A46 Coventry Junctions (Walsgrave) Scheme Number: TR010066

7.3 Transport Assessment

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A46 Coventry Junctions (Walsgrave)

Development Consent Order 202[x]

TRANSPORT ASSESSMENT

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1. Introduction

1.1. Overview

1.1.1. This Transport Assessment (TA) relates to an application made by National Highways (the Applicant) to the Secretary of State for Transport via the Planning Inspectorate (the Inspectorate) under the Planning Act 2008 (the 2008 Act) for a Development Consent Order (DCO). If made, the DCO would grant consent for the A46 Coventry Junctions (Walsgrave) Scheme (the Scheme).

1.1.2. The purpose of this Transport Assessment, under section 37 of the Planning Act 2008, is to summarise the Scheme's impact on the strategic and local highway network with respect to traffic congestion and road safety for motorised transport. Thus, the scope of this report covers the transport modelling assessment of the Scheme's operation in the opening and design year forecast scenarios.

1.1.3. The traffic modelling assessment comprises of a strategic multi-modal model which covers Coventry as well as the wider Warwickshire area as shown later in Figure 4-1. The strategic modelling assessment is used as the basis to derive forecasted traffic impacts of the Scheme's performance across the wider area. The strategic model utilised for the Scheme has been developed in line with the Department for Transport's (DfT) Transport Analysis Guidance (TAG). A local traffic operational (micro-simulation) model of the existing Walsgrave Junction has also been developed to assess the Scheme's operational performance in the forecast year scenarios.

1.1.4. The framework of the modelling assessment has been developed to enable the comparative analysis of the operation of the existing Walsgrave Junction layout against the Scheme design. The comparative assessment is used to evaluate the performance of the Scheme against the Scheme objectives. Therefore, the modelling analysis summarised in this chapter details the Scheme's impacts with respect to congestion relief, journey time savings, reliability improvements and accident reductions.

1.2. Scheme background

1.2.1. The A46 corridor forms part of the national Strategic Road Network (SRN) connecting the M1, M6 and the M69 with the M5 and provides links to the SRN and the rest of the country. The South Midlands Route Strategy Evidence Report (Highways Agency, 2014) indicated that sections of the A46 to the south and east of Coventry suffer from congestion and poor journey time reliability. These are likely to be exacerbated by future housing growth and economic aspirations.

Many communities are located adjacent to the A46 and stakeholders have raised concerns regarding the pedestrian crossing points on and near the A46. The Coventry Junctions (Walsgrave) Scheme is part of the Applicant's commitment to improve the A46 'Trans-Midlands Trade Corridor' between the M5 and the Humber Ports. The A46 has historically experienced safety issues.

1.2.2. As part of the A46 Coventry Junctions Scheme improvements at the A45/A46 Tollbar End Junction, to the south of Coventry, to grade separate the A46 (N) to A45 (W) movements were completed in 2017 and work to upgrade the Binley Junction started in March 2020, and was completed in February 2023. Conversion of a section of the M6 between junctions 2 and 4 into a smart motorway was completed in March 2020.

1.2.3. Walsgrave Junction is the last remaining roundabout east of Coventry and north of Tollbar End Junction that is at-grade, and as such it is a pinch point for traffic. The Tollbar End Junction and M6 Smart Motorway improvements have increased the pressure on Binley and Walsgrave junctions.

1.2.4. The Road Investment Strategy 2 (RIS2) published in 2020 sets a long-term strategic vision for the network (Department for Transport, 2020). With that vision in mind, it then specifies the performance standards National Highways must meet; lists planned enhancement schemes expected to be built; and states the funding that would be made available during the second Road Period (RP2), covering the financial years 2020/21 to 2024/25. The A46 Coventry Junctions Scheme (i.e. both Binley and Walsgrave) is listed as a committed scheme for RP2. Further detail on the need for the Scheme is set out within the Case for the Scheme (**TR010066/APP/7.1**). The Funding Statement (**TR010066/APP/4.2**) presents details of the designated funds for delivery of the Scheme.

1.3. Scheme objectives

Department for Transport objectives

1.3.1. The Department for Transport's (DfT) RIS2 (DfT, 2020) sets out the following performance outcomes, which the Scheme aims to contribute towards:

- Improving safety for all
- Providing fast and reliable journeys
- A well maintained and resilient network
- Being environmentally responsible
- Meeting the needs of all users
- Achieving efficient delivery

National Highways' Scheme objectives

1.3.2. The objectives of the Scheme are to provide the following:

- An SRN that supports and facilitates economic growth, supporting employment and residential development opportunities.
- An SRN that is maintained to safe and serviceable condition.
- Improve the operation and efficiency of the existing transport network, delivering capacity enhancements to the SRN.
- An SRN that minimises its negative impacts on users, local communities and the environment.
- An SRN that balances the need of individuals and businesses that use and rely upon it.
- Reducing / minimising the impact on the wider environment, whilst seeking to bring enhancement.
- Operational maintenance to be considered holistically.

1.3.3. Section c of the RIS2 (DfT, 2020) has an ambition to develop a greener network, specifically envisaging the following:

- *'The majority of all vehicles using the SRN, including almost all cars and vans, are zero emission at the tailpipe, transforming the impact of the SRN on air quality and carbon emissions.*
- *The SRN makes extensive and effective use of environmentally and visually sensitive 'green infrastructure', modern materials and careful planting, including trees. Together, these minimise and mitigate the air, light, noise, visual, and water quality impacts of the SRN on those living or working near to it, and sustain habitats and enhance biodiversity.*
- *Enhancements to the network create roads that fit with their surroundings and which keep negative consequences to a minimum. In particular they have employed high standards of design, responding to place-specific issues and in keeping with the natural, built and historic environment.'*

1.3.4. The A46 corridor provides opportunities for economic growth and improved accessibility within Coventry and Warwickshire enabling the unlocking of sites for residential development and improving access to existing commercial areas.

