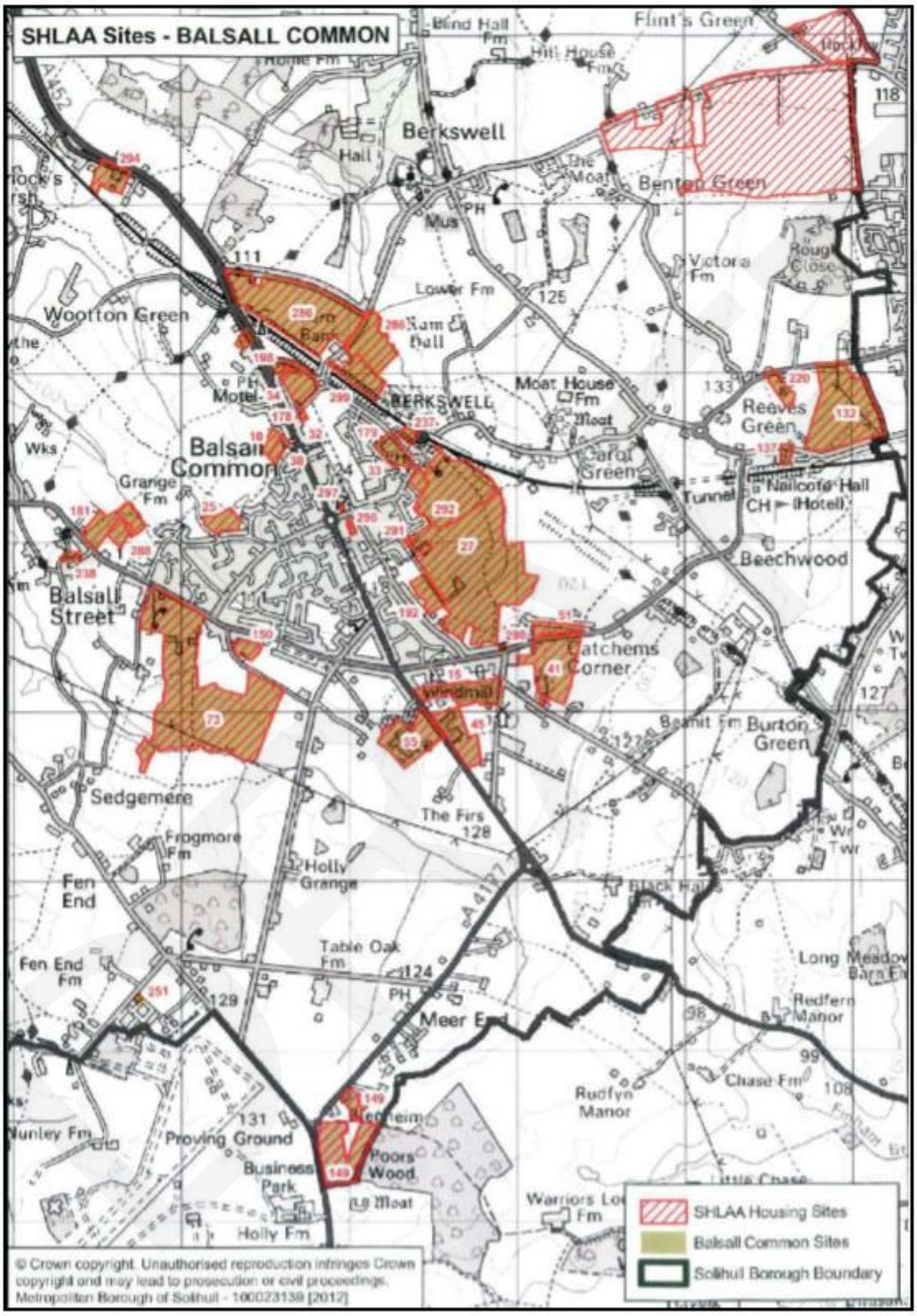
The 2012 Solihull Strategic Housing Land Availability Assessment (SHLAA) identified 35 potential sites in Balsall Common, shown in Figure 5 below. Five of these are in the vicinity of the recommended bypass route; these are:

- Site 27: Barretts Lane Farm
- Site 41: Land at Pheasant Oak Farm
- Site 51: Land at Waste Lane
- Site 292: Part of Barretts Lane Farm, Station Road
- Site 298: Kelsey Lane, opposite Windmill Lane

Only Site 298 was recommended for inclusion in the SHLAA or 2013 Solihull Local Plan, although Barretts Lane Farm (now referred to as Barretts Farm) was also included in the 2016 Draft Local Plan Review.

Route E1 will skirt the edge of the proposed Barretts Farm site, whilst it could also help to unlock the aforementioned sites through providing a barrier to unconstrained growth outside of the settlement. This is particularly apt in the case of Site 41, which lies directly west of the proposed section of route between Waste Lane and Hob Lane near Catchems Corner.