1.3.5. Further details of how the Scheme meets the Department for Transport's performance outcomes and National Highways' Scheme objectives are set out within the Case for the Scheme (**TR010066/APP/7.1**).

1.4. Scheme location

1.4.1. The Scheme is located in the West Midlands, approximately 5km to the east of Coventry city centre. The Scheme involves improvements to the B4082 which runs eastwards from Clifford Bridge Road to the existing Walsgrave Junction and the A46 which runs north-south to the east of Coventry.

1.4.2. Figure 1-1 shows the location of the Binley and Walsgrave junctions and their strategic context.

1.5. Preferred route development

1.5.1. Four options were considered during the options selection stage, with three options discounted due the results of initial environmental assessment and traffic modelling deeming them non-viable. Option 11 was consulted on in 2022.

- Option 11 - a grade separated junction approximately 800m to the north of the existing roundabout location. The A46 mainline is realigned through the existing junction, with geometry to allow a 50mph speed limit on the mainline dual carriageway.

1.5.2. From the options assessed and consulted upon as described in the Case for the Scheme (**TR010066/APP/7.1**) and the Environmental Statement (ES) Chapter 3 (Assessment of Alternatives) (**TR010066/APP/6.1**), a preferred route was selected which meets with the principles and objectives set out above.

1.5.3. The Preferred Route, 'Option 11' was announced on the Scheme website in June 2022.

1.6. Scheme description

1.6.1. The main elements of the Scheme comprise:

- Realignment of the existing A46 dual carriageway through the existing at grade roundabout (which will be removed), for approximately 880m to improve the road geometry and allow for a 50mph speed limit.
- Earthworks on the eastern side of the A46 mainline to facilitate the realignment through the existing at grade roundabout.
- A new grade separated junction over the A46 mainline, approximately 800m north of the existing Walsgrave junction to connect the B4082 with the A46.
- A new overbridge structure across the existing A46, between the dumbbell roundabouts forming the grade separated junction.
- New merge and diverge slip roads at the grade separated junction for both northbound and southbound movements.

- Realignment of the B4082 to form a single carriageway link road, for approximately 900m, to connect the local road network to the new A46 grade separated junction with a proposed 40mph speed limit.
- Road assets and street furniture such as traffic signs and lines, variable message sign (VMS), street lighting columns, vehicle restraint systems, fences, retaining walls and kerbs.
- Drainage systems including a dry detention basin and two ponds that will be designed to be permanently wet.
- Proposed new maintenance accesses to the drainage features and VMS.
- Retention of the Hungerley Hall Farm accommodation bridge (the existing bridge that provides farm vehicle access over the A46 mainline).
- Farm access track to the north of Hungerley Hall Farm to provide gated access to the B4082 link road.
- Improvements to facilities for walkers, cyclists and horse-riders (WCH) through provision of a signalised pedestrian crossing on the B4082; and providing enabling works, including the retention of Hungerley Hall Farm accommodation overbridge, for a potential future WCH route to be provided by others.
- Replacement and installation of new highway boundary fencing.
- Replacement vegetation planting to compensate for the vegetation that needs to be removed to facilitate the Scheme.

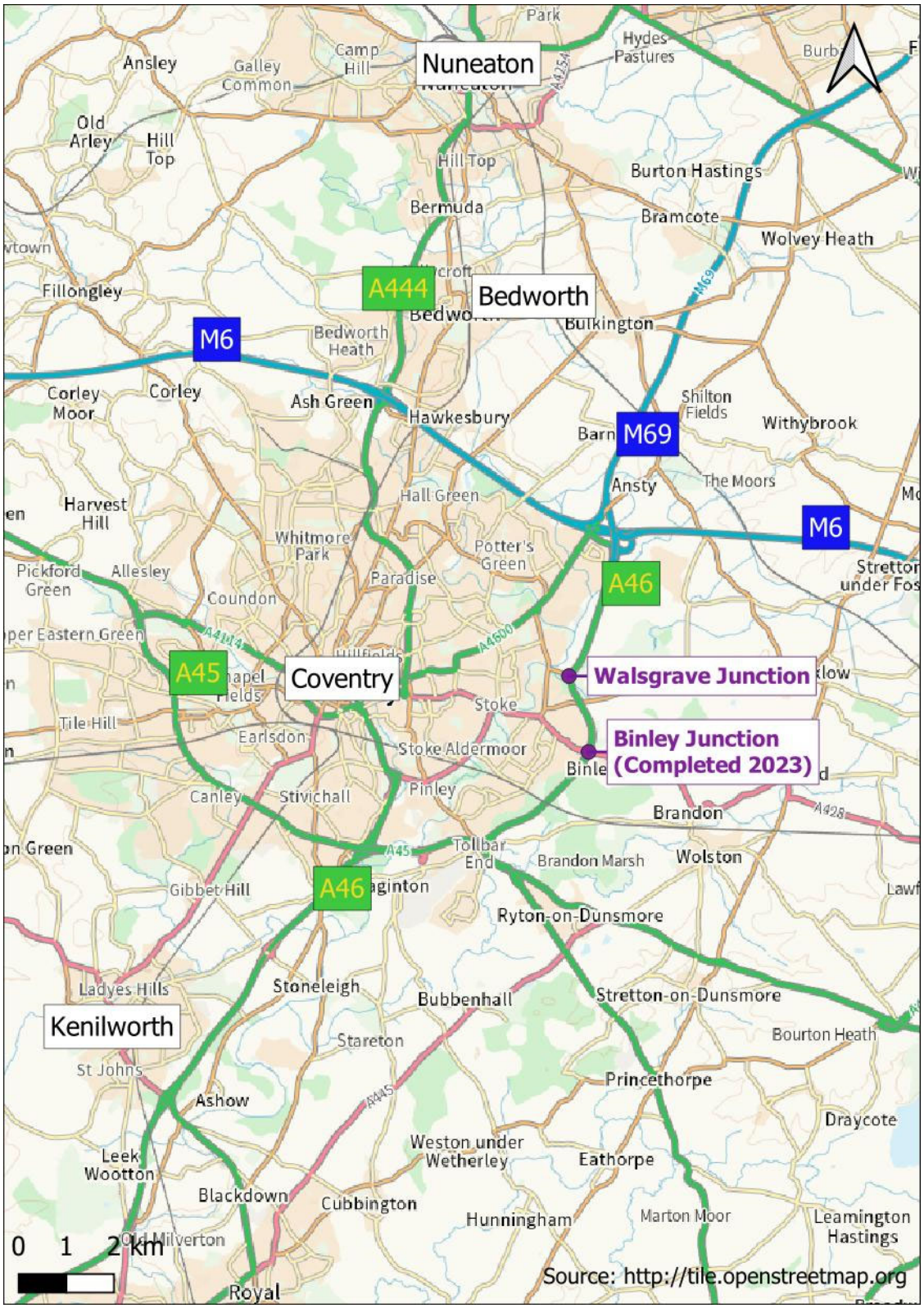
1.6.2. A detailed description of the Scheme can be found in ES Chapter 2 (The Scheme) (**TR010066/APP/6.1**) and further design information in the Scheme Design Report (**TR010066/APP/7.4**).

1.7. Document structure

1.7.1. This document comprises the sections as described below:

- Chapter 1 - Introduction
- Chapter 2 - Transport Policy and Guidance
- Chapter 3 - Baseline Data and Model Development
- Chapter 4 – Assessment methodology
- Chapter 5 - Current Network Performance
- Chapter 6 - Future Year Network Performance
- Chapter 7 - Road Safety
- Chapter 8 - Walking, Riding and Horse-riders Assessment
- Chapter 9 - Summary and Conclusions

Figure 1-1 Walsgrave Scheme location



2. Transport Policy and Guidance

2.1. Overview

2.1.1. This section outlines the national, regional and local policies that are relevant to the Scheme. In addition, other relevant strategies and guidance are also considered.

2.2. National policy, legislation, and guidance

National Networks National Policy Statement (2024)

2.2.1. The National Networks National Policy Statement (NPS NN) (designated on 24 May 2024) sets out the need, and Government's policies for delivering Nationally Significant Infrastructure Projects (NSIP) developments on the national road network. The compliance of the Scheme with the environmental requirements of the NPS NN is considered in detail in the NPS NN Accordance Tables (**TR010066/APP/7.2**). This section sets out how the Scheme is consistent with the aims of the NPS NN at a strategic level.

2.2.2. Paragraph 2.1 of the NPS NN recognises that "National networks provide critical long-distance links between places, offering fast and reliable journey times and in doing so enable connectivity between people and communities, which in turn supports and stimulates economic growth". Paragraph 2.1 of the NPS NN confirms that the improved connectivity can increase the economic density of an area, leading to increased productivity.

2.2.3. Roads are a critical part of the national transport framework in facilitating connectivity (NPS NN paragraph 2.5). The strategic and long-distance nature of the SRN provides long distance traffic with a safe and efficient route, freeing up local roads for genuinely local journeys and active travel, and keeping traffic away from principal centres of population (NPS NN paragraph 2.8).

2.2.4. Paragraph 3.2. the NPS NN confirms "Population growth and economic growth are the most critical influences on travel demand. Without investment and infrastructure interventions, increasing demand will lead to decreasing network performance for users, for example, poorer journey time reliability, which comes with economic and social costs." The Government has therefore concluded that at a strategic level there is a compelling need for development of all SRNs (NPS NN paragraph 3.22). The same paragraph confirms that "The Examining Authority and the Secretary of State should therefore start their assessment of applications for infrastructure covered by this NPS on that basis". Transport infrastructure is described as a "catalyst and key driver of growth", and it is important that the planning and development of infrastructure fully considers the role it can play in delivering sustainable growth (NPS NN paragraph 3.8).

2.2.5. The Government's policy of improving the existing national road network is set out in paragraph 3.46 of the NPS NN as including but not limited to:

- new and improved junctions and slip roads
- improvements to trunk roads, in particular, dualling of single carriageway strategic trunk roads and additional lanes on existing dual carriageways
- measures to enhance capacity of the motorway network

2.2.6. The NPS NN sets out that, subject to the detailed policies and protections contained in the NPS and the legal constraints set out in the PA 2008, there is a 'presumption in favour' of granting development consent for national network NSIPs that fall within the need for infrastructure established in the NPS NN (NPS NN paragraph 4.1).

2.2.7. Paragraph 1.4 of the NPS NN states: "Under section 104 of the Planning Act 2008 the Secretary of State must decide an application for a relevant NSIP in accordance with this NPS NN unless he/she is satisfied that to do so would:

- *lead to the UK being in breach of its international obligations;*
- *be unlawful;*
- *lead to the Secretary of State being in breach of any duty imposed by or under any legislation;*
- *result in adverse impacts of the development outweighing its benefits; and*
- *be contrary to legislation about how the decisions are to be taken."*

National Planning Policy Framework (2023)

2.2.8. The National Planning Policy Framework (NPPF) was initially published in March 2012 and most recently updated in December 2023. This document sets out the Government's planning policies for England, providing a framework within which local people and councils can encourage development which reflects the needs and priorities of their communities.

2.2.9. A key principle of the NPPF is the presumption in favour of sustainable development, which contributes to the economic, social, and environmental aspects of a community, as set out in paragraph seven of the NPPF.