Figure 5: Balsall Common SHLAA Sites



Source: Balsall Common – SHLAA Site Assessments (2012)

6.4 Next Steps

Following the outline recommendation made in this report for SMBC to choose Option 4 (Route E1) as its preferred highway alignment, it is now crucial that this process does not stall and instead gathers momentum, particularly considering the highway issues that Balsall Common is likely to experience through the multiple planned developments occurring in the wider area.

Further design work may be required to develop option detail, to ultimately inform a corridor that could be designated, in the Council's Local Plan, as a formal Improvement Line. In tandem, a Strategic Outline Business Case should be developed to enable SMBC to secure funding for this vital scheme.

A. Bypass Route Analysis Technical Note

A.1 Introduction

The aim of this technical note is to provide a concise gathering of engineering constraints for each of the three defined 'route areas' for a bypass to Balsall Common town centre. This technical note will enable the route areas to be carefully refined and identify a suitable corridor for route options to be developed within.

The A452 Kenilworth Road forms a direct link between the A5 at Chasewater Country Park and Royal Leamington Spa. More locally to Balsall Common, it links M42 Junction 6 (Airport, NEC etc) and Kenilworth, running directly through Balsall Common town centre as a two-way single carriageway. The volume of traffic through Balsall Common is a local concern with the added pressures of HS2 construction traffic and infrastructure, including new homes in the surrounding areas, further adding to the problem.

A.2 Route Areas

Three route area options have been established and consider:

1. A bypass to the west.
2. A bypass to the east.
3. An upgrade to the existing A452 through Balsall Common.

The west option is approximately 6km long and considers a route from the A452 roundabout at Bradnocks Marsh Lane, curving to the south then southeast to the A452 junction with the A4177. The east option is approximately 4.5km long and runs between the A452 roundabout with Hallmeadow Road, curving to the south the A452 roundabout with the A4177, utilising Hallmeadow Road. The upgrade of the existing A452 considers the entire stretch of carriageway between Bradnocks Marsh Lane roundabout and the A4177.

The area surrounding Balsall Common town centre is entirely within Green Belt Land, therefore all route options interface the green belt for some, or generally most of their length.

For the purpose of this report it is assumed, where possible, the route options should be grade-separated where they encounter existing roads to reduce journey times. This however will depend on traffic flows, environmental impact, cost and is subject to optioneering at a later stage.

A.3 West Route Option

The north end of the west route option is at an elevation in the order of 98m. As it curves and starts to head southeast it generally slopes gently to an elevation of 110m over approximately 3km. The contours indicate that an elevation change occurs more rapidly in the area to the southwest of Balsall Common, in the vicinity of Fernhill Lane. From this point onwards, to the end of the route, the contours suggest that the land gently slopes in a southerly direction and meets the A452 / A4177 junction at an elevation of between 105m and 110m.

A brook runs in a southeast to northwest direction and feeds into the River Blythe approximately 2.5km west of Balsall Common town centre. This brook is noted to have a flood zone 3 area and intersects the west route option at Fernhill Lane until it reaches the A452 / A4177 junction.

The River Blythe's flood zone 3 area interfaces with the west route option on Bradnocks Marsh Lane, where the river Blythe takes a sharp left turn towards West Midlands golf club.

Overhead power lines and associated pylons run in a northwest-southeast direction and interface the west route option in the same position as the brook flood zone area. A pylon is located approximately 100m to the west of the A452 / A4177 junction's western-most point.

The west route option crosses a number of roads of varying grade and status, which are listed below (listed north – south):

1. Interface with Bradnocks Marsh Lane at the roundabout with A452. Bradnocks Marsh Lane is a two-way single carriageway B-road that runs for approximately 1.25km long and runs in a north-south direction until it becomes Barston Lane (south) at a crossroads with Barston Lane (west) and Wootton Lane to the east. Bradnocks Marsh Lane and Barston Lane (south) form a link between the A452 and the B4101 Balsall Street. Approximately 150m southwest from the junction with A452, Bradnocks Marsh Lane passes under the West Coast Mainline in a narrow, 12 foot high brick arch structure. The lane has a 40 mph speed limit.
2. Wootton Lane, a narrow, two-way, hedgerow and mature tree-lined rural lane with a 40 mph speed limit. The lane runs between Bradnocks Marsh Lane and the A452 north of Balsall Common town centre. The lane climbs to a crest in the vicinity of the 90 degree curve approximately 400 metres to the east of the junction with Bradnocks Marsh Lane.
3. B4101, Balsall Street. The west route option crosses both 40mph and 30mph areas on Balsall Street, with the latter commencing on the entry to Balsall Common adjacent to Barn Close. Balsall Street consists of a two-way single carriageway carriageway with a footway and verges on the northern side. The southern side has fairly dense hedgerows between properties.
4. Magpie Lane, a narrow single-track, two-way lane that slopes down to the south from the B4101 Balsall Street. It has a national speed limit and serves a number of farms.
5. Saracen Drive is a modern housing estate cul-de-sac sitting to the southeast of Magpie Lane. It is approximately 200 metres long and is positioned to the southwest of B4101.
6. Fernhill Lane lies to the southeast of B4101 and is a narrow, two-way single-track lane. It is lined with high, dense hedgerows and has limited passing places for motor vehicles. The midpoint of the lane has two sharp hairpin bends around farm buildings and access points. The north side of these bends is relatively flat, whilst the southern side slopes down towards Fen End.
7. The route crosses relatively flat fields and meets Holly Lane, which is a straight two-way single lane carriageway on a north-south orientation with a national speed limit. There are grass verges, hedgerows and mature trees on both sides of the carriageway and the road slopes towards the north in the area of the west route option. Overhead powerlines and pylons also cross Holly Lane in the immediate vicinity.

There are a number of signed public footpaths within the route option area and its environs, most notably The Heart of England Way which runs between Wotton Green Lane (off the A452) and Balsall Street, running parallel to Wootton Lane.

There are a number of significant parcels of land within the west route option path. The most notable are listed, from north to south, below:

a) On the land bound by the A452 and the West Coast Mainline - car sales garages, car spares yard, garden centre, farms.
b) West Coast Mainline – running parallel to the A452 until it they converge and the road passes over 'Skew bridge' to the east. The West Coast Mainline is located

approximately 150 metres from the A452 roundabout with Bradnocks Marsh Lane at a higher level.

c) Magpie Cottage, Bradnocks Marsh Lane – Grade II listed building.
d) The Templars, B4101 Balsall Street – Grade II listed building.
e) The Saracen's Head Inn, B4101 Balsall Street – Grade II listed building.
f) The Old Farmhouse, Magpie Lane – Grade II listed building.
g) Magpie Farmhouse, Magpie Lane – Grade II* listed building.
h) Howlett's Farmhouse, Fernhill Lane – Grade II listed building.
i) Local Wildlife Centre, on land bound by Fernhill Lane, Fen End Road and Holly Lane.
j) Cottage Farmhouse, Holly Lane – Grade II listed building.
k) The Grange, Frog Lane – Sports activity centre.
l) West Midlands Police Dog Training Centre, Holly Lane
m) Glendale Farm, A452 Kenilworth Road.

The land bound by Balsall Street and Frog Lane has been identified for a potential housing development site. The west route option faces a number of engineering and land ownership challenges, which could be further compounded by sensitivities to the proximity to listed buildings and severance of rural roads and farmland.

The main constraint is the proximity to the West Coast Main Line. It is likely that a new road would need to pass under the railway given its position on an embankment, unless a realignment of the A452 and associated new junction adjacent to the car sales and garden centre could provide an opportunity to carry the new road on an overbridge. This is unlikely to be cost-effective and would require extensive negotiations with Network Rail and land purchasing consultants.

To the south is the B4101 Balsall Street crossing which may require overbridging. This would have a negative impact on the nearby listed Saracen's Head Inn and local housing estates. Fernhill Lane and Frog Lane would also need overbridging given the threshold constraints of the local farm houses and access points. Lying between Fernhill Lane and Frog Lane is the line of overhead powerlines and pylons which would need to be relocated to accommodate a bypass. This is likely to be a very expensive procedure. This area is also on a flood zone 3 area so should be subject to a flood risk assessment during optioneering design stages.

The west route continues to follow the overhead powerlines to the A4177 junction, via the West Midlands Police Dog Training Centre. Any possible route should seek to avoid this land, although farms, businesses and private properties exist to the north and south.

The A452/A4177 junction would need to be converted into a four-arm roundabout to make the junction suitable for all traffic movements.

A.4 East Route Option

The north end of the east route option encompasses Hallmeadow road, the roundabout junction with Lavender Hall Lane, Lavender Hall Park, the West Coast Mainline and Berkswell Station. This area lies at an elevation of between 105 and 110 metres. As the route area gently curves to the south, the elevation generally remains closer to 110 metres, rises to 120 metres at Catchems Corner before meeting the A452 / A4177 junction at an elevation of between 105m and 110m. it is therefore assumed at this stage that no vertical alignment issues would be expected for this route.

The east route option path encounters a flood zone 3 area on Station Road to the northeast of Berkswell station and follows a brook to the south in the vicinity of the disused rail line spur north of where Kelsey Lane and Waste Lane meet to the west of Catchems Corner.

Overhead powerlines are situated to the northeast of the A452 Kenilworth Road, with two pylons present within the east route option path in the field between the A452 and Hob Lane.

The east route option interfaces a number of roads of varying grade and status, which are listed below (listed north – south):