2.2.10. The Scheme aims to build an inclusive Scheme which improves facilities for cyclists, walkers and other vulnerable users where existing routes are affected supporting the key principle of sustainable development in paragraph seven

Road Investment Strategy 2

2.2.11. The Road Investment Strategy 2 (RIS2) outlines investment in the SRN over the period 2020 to 2025 to deliver a combination of ongoing, approved and planned schemes as well as making long-term funding commitments for asset renewal and maintenance. The strategic vision from the RIS2 is that the SRN should be transformed over the next 25 years to create a modern network that supports modern Britain.

2.2.12. The RIS2 states the vision for a SRN that is fulfilling its purpose in 2050 envisages:

- A network that supports the economy
- A greener network
- A safer and more reliable network
- A more integrated network
- A smarter network.

2.2.13. The RIS2 scheme assessments seek to consider the balance of potential benefits and adverse impacts. Benefits to be considered include the facilitation of economic development, job creation, housing and environmental improvement, and any longer-term or wider benefits. Assessment of adverse impacts should include longer-term and cumulative adverse impacts, as well as planned mitigation of such. Environmental, safety, economic and social impacts should be considered at a national, regional and local level. The information to be provided should be proportionate to the scale of the scheme. All RIS projects should be subject to an options appraisal which considers viable modal alternatives and may also consider other options.

2.2.14. The RIS2 makes three major commitments to schemes for delivery through coming road periods that can underpin a wider economic transformation. One of which is improving the A46 ‘Trans-Midlands Trade Corridor’ between the M5 and the Humber Ports. Work in RP2 will create a continuous dual carriageway from Lincoln to Warwick, delivering one of Midlands Connect’s key priorities.

2.2.15. The A46 corridor experiences congestion problems and suffers from low peak hour speeds, high vehicle delay and poor journey time reliability. It also carries a significant volume of freight traffic and has several collision clusters. Most of the junctions along the route are grade separated, except for the two junctions at Binley and Walsgrave, which form effective pinch points and a barrier to economic growth. The commitment in RIS2 for the second road period (RP2) includes the A46 Coventry Junctions – grade separation of the Binley and

Walsgrave roundabouts on the A46 near Coventry, upgrading the trunk sections of the A45/A46 between the M6 and M40 to a consistent standard.

The Strategic Road Network and the Delivery of Sustainable Development (DfT Circular 02/2013)

2.2.16. This Circular explains how the Highways Agency (now National Highways) will engage with the planning system, communities and the development industry to deliver sustainable development and, thus, economic growth, whilst safeguarding the primary function and purpose of the SRN.

2.2.17. The document states that Highways England (National Highways) will work with local authorities to influence Local Plan decisions that may affect the SRN.

DfT Decarbonising transport: a better, greener Britain, Transport decarbonisation Plan (2021)

2.2.18. The TDP outlines the course which the DfT surmise will secure carbon net zero within travel across the UK, as well as the various benefits associated with carbon net zero travel. The DfT's TDP summarises its commitment to decarbonise transport.

2.2.19. The TDP includes a commitment to invest £15 million in 2021/22 to help address the backlog in traffic signal maintenance to improve traffic flow and reduce emissions. It also includes a commitment to review the National Networks National Policy Statement.

Operation Metrics Manual (2021)

2.2.20. KPIs and other performance indicators are set out in the July 2021 Operation Metrics Manual produced in collaboration with DfT and Office of Rail and Road. These reflect the KPIs set out in the Strategic Business Plan and give clear targets against which to measure success.

Transport Assessment guidance (2014)

2.2.21. In 2014 the Government (Ministry of Housing, Communities and Local Government (MHCLG)) produced guidance and advice on when Transport Assessments (TAs) and Transport Statements are required, and what they should contain. The guidance sets out that TAs should be:

- proportionate to the size and scope of the proposed development to which they relate and build on existing information wherever possible
- established at the earliest practicable possible stage of a development proposal

- tailored to particular local circumstances (other locally determined factors and information beyond those which are set out in this guidance may need to be considered in these studies provided there is robust evidence for doing so locally)
- brought forward through collaborative ongoing working between the local planning authority/transport authority, transport operators, rail network operators, National Highways where there may be implications for the SRN and other relevant bodies, engaging communities and local businesses in transport assessments can also be beneficial
- the timeframes over which they are conducted or operate should be appropriate in relation to the nature of developments to which they relate (and planned changed to transport infrastructure and management in the area)

2.2.22. The guidance also identifies the importance of appropriately considered cumulative impacts arising from other committed developments.

2.2.23. This TA is proportionate to the size and scope and has been produced in preparation for a DCO application and through the use of the uncertainty log, this TA considers the cumulative impacts arising from other committed developments.

2.3. Regional policy and guidance

2.3.1. The Scheme is situated within the Coventry City Council and Rugby Borough Council administrative areas (ES Figure 2.1 (Scheme Location) (**TR010066/APP/6.2**)). The boundary between these two administrative areas is along the western side of the A46. Rugby Borough Council's administrative area also forms part of Warwickshire County Council's administrative area, which shares the same border with Coventry City Council.

Warwickshire Council Plan 2022 – 2027 (2022)

2.3.2. The Warwickshire Council Plan was adopted in April 2022 and sets out the three strategic priorities and seven areas of focus over the years between 2022 and 2027. A focus area includes delivery of major infrastructure and improved transport. The three strategic priorities are:

- For Warwickshire to have a thriving economy and places that have the right jobs, skills, education and infrastructure.
- To be a County where all people can live their best lives; where communities and individuals are supported to live safely, healthily, happily and independently.
- For the County to have a sustainable future, adapting to and mitigating climate change and meeting net zero commitments.