1. There is a three arm roundabout junction of the A452 and Hallmeadow Road. To the north, the A452 is a dual carriageway and to the south the A452 enters Balsall Common town centre as a two-way single carriageway. Hallmeadow Road curves to the southeast around Balsall and Berkswell Hornets Football Club for approximately 300 metres along a two-way single carriageway 30 mph carriageway until it meets a four arm roundabout junction with Lavender Hall Lane.
2. South of this roundabout, Hallmeadow Road continues to gently curve to the southeast along a two-way single carriageway. The road is traffic-calmed with junction tables at two side-roads to the west; Grovefield Crescent and Riddings Hill, which are routes into a housing estate. Hallmeadow Road joins a three-arm roundabout with Station Road. Hallmeadow Road has grass verges and a footway/cycleway on the southwest side for its entirety. There are crossing points for pedestrians and cyclists at all arms on both roundabouts. The land to the southwest of Hallmeadow Road is classed as Amenity Open Space and SSSI.
3. Station Road runs on a southwest-northeast orientation and serves Berkswell Station to the north and Balsall Common town centre to the southwest.
4. The east route option next meets Waste Lane to the west of Catchems Corner. Old Waste Lane is set-back from Waste Lane for its 400 metre length and Waste Lane forms a short bypass around the tight, narrow nature of Old Waste Lane, which serves a number of high-value properties. Verges, mature hedgerows and scrubland separate the two carriageways. The east route option encompasses a 30 mph and 40 mph section of Waste Lane.
5. To the south of Waste Lane is Hob Lane which runs on a straight northwest-southeast orientation. Hob Lane is a two-way single carriageway rural lane with narrow grass verges lined with mature hedges and trees. It slopes gently west to east and has a national speed limit.

There are a number of signed public footpaths within the east route option path. Just outside the path, to the southeast of Berkswell station is the Kenilworth Greenway, which runs along a disused rail line spur from the West Coast Mainline.

There are a number of significant businesses and properties within the east route option path. The most notable are listed, from north to south, below:

a) Balsall and Berkswell Hornets Football Club.
b) Lavender Hall Park (A Site of Special Scientific Interest [SSSI])
c) Lavender Hall Farmhouse and Barn, Lavender Hall Lane – Grade II* listed buildings.
d) Berkswell Station.
e) Balsall Common Health Centre, Hallmeadow Road.
f) The Brickmakers Arms Public House, Station Road – Grade II listed building.
g) High value properties on Old Waste Lane and Windmill Lane.
h) Camp Farm, Hob Lane.
i) Berkswell Windmill, Windmill Lane – Grade II* listed building.
j) Windmill Park, Windmill Lane
k) Evesons Fuel, A452 Kenilworth Road.

Two pockets of land have been identified for a potential housing development site, which are:

1. The land bound by Meeting House Lane, Kelsey Lane, Waste Lane and Station Road. The northeast boundary is indicated as being a straight line between the Station Road/Hallmeadow Road roundabout and the eastern-most point of Old Waste Lane. The east route option curves through this land.
2. The triangular land bound by Kelsey Lane, A452 and Windmill Lane.

The potential housing development in Note 1 is within green belt and, if constructed, could therefore lessen the impact of the east bypass route on the green belt which passes directly parallel to the development.

HS2 is proposed to cross over Waste Lane, utilise the disused rail line spur, now used for the Kenilworth Greenway, cross the West Coast Main Line and pass to the north of Berkswell Station. A construction material compound is proposed to be located between the proposed housing estate and the Kenilworth Greenway.

The east option is constrained in the north by the West Coast Main Line, which runs parallel to Hallmeadow Road in a deep cutting to the northeast, and. As the route follows Hallmeadow Road towards Berkswell station, the route is further constrained by the housing estate to the south. This existing corridor, between the junction with the A452 and Station Road would be utilised for bypassing Balsall Common and there is an opportunity to investigate the carriageway's suitability for converting to dual carriageway. This would be subject to an assessment on loss of trees and proximity to the Amenity Open Space directly to the southwest. It is recommended that the pedestrian and cycle infrastructure is retained in the options to ensure sustainable transport links to Berkswell station. The existing traffic calming measures would need to be removed and Traffic Regulation Orders imposed along the route to prevent parking adjacent to Balsall Common Health Centre.

Old Waste Lane is home to approximately 25 residential properties which the east route option should avoid in order to reduce the land purchasing costs as well as visual and noise impact to local residents. Similarly, the interface with Hob Lane should look to provide adequate access to local farms and nearby properties. Both Old Waste Lane and Hob Lane should be evaluated on cost and environmental impact of grade separation or at-grade junctions with the bypass. The A452/A4177 junction would need to be converted into a four-arm roundabout to make the junction suitable for all traffic movements. There is potentially scope to move the junction to the north or to the west to avoid impact on Evesons Fuel, although further land owners of the farmland adjacent would likely be more affected.

In order to ensure the bypass is utilised and traffic is directed away from the A452 through Balsall Common, it is suggested that options are developed to discourage motorists from choosing the A452 route. This includes, but is not limited to: 'downgrading' the status of the A452 through Balsall Common; use of signs and paving materials to give the appearance of an unsuitable route for through-traffic; narrowing and traffic-calming measures.

A.5 Central Route Option

The central route option considers the route of the A452 through Balsall Common town centre, from the roundabout at Bradnocks Marsh Lane junction in the north to the roundabout with the A4177 in the south. The A452 corridor through Balsall Common town centre is a straight two-way single carriageway with right turn lanes running along the centre and traffic calming measures such as central hatched road markings and central pedestrian refuges. It has a 30mph speed limit for its entirety. The road is lined with narrow grass verges and footways. The corridor generally has a constant width of approximately 18 metres between property boundaries. To the south of Kelsey Lane, the A452 enters a more rural area and slopes down

to a low point in elevation adjacent to Glendale Farm. From here the road gently climbs back up to the junction with the A4177, meeting farm and field access points along the way. This road serves a main route for local bus services for its entirety.

No watercourses cross the A452 through Balsall Common town centre and none of the central route option falls within a flood zone.

The A452 has a number of small junctions and side roads along its route through Balsall Common and are listed as follows (from north to south):

1. Wootton Green Lane – a narrow traffic calmed residential lane unsuitable for HGVs. There are raised footways on both sides.
2. The Paddocks – a narrow private road leading to three abodes and a public footpath.
3. Lavender Hall Road sits directly opposite the Paddocks. It is a two-way single carriageway rural road with a footway on the northern side. It serves Balsall and Berkswell Hornets Football Club and Lavender Hall park. It has a 2.0 metre vehicle width restriction.
4. A four arm roundabout junction with Dengate drive and Chapel Drive, both of which are residential streets. Chapel Drive is a short cul-de-sac and Dengate Drive leads into a housing estate to the southwest.
5. Hathaway Close – a short cul-de-sac to the east of the A452.
6. Turnpike Close - a short cul-de-sac to the east of the A452.
7. A four-arm roundabout with Station Road. The northern approach has a pelican crossing in advance of the junction. All four approaches to this roundabout are lined with businesses.
8. Arden Close - a short cul-de-sac to the west of the A452.
9. Leveson Crescent – a residential street to the west of the A452.
10. Gipsy Lane – a straight two-way single carriageway residential street running on a southwest-northeast orientation. It serves several local bus services and the Heart of England School.
11. A signal controlled crossroads with Alder Lane and Kelsey Lane. The junction extents are bound by private property boundary walls, mature trees and hedgerows.
12. Windmill Lane – a rural, two-way single carriageway 40mph lane with narrow grass verges, no footways and lined with mature trees and hedgerows. It runs on a north-south orientation and is therefore accessed via a tight left turn from the north.

There is limited scope to increase capacity along the existing A452 carriageway due to the constraints imposed upon the corridor width in Balsall Common town centre between properties and the interface with the existing junctions and side roads. There is scope to widen the A452 between the Alder Lane/Kelsey Lane crossroads and A4177 junction but this would not relieve the pressure on the network through Balsall Common where grade-separated junctions or side road closures are not possible. There is limited scope to upgrade the signal controlled crossroads with Alder Lane and Kelsey Lane due to the space constraints.

A.6 Conclusion

The west route should be investigated further to ascertain if route options can be developed that account for the position of the West Coast Main Line, listed buildings, flood zones and overhead powerlines and challenging topography. Similarly, the east route can be developed into several options that utilise Hallmeadow Road and consider the surrounding developments of the housing estate and HS2 infrastructure. The topography appears to be better suited to threading bypass options across Holly Lane, but impacts on residents will need to be considered. The

A452 ‘upgrade’ option does not seem feasible but in order to provide robust optioneering an option should be prepared to form a thorough comparative exercise.

B. Bypass Route High Level Costing

B.1 Assumptions & Exclusions

B.1.1 Assumptions - General

1 Estimate is based at 3Q17 (no inflation has been allowed for beyond this time)
2 Estimate uncertainty level is +66% / -5%
3 The estimate is based on it being possible to undertake the majority of the work during normal midweek days with un-restricted access. A nominal uplift has been applied to cover any night time or out of hours working that may be required. Refer to the estimate for details
4 Allowances have been included where we have not received sufficient information to allow us to price the works confidently within the estimate +/-% range. These have been clearly identified in the estimate and will require validation when further information becomes available
5 An allowance has been included in the estimates to cover any haul roads which may be required, this is based on them being 0.5m deep and consisting of compacted granular material
6 All drainage requirements have been assumed or are allowances. Refer to the estimates for details
Existing carrier and connector drains in existing roads to be retained and connected into new gullies provided per road widening. Capacity will be sufficient for the aditional run off
7 All arisings are inert unless stated otherwise. The estimate is based on any excavated materials being disposed of off site (including topsoil)
8 Existing ground level is approximately the same as finished construction levels (e.g. carriageway excavation to be generally the same as the construction depth).
9 Road widths are 7.3m for a single carriageway. Existing roads for re-use will be widened to 14.6m
10 Drainage to new roads has been allowed for
11 Footpath construction made up of 175mm type 1 sub base, 50mm binder course and 25mm surface course
12 Allowance of 10,000m3 of cut to fill made for W1, W2, E1 and E2 only
13 No soft spots under formation level
14 New road construction consists of 500mm capping layer, 500mm Type 1 sub-base, 200mm base course, 60mm binder course and 40mm wearing course
15 No demolition of any existing structures is required
16 Allowances included for white lining and signage
17 No allowance has been made for landscaping to verges and roundabouts
18 See estimates and rates sheet for further assumptions and details of scope
19 Given the level of detail provided, it is not possible to quantify the extent of utilities to be relocated, protected or diverted. Costs for diversions can be extremely volatile and as such are very difficult to derive, and as such have been excluded from these estimates
20 Lengths and measures of roads provided by designers are correct (these have been taken from report and not measured from the drawings)
21 See summary for indirect cost and/or other on cost provisions
22 Embankments for bridges measured at 6m high and 10m in width to allow for future development