2.3.3. One of the seven areas of focus includes delivery of major infrastructure, digital connectivity and improved transport options. It is noted that Warwickshire County Council boasts excellent transport links and is the hub of the motorway network, however this presents its own climate challenges. Warwickshire County Council had the third highest CO2 emissions per capita of all English county local authorities in 2019.

2.3.4. It is affirmed that long-term infrastructure plans will enable Warwickshire to make the greatest positive difference to levelling up communities. The plans will be integrated with those long-term transitions such as achieving net zero. Warwickshire County Council has ambitions for a transport network that is be fit for purpose, well-connected, in a good condition, utilises green technology and is safe for users. The Scheme adheres to and is an enabler of these objectives.

2.3.5. The Scheme adheres to the Plan, providing a road that is fit for purpose, whilst minimising the effects on the environment.

Coventry and Warwickshire Local Enterprise Partnership Strategic Economic Plan (2014)

2.3.6. The Coventry and Warwickshire Local Enterprise Partnership (CWLEP) has prepared a Strategic Economic Plan (SEP) that sets out priorities for driving forward the sub-regional economy. The SEP has identified a core geographical area, within which the CWLEP will prioritise its investment and other support. This includes the A46 from M40 Junction 15 to M6 Junction 2.

Warwickshire Strategic Economic Plan 2024 – 2034 (2024)

2.3.7. Warwickshire Strategic Economic Plan 2024-2034 was approved on 11 April 2024. This Plan seeks to create a future of inclusive and sustainable growth across the County, one where all residents can benefit, and the environment is protected. One of the priorities of this Plan is to ensure infrastructure and connectivity enables growth.

2.3.8. The Scheme will reduce congestion on the A46 this in turn will reduce negative impacts on users, local communities and the environment whilst balancing the need of individuals and businesses that use and rely upon the A46, thus having positive impacts on the economy.

Warwickshire Local Transport Plan (2023)

2.3.9. Warwickshire's Local Transport Plan (LTP4) was adopted by Warwickshire County Council in July 2023.

2.3.10. Active travel is high on the agenda and LTP4 includes an Active Travel Strategy, where they encourage moving away from car dependency, which will also ease congestion on the road network.

2.3.11. Warwickshire has a relatively high level of vehicles registered per head of population. This steady and sustained increase in the number of vehicles places heavy pressure on road space. Traffic congestion increases travel time and reduces the appeal of buses as a convenient alternative to car use.

2.3.12. Warwickshire Local Transport Plan includes a Motor Vehicle Strategy. This emphasises that Warwickshire lies at the heart of England and that its central location and closeness to large manufacturing centres have given it a strategic importance in the country's transport network. It mentions that the county is crisscrossed by a Strategic Road Network of motorways and trunk roads, managed by National Highways. This includes important interchanges with the M69/A5 and the M40/A46, with some routes recognised for their wider importance, such as the A46 Trans-Midlands Trade Corridor and the A5 Midlands Logistics Corridor. The road network in Warwickshire is vital for the economy but also is vital to the environment and shapes the places people live and work. Journey times are mentioned to be a key driver of choice for some routes.

2.3.13. The Transport Plan mentions that "Prior to the impact of the Covid pandemic, vehicle usage in Warwickshire had risen by approximately 40% compared to 1993 levels." One of the priorities of the plan is to reduce the need to travel by car and to prioritise alternative forms of transport.

2.3.14. Warwickshire County Council says it will maintain an effective network of routes throughout the county, which will include options for travel by road, rail, air and waterway, and by all types of users. Where these are not directly controlled by Warwickshire County Council, they will use their *"influence to bring about the changes which work for Warwickshire."* Their aim will be to *"reduce congestion on our road network, removing barriers to productivity, supporting jobs and improving health and wellbeing by promoting safe active travel choices."*

2.3.15. Transport remains at the heart of a functioning economy and Warwickshire County Council want to continue to support Warwickshire's economy by improving accessibility to jobs, allowing the movement of freight, supporting the delivery of new infrastructure and services, and by making the County an outstanding location for business.

2.3.16. The Safer Travel Strategy seeks to ensure that everyone should be presented with travel choices which allow them to reach their destinations free from harm. As Highways Authority, Warwickshire County Council's main area of

responsibility focuses on road safety. Warwickshire County Council has a Road Safety Partnership – which includes the police, other emergency services, local communities, schools and external road safety groups. This partnership method allows them to deliver a road safety strategy in an effective and joined-up.

2.3.17. The A46 is also recognised as important route for freight: "Motorways such as the M40 and M6, along with the A46 Trans-Midlands Trade Corridor, are vital for providing links through the county to international gateways such as ports and airports throughout the UK." The A5 and M6 corridors have many large distribution parks located near them, taking advantage of good access to the Strategic and Major Road Networks. The Transport Plan States that Warwickshire is located within the logistics 'Golden Triangle', from which 90% of the UK population can be reached within four hours' drive.

2.3.18. One of the key themes of the Local Transport Plan is improving carbon reductions from transport and the move towards Net Zero. The Plan states *"To meet the target of carbon Net Zero by 2050, car usage will need to decrease, and we will have to provide alternatives to the way we travel."* Although environment is high on the agenda, the Plan seeks to ensure transport is easily accessible.

2.3.19. Traffic congestion increases travel time and reduces the appeal of buses as a convenient alternative to car use. Journey times are also mentioned to be a key driver of choice for some routes. The Scheme will reduce congestion on the A46 thus reducing journey times and therefore could encourage the appeal of public transport. Reduced congestion also supports the economy by improving accessibility to jobs, allowing the movement of freight, supporting the delivery of new infrastructure and services.

Midlands Connect Full Strategy (Midlands Connect Partnership) (2017)

2.3.20. The Midlands Connect Partnership spans local authorities, Local Enterprise Partnerships, business groups, the region's two main airports, National Highways, Network Rail and the Department for Transport. It also included HS2 Ltd. It sets out a transport strategy that is focused on economic outputs, setting out transformational rail, road and digital infrastructure that will power the Midlands Engine for Growth. The Strategy includes a range of proposals that would benefit the Coventry area.