B.1.2 Assumptions – Site Specific

B.1.2.1 W1

1. One bridge over railway provided
2. Two bridges have been provided over roads Fernhill Ln and Wootton Ln
3. Allowances have been made for diverting existing streams into culverts
4. No footpaths provided
5. No street lighting has been provided
6. Traffic management has been placed in the estimate at 5%

B.1.2.2 W2

1. Two bridges have been provided over roads Wootton Green Ln and Fernhill Ln
2. No footpaths provided
3. No street lighting has been provided
4. Allowances have been made for diverting existing streams into culverts
5. Traffic management has been placed in the estimate at 5%

B.1.2.3 Central

1. Footpath allowed for full length of existing road
2. Street lighting placed at 30m staggered centres has been included to replace existing
3. Four 3 way signalised junctions have been included in the estimate
4. Existing road to be planed off and resurfaced
5. The slack within the cables for utilities is sufficient for them to be slewed
6. Safety barriers have been included as an allowance at each new junction
7. Existing road width is 9.5m
8. Traffic management has been placed in the estimate at 10%

B.1.2.4 E1

1. Existing road to be planed off and re-surfaced between Station Rd and the A452
2. Extra 1.5km new road has been added for northern and southern access to new development
3. Footway has been allowed for to accommodate the new northern and southern access for future development
4. One bridge included over Hob Ln
5. No street lighting has been provided
6. Allowances have been made for diverting existing streams into culverts
7. Traffic management has been placed in the estimate at 5%

B.1.2.5 E2

1. Existing road to be planed off and re-surfaced between Station Rd and the A452
2. Footway has been allowed for future development area estimated 1.2km in length
3. One bridge included over Hob Ln
4. No street lighting has been provided
5. Allowances have been made for diverting existing streams into culverts
6. Traffic management has been placed in the estimate at 5%

B.1.3 Exclusions – General

1 Optimism Bias
2 VAT
3 3rd party compensation costs
4 Planning and approval charges
5 Land purchase or rental
6 Costs associated with Statutory Fees (e.g. HMRI, Local Authority, etc.)
7 Costs associated with taxes, levies and licenses
8 Costs associated with changes in legislation and any form of applicable standards
9 Allowances for unforeseen ground conditions / provisions for ground stabilisation unless specifically identified
10 Christmas, Easter and Bank Holiday working
11 Environmental mitigation works
12 Archaeological digs
13 Inflation beyond the base date
14 Utilities diversions, relocation and protection
15 Re-location of affected businesses
16 Retaining walls or structures unless specifically identified
17 Demolition to any existing structures
18 All works to existing railway
19 Tree schedule/planting

C. INSET Scores

C.1 Strategic Theme

Table 10: Strategic Theme – Policy Alignment Scoring

1A. STRATEGIC THEME - POLICY ALIGNMENT

No.	Name	Alignment with Local Planning Policy	Alignment with Local Transport Policy	Alignment with Regional Planning Policy	Alignment with Regional Transport Policy	Alignment with Regional Economic Policy	AVERAGE
1	W1	1.00	2.00	1.00	1.00	3.00	1.60
2	W2	1.00	2.00	1.00	1.00	3.00	1.60
3	CENTRAL	-2.00	-3.00	-3.00	-2.00	1.00	-1.80
4	E1	3.00	1.00	1.00	2.00	2.00	1.80
5	E2	1.00	1.00	1.00	2.00	2.00	1.40

C.2 Economic Theme

Table 11: Economic Theme – Costs and Benefits Scoring

1B. ECONOMIC THEME - COSTS & BENEFITS

No.	Name	Engineering Cost	Traffic Relief to Village Centre	Unlocking of Development Sites	AVERAGE
1	W1	-3.00	3.00	1.00	0.33
2	W2	-2.00	2.00	1.00	0.33
3	CENTRAL	-2.00	-3.00	1.00	-0.33
4	E1	-2.00	2.00	3.00	1.33
5	E2	-3.00	1.00	2.00	1.00

C.3 Environmental Theme

Table 12: Environmental Theme – Constraints and Deliverability Scoring

1C. ENVIRONMENTAL THEME - CONSTRAINTS & DELIVERABILITY

No.	Name	Potential for buildings to be demolished	Interaction with Railway Line	No. of listed buildings in vicinity	Flood Zones	Utilities	Landscape Impact	Green Belt	AVERAGE
1	W1	-3.00	-3.00	-3.00	-1.00	-3.00	-2.00	-3.00	-2.29
2	W2	-2.00	0.00	-2.00	-1.00	-2.00	-2.00	-3.00	-1.71
3	CENTRAL	-3.00	0.00	0.00	0.00	-1.00	-2.00	-1.00	-1.00
4	E1	-1.00	0.00	-1.00	-1.00	-1.00	-2.00	-3.00	-1.29
5	E2	-1.00	0.00	-1.00	0.00	-1.00	-1.00	-3.00	-1.14

D. Scoring Justification

D.1 Strategic Case

2B. SCORING JUSTIFICATION

		ROUTE OPTION				
	CRITERIA	W1	W2	CENTRAL	E1	E2
STRATEGIC CASE	Alignment with Local Planning Policy	1: Deemed small positive fit due to the scheme's ability to accommodate through traffic, although this will provide limited access to new developments	1: Deemed small positive fit due to the scheme's ability to accommodate through traffic, although this will provide limited access to new developments	-2: Deemed medium negative fit due to this scheme not being an alternative route that would also provide only limited access to new developments	3: Deemed large positive fit due to the scheme's ability to accommodate through traffic and provide access to the proposed Barretts Farm site via access roads	1: Deemed small positive fit due to the scheme's ability to accommodate some through traffic and provide direct access to the proposed Barrett's Farm site, which would in turn limit speeds and therefore limit capacity / take-up
	Alignment with Local Transport Policy	2: Deemed medium positive fit as the scheme will relieve more traffic from the village centre than an eastern by-pass but this must be accompanied by complementary downgrading of the A452 to provide better active modes infrastructure	2: Deemed medium positive fit as the scheme will relieve more traffic from the village centre than an eastern by-pass but this must be accompanied by complementary downgrading of the A452 to provide better active modes infrastructure	-3: Deemed large negative fit as the scheme will increase traffic levels through the village centre, making it less integrated and attractive to walk or cycle	1: Deemed small positive fit as the scheme will relieve less traffic from the village centre than a western by-pass but this must be accompanied by complementary downgrading of the A452 to provide better active modes infrastructure	1: Deemed small positive fit as the scheme will relieve less traffic from the village centre than a western by-pass but this must be accompanied by complementary downgrading of the A452 to provide better active modes infrastructure
	Alignment with Regional Planning Policy	1: Deemed small positive fit due to the scheme's ability to accommodate traffic growth, although complementary downgrading of the A452 will be required to enhance public realm and the place function of the village centre	1: Deemed small positive fit due to the scheme's ability to accommodate traffic growth, although complementary downgrading of the A452 will be required to enhance public realm and the place function of the village centre	-3: Deemed large negative fit as the scheme will increase traffic levels through the village centre, diminishing the attractiveness of the public realm and the place function of the village centre	1: Deemed small positive fit due to the scheme's ability to accommodate traffic growth, although complementary downgrading of the A452 will be required to enhance public realm and the place function of the village centre	1: Deemed small positive fit due to the scheme's ability to accommodate traffic growth, although complementary downgrading of the A452 will be required to enhance public realm and the place function of the village centre
	Alignment with Regional Transport Policy	1: Deemed small positive fit as a bypass route is given running to the east of the village centre in the West Midlands LTP3, but a western bypass route could also improve existing infrastructure capacity and tackle a key travel problem within the region	1: Deemed small positive fit as a bypass route is given running to the east of the village centre in the West Midlands LTP3, but a western bypass route could also improve existing infrastructure capacity and tackle a key travel problem within the region	-2: Deemed medium negative fit as the scheme would improve existing infrastructure capacity but would also inhibit clean air, improved health and quality of life within Balsall Common, key regional transport priorities	2: Deemed medium positive fit as a bypass route is given running to the east of the village centre in the West Midlands LTP3, which could improve existing infratsructure capacity and tackle a key travle problem within the region	2: Deemed medium positive fit as a bypass route is given running to the east of the village centre in the West Midlands LTP3, which could improve existing infratsructure capacity and tackle a key travle problem within the region
	Alignment with Regional Economic Policy	3: Deemed large positive fit as such a scheme would improve regional access and connectivity between key centres of housing, employment and education, with more take-up of a western by-pass route	3: Deemed large positive fit as such a scheme would improve regional access and connectivity between key centres of housing, employment and education, with more take-up of a western by-pass route	1: Deemed small positive fit as such a scheme would improve regional access and connectivity between key centres of housing, employment and education, but this would be in an unsustainable manner that worsens access for other user groups than vehicle drivers	2: Deemed medium positive fit as such a scheme would improve regional access and connectivity between key centres of housing, employment and education, with less take-up of an eastern by-pass route	2: Deemed medium positive fit as such a scheme would improve regional access and connectivity between key centres of housing, employment and education, with less take-up of an eastern by-pass route