2.3.21. The Midlands Connect initiative identified six intensive growth corridors and four major hubs of economic activity across the wider Midlands. Evidence from Midlands Connect shows that improved highway reliability and regular average speeds, and higher line speeds on inter-regional rail and highway links across the Midlands provide an economic benefit to the wider Midlands of up to £800m

per annum by 2036 with 143,000 additional jobs when a ten per cent reduction in general travel costs are achieved. The schemes and measures arising from Midlands Connect technical evidence being produced for eight workstreams in 2016 will form the basis of development of this national/regional tier of the West Midlands Metropolitan Area's transport system.

2.3.22. This will be important to realise improvements between the East and West Midlands in corridors such as the A46/M69 Corridor and the A5 Corridor.

2.3.23. Midlands Connect highlights the importance of freight movements serving the West Midlands and crossing central England. It will also be invaluable in helping identify schemes to assist freight movements and to assist advanced manufacturing and other growth sectors of the West Midlands economy.

2.3.24. The Midlands Connect Corridor Study (A46 Corridor Study Phase 2 -Task 1 Final Report (November 2020)) focuses on improving the A46 corridor. The study states that the corridor supports 5.5 million people and 2.9 million jobs, contributing significantly to the English economy. The study aims to boost the economy by £7.1 billion over 60 years through targeted investments at congestion hotspots, and outlines a sequenced investment approach, including the construction of the A46 Newark Bypass and improvements to the A46 Coventry junctions. By 2041, the corridor is expected to accommodate 600,000 new residents, 150,000 new jobs, and 250,000 new homes. Midlands Connect is also focused on decarbonising the corridor and contributing to the 'Net Zero' carbon target by 2050. This comprehensive approach aims to enhance connectivity, support economic growth, and address environmental challenges.

Movement for Growth: 2026 Delivery Plan for Transport (Transport for West Midlands) (2016)

2.3.25. The Movement for Growth strategic transport plan articulates the vision outlined in the Strategic Economic Plan and provides a high-level policy framework and overall long-term approach for improving the transport system serving the West Midlands. The plan (currently) contains details of nearly 200 schemes and initiatives representing some £8bn worth of infrastructure and technology investment in the transport system.

West Midlands Combined Authority's (WMCA) Local Transport Plan (LTP), (2023)

2.3.26. The West Midlands Combined Authority's (WMCA) Local Transport Plan (LTP) (Reimagining transport in the West Midlands, Local Transport Plan Core Strategy) sets out policies to promote safe, integrated, efficient and economic transport to, from and within the area as well as plans to implement those policies. It proposes a new vision for travel in the West Midlands where people

can thrive without having to drive or own a car. To get there the Core Strategy sets out the need for actions to help improve accessibility, reduce traffic, and electrify transport. This document is the Core Strategy for the fifth Local Transport Plan (LTP) for the West Midlands. It sets out the overall aims, vision and approach to guide the development and delivery of transport policies until the end of 2041.

2.3.27. WMCA are planning to develop four Area Strategies for the West Midlands covering the Black Country, Birmingham, Solihull and Coventry.

2.4. Local Policy Context

2.4.1. There are a number of local transport policy documents which are applicable to the Scheme. These are given below with a brief reference to the policies identified as directly relevant to the Scheme.

Coventry City Council Local Plan 2011-2031 (2017)

2.4.2. The Coventry Local Plan, adopted on 6 December 2017, serves as a statutory document guiding the city council's decisions on planning applications. It encompasses the council's strategies and policies, including those related to transport, ensuring development aligns with the city's vision and regulatory requirements. Supplementary Planning Documents (SPDs) support the Local Plan, detailing specific policies and guidelines.

2.4.3. The Plan embraces this growth and identifies land for new homes, new jobs and ne retail and community uses. It also plans proactively for the removal of land from the city's Green Belt in the first time in 50 years, to help facilitate growth and development as well as creating high quality urban and natural environments for those wishing to live and work in Coventry. This includes two significant urban extensions to the north and west of the city.

2.4.4. Coventry is well connected to the national road network having good access to the A46/M40, M69, M6, M45/M1 and M42. The Local plan states that "*Highways England* [National Highways] *manage the strategic road network which surrounds Coventry and is crucial to its national connectivity needs. This includes the A46 corridor which has been designated as an Expressway in the Highways England Road Investment Strategy".* The Local Plan comments on the A46 new junction, and states that *"The road network will continue to cater for a largest proportion of strategic freight, business and leisure trips including the M6, A45/M1 and A46/M40."* It says*: "Further improvements are planned at Brandon Road and Walsgrave near the B4082 to introduce grade separation to improve traffic flow"* and *"Future capacity enhancements on the strategic highway*

network which support Coventry's economic growth proposals will be supported."

2.4.5. The Plan notes that the Office for National Statistics recognises Coventry as the fastest growing city outside of Greater London, with job creation continuing to grow and the city's two universities thriving.

2.4.6. The Plan states that Coventry's population is projected to grow by in excess of 89,000 people between 2011 and 2031, with growth in the working age population of approximately 48,000 people.

2.4.7. To facilitate this growth, the plan recognises that new, high-quality infrastructure is required to combat congestion and transport issues.