D.2 Economic Case

2B. SCORING JUSTIFICATION

		ROUTE OPTION				
	CRITERIA	W1	W2	CENTRAL	E1	E2
ECONOMIC CASE	Engineering Cost	-3: Deemed large negative fit as this scheme has been estimated to cost just over £27 million, the highest of all the options	-2: Deemed medium negative fit as this scheme has been estimated to cost just over £20 million, the second highest of all the options	1: Deemed small positive fit as this scheme has been estimated to cost just over £10 million, the lowest of all the options	-1: Deemed small negative fit as this scheme has been estimated to cost just under £15 million, the third highest of all the options	0: Deemed neutral fit as this scheme has been esitimated to cost just under £12 milion, the second lowest of all the options
	Traffic Relief to Village Centre	3: Deemed large positive fit as a western by-pass route would take more traffic than an eastern route, with this longer, sweeping design also relieving traffic from the A452 north of the Hallmeadow Road roundabout	2: Deemed medium positive fit as a western by-pass would take more traffic than an eastern route, but this design would be less direct than Option W1, potentially making it less popular than using the current A452 without complementary downgrading	-3: Deemed large negative as this would have the opposite effect, increasing traffic numbers through the village centre	2: Deemed medium positive fit as an eastern by-pass route would take less traffic than a western route, but this option's design would have seamless integration with the existing road network and could be a higher speed and capacity than Option E2	1: Deemed small positive as an eastern by-pass route would take less traffic than a western route, and this option would have to be built at low speed/capacity due to its routing through the proposed Barretts Farm site
	Unlocking of Development Sites	1: Deemed small positive fit as this route could potentially give rise to access to the proposed Frog Lane site, a small development of 150 homes	1: Deemed small positive fit as this route could potentially give rise to access to the proposed Frog Lane site, a small development of 150 homes	1: Deemed small positive fit as this route could potentially improve access to the proposed Windmill Lane site, a small development of 200 homes	3: Deemed large positive fit as this route could provide access to the proposed Barretts Farm site, a large development of 800 homes	2: Deemed medium positive fit as this route could provide direct access to the proposed Barretts Farm site, but would involve land take reducing the development from its current proposed total of 800 homes

D.3 Environmental Case

2B. SCORING JUSTIFICATION

		ROUTE OPTION				
	CRITERIA	W1	W2	CENTRAL	E1	E2
ENVIRONMENTAL CASE	Potential for buildings to be demolished	-1: Deemed small negative fit as this scheme has the potential for a small number of buildings to be demolished near the Bradnocks Marsh Lane roundabout	-2: Deemed medium negative fit as this scheme has the potential for several buildings to be demolished near the Bradnocks Marsh Lane roundabout	-3: Deemed medium negative fit as this scheme has the potential for buildings to be demolished along the route, particualrly at the Hallmeadow Road roundabout, A452 / Kelsey Lane / Alder Lane and A452 / A4177 junctions	-1: Deemed small negative fit as this scheme has the potential for a small number of buildings to be demolished near Waste Lane and at the A452 / A4177 junction	-2: Deemed medium negative fit as this scheme has the potential for several buildings to be demolished between Waste Lane and Hob Lane and at the A452 / A4177 junction
	Interaction with Railway Line	-3: Deemed large negative fit as this route would involve either tunnelling under or bridging over the existing West Coast Main Line, and would be adjacent to the HS2 Construction Compound	0: Deemed neutral fit as this route does not interact with the railway line	0: Deemed neutral fit as this route does not interact with the railway line	0: Deemed neutral fit as this route does not interact with the railway line	0: Deemed neutral fit as this route does not interact with the railway line
	No. of listed buildings in vicinity	-3: Deemed large negative fit as this route passes very close to multiple listed buildings in the Balsall Street area, as well as one at Bradnocks Marsh Lane	-2: Deemed medium negative fit as this route passes very close to multiple listed buildings in the Balsall Street area	0: Deemed neutral fit as this route does not pass through the immediate vicinity of any listed buildings	-1: Deemed small negative fit as this route passes close to a listed building on Station Road	-1: Deemed small negative fit as this route passes close to a listed building on Station Road
	Flood Zones	-1: Deemed small negative fit as this route passes close to a flood designation	-1: Deemed small negative fit as this route passes close to a flood designation	0: Deemed neutral fit as this route does not pass close to a flood designation	-1: Deemed small negative fit as this route passes close to a flood designation	0: Deemed neutral fit as this route does not pass close to a flood designation
	Utilities	-3: Deemed large negative fit as this route passes through 7 National Grid lines and a power line, the most of any of the options	-2: Deemed medium negative fit as this route passes through 5 National Grid lines and a power line	-1: Deemed small negative fit as this route passes through a power line	-1: Deemed small negative fit as this route passes through a power line	-1: Deemed small negative fit as this route passes through a power line
	Landscape Impact	-2: Deemed medium negative fit as this route passes very close to a village green and park between the western edge of Balsall Common and Balsall Street	-2: Deemed medium negative fit as this route passes very close to a village green and park between the western edge of Balsall Common and Balsall Street	-2: Deemed medium negative fit as this route passes through amenity open space and close to a play area, woodland and a park	-2: Deemed medium negative fit as this route passes through amenity open space, close to natural green space and very close to a local wildlife centre	-1: Deemed small negative fit as this route passes through amenity open space
	Green Belt	-3: Deemed large negative fit as the entire route is contained within designated green belt land	-3: Deemed large negative fit as the entire route is contained within designated green belt land	-1: Deemed small negative fit as most of the route is not within green belt land but the southern section between the A452 / B4101 junction and the A452 / A4177 junction is within designated green belt land	-3: Deemed large negative fit as the entire route is contained within designated green belt land	-3: Deemed large negative fit as the entire route is contained within designated green belt land

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