2.4.8. The A46 Scheme will assist in improving the connectivity of Coventry in line with their overarching vision within the Local Plan which reflects the Council's wider corporate plan (The Council Plan) of *COVENTRY – A top ten City that is globally connected and locally committed.*

2.4.9. One of the Local Plan objectives is maintaining and enhancing an accessible transport network, supported by a series of sub-objectives, as follows:

- *"Providing a transport network that enhances the city's accessibility, efficiency, safety and sustainability;*
- *Continuing to improve links with the city centre and to provide better connection to green spaces within Coventry; and*
- *Increasing the range of opportunities for people to access arts and culture, sports and leisure, music and events and other activities. The Local Plan recognises that the local transport system will play a critically important role in supporting major housing and jobs growth in Coventry and the Council's ambition to become a 'top ten city'. The Plan therefore advocates more detailed and descriptive guidance to govern planning decisions and agreements."*

2.4.10. The Coventry Local Plan 2011-2031 sets out allocated areas for development of housing close to A46 in the Walsgrave area and identifies the potential for a blue light route to University Hospital Coventry from the Scheme.

2.4.11. The Scheme will enable future residential development opportunities by providing potential means of access to A46, such as those to the west of the A46 allocated in the Coventry Local Plan. An example includes Walsgrave Hill Farm Allocation (H2:3) which provides a projected 900 homes. The Walsgrave Hill Farm Housing Allocation H2:3 is to the west of the A46 and the north of the B4082, this includes the retention of listed buildings at Hungerley Hall Farm. The Local Plan states that the site will also incorporate blue light access linking the

A46 to the University Hospital Coventry and facilitate and work with National Highways on highways proposals linked to a new grade separated junction at Clifford Bridge. There will be provision of essential drainage and flood risk infrastructure.

Coventry Connected Supplementary Planning Document (SPD) (2018)

2.4.12. The Coventry Connected SPD provides further guidance to support Policies LPAC1 – LPAC4 of the Coventry Local Plan (2017) and sets out Coventry's long term spatial vision for how the city will grow, develop and change and how this vision will be delivered through a strategy for promoting, distributing and delivering sustainable development in relation to accessibility. Overall, the objective of this SPD is to ensure that forecasted growth in Coventry can be achieved through a series of developments that support and enhance the city's transport network.

2.4.13. Its content has been taken into account in the Scheme design, as detailed in the Scheme Design Report (**TR010066/APP/7.4**) and ES Chapter 12 (Population and Human Health) (**TR010066/APP/6.1**). In addition, in line with this SPD, an Outline Traffic Management Plan (OTMP) (**TR010066/APP/7.5**) is submitted with the application for this Scheme.

2.4.14. Coventry City Council's Local Plan is supported by a number of other SPDs in addition to this Coventry Connected document. The Health Impact Assessment (HIA) SPD is of particular importance to this SPD and the Scheme, health impacts of the Scheme are considered in ES Chapter 12 (Population and Human Health) (**TR010066/APP/6.1**).

Coventry Infrastructure Delivery Plan (2017)

2.4.15. The Coventry Infrastructure Delivery Plan (IDP) is a key component of the city's Local Plan, which outlines development goals up to 2031. The IDP details the necessary infrastructure to support this growth, including:

- Housing and Jobs: Identifying where new homes and employment opportunities will be created.
- Services and Facilities: Ensuring the provision of essential services like healthcare, education, and community facilities.
- Transport: Improving transport networks to facilitate better movement of people and goods.
- Environmental Sustainability: Incorporating green spaces and sustainable practices to enhance the living environment.

2.4.16. The plan also specifies the timing, costs, and funding sources for these infrastructure projects. The IDP specifically mentions the significant A46

upgrades to the A46 corridor, particularly focusing on improving junctions at Binley and Walsgrave.

Coventry Transport Strategy (2023)

2.4.17. The Strategy sets out Coventry City Council's plans to deliver a transport system that meets the need of the city's population, businesses and wider community, providing access to community facilities and supporting a thriving economy and a healthy population.

2.4.18. The Coventry Transport Strategy sets out the following objectives:

- Supporting the city's economic recovery and enabling long-term growth
- Delivering a sustainable, low carbon transport system
- Ensuring equality of opportunity
- Maximising health and wellbeing and reducing health inequalities

2.4.19. The strategy recognises the need to reduce inequalities in access to economic, educational and cultural opportunities and in public health, and to improve the quality of life for local people.

2.4.20. It sets out plans to bring about a fundamental change to the way that people and goods travel to, from and around the city in the future, and identifies how Coventry City Council will work with various partners to achieve this. It includes:

- The case for change: A summary of how the transport system is working currently and why it needs to change a long-term vision, including a set of objectives which the Council aim to meet over the next 15 years.
- A broad description of what Coventry City Council will do over the lifetime of the strategy (2022/23 – 2036/37) to achieve these objectives. Further detail is set out in an accompanying Implementation Plan.
- A summary of how Coventry City Council will measure progress, through annual reporting.

2.4.21. The Strategy is fully integrated with the West Midlands Combined Authority's (WMCA) Local Transport Plan (LTP), and the two documents together provide the transport policy framework for Coventry.

2.4.22. The Strategy is subject to regular review, to allow for response to changes in national or regional policies, the emergence of new technology such as autonomous vehicles, or to respond to changes in travel behaviour, such as those brought about during the COVID-19 pandemic.

2.4.23. An Annual Progress Report will also be prepared to outline progress in implementing the strategy, and to report any changes to the Implementation Plan.

2.4.24. Specific road improvements to be delivered over the lifetime of the Transport Strategy include various improvements to the A46 including the Walsgrave Junction improvements by National Highways.

2.4.25. The Implementation Plan accompanies Coventry City Council's Transport Strategy. This document provides further detail about the plans and sets out details of the specific improvements that Coventry City Council will make to the city's transport network and the expected timescales and approximate costs associated with these. This list National Highways as the lead organisation delivering the Scheme, with an estimated cost of £50-100 million, with progress in Years 1 and 2, 2022/2023 and being the Scheme in development and years 3-4 the scheme in construction/Scheme delivery.

2.4.26. Specific road improvements to be delivered over the lifetime of the Transport Strategy include various improvements to the A46 including the Walsgrave junction improvements by National Highways. The Scheme fulfils the improvements required to the A46 and will assist in delivery of wider goals relating to the economy, society and environment.

Coventry City Council Economic Development Strategy 2022-2027 (2022)

2.4.27. Coventry City Council Economic Development Strategy was published in August 2022. In the 10 years after the 2008/09 recession, Coventry & Warwickshire was the fastest-growing local economy in England, with economic output (measured in real Gross Value Added (GVA)) growing by 33.4% between 2008/09 and 2016/17. This was driven significantly by major investments in research and development and production in the automotive sector and its supply chain, as well as continued expansion of the professional services sector and creative economy. Coventry had the fastest growing population of UK cities from 2009-2019 and its economic progress was exemplified by the award of UK City of Culture for 2021, being a host venue for the 2022 Commonwealth Games, and being part of the West Midlands 5G Test Bed – the first in the UK.

2.4.28. However, the local economy has encountered significant challenges in recent years, particularly around the COVID-19 Pandemic. Further challenges emerged in 2021 and 2022, with inflation, labour shortages, and new regulations and document requirements for UK-EU trade post-Brexit all of which have slowed economic recovery.

2.4.29. It is therefore crucial that Coventry is able to deliver a strong and sustainable economic recovery from this challenging economic climate, and that foundations are put in place for longer-term economic prosperity.

2.4.30. The Economic Development Strategy mentions that there are opportunities presented by the city's outstanding digital and transport connectivity.

Rugby Local Plan (June 2019)

2.4.31. Rugby Borough Council Local Plan (2019) sets out the Council's policies and proposals to support the development of the Borough through to 2031. The Local Plan was informed by a detailed understanding of Rugby Borough, including the makeup of its population, the local environment and economy. The Local Plan states that between 2001- 2011 the borough's population increased significantly by 14.8% to around 100,496. The rise in population was largely due to people migrating into the area and more single parent families, but also as a result of increased birth rate and people living longer. The projected population increase between 2011 and 2031 is expected to be 15.5%, which would bring the population to around 115,236.

2.4.32. The Local Plan states that the growth that Rugby Borough needs to accommodate over the period of the Local Plan needs to be delivered in a sustainable way.

2.4.33. The strategy promotes modal shift towards public transport and low and zero emission vehicles. The Local Plan recognises that improved transport infrastructure is required to support growth to 2031.

2.5. Policy summary

2.5.1. The need for the Scheme is demonstrated by its inclusion within the RIS and within national, regional and local transport and planning policy. Section 3(6) of the Infrastructure Act 2015 places a duty on the Secretary of State to comply with the provisions of the RIS.

2.5.2. The NPS NN highlights the importance of the national road network and that responding to economic and traffic growth are the key drivers for its development.

2.5.3. The Scheme is also consistent with the core planning principles laid out in the NPPF and is consistent with national planning policy through local planning documentation.

2.5.4. In this aspect the Scheme is wholly aligned with national policy. The Scheme is intended to alleviate congestion and accommodate future traffic growth, and contribute to increased economic growth, both regionally and nationally

2.5.5. Regional and local planning policy recognises the A46 as a crucial piece of local infrastructure and highlights that the A46 currently suffers from congestion which is placing a constraint on local growth.

2.5.6. By increasing road capacity, reducing congestion at the existing Walsgrave Junction, and improving green infrastructure, the Scheme will encourage inward investment, support housebuilding and support the economic growth and in the Coventry and Warwickshire area.

2.5.7. The Scheme also accords with the policies of the Coventry City Council Local Plan and the Rugby Borough Council Local Plan in contributing to key regional infrastructure needed to support economic and housing growth.

2.6. National Highways policy and guidance

Highways England: Licence (2015)

2.6.1. The Highways England: Licence (2015) sets out key requirements which must be complied with by the Licence holder as well as statutory guidance. In exercising its functions and complying with its legal duties and obligations, the Licence holder must act in such a manner which it considers best calculated to:

a) Ensure the effective operation of the network
b) Ensure the maintenance, resilience, renewal, and replacement of the network
c) Ensure the improvement, enhancement and long-term development of the network
d) Ensure efficiency and value for money
e) Protect and improve the safety of the network
f) Co-operate with other persons or organisations for the purposes of coordinating day-to-day operations and long-term planning
g) Minimise the environmental impacts of operating, maintaining and improving its network and seek to protect and enhance the quality of the surrounding environment
h) Conform to the principles of sustainable development

National Highways Strategic Business Plan 2016

2.6.2. The National Highways Strategic Business Plan (2016) provides the high-level direction for every part of National Highways for the RP2, underpinned by the three imperatives: safety, customer service and delivery. It is structured around

six performance outcomes from the performance framework, as agreed with the Department for Transport (DfT). The six Key Performance Indicators (KPIs) are:

- Improving safety for all
- Providing fast and reliable journeys
- A well-maintained and resilient network
- Delivering better environmental outcomes
- Meeting the needs of all users
- Achieving efficient delivery

2.6.3. The Scheme is assessed with reference to each of these KPIs to understand the Scheme's fit against the National Highways objectives.

National Highways Delivery Plan (2020-2025)

2.6.4. The National Highways Delivery Plan (2020-2025) supports the Strategic Business Plan, covering the core activities in operations, maintenance and renewals, as well as delivery across enhancement schemes. It sets out the commitment to continue work on the A46 Binley and Walsgrave roundabouts and upgrade the A45/A46 trunk road sections between the M6 and M40. The objective for these schemes is that together, these will increase capacity, improve the consistency of the roads and relieve congestion to support the growing local economy.

Net Zero Highways (2021)

2.6.5. The Net Zero Highways initiative by National Highways aims to make road travel in the UK carbon-neutral by 2050. Targets of this initiative include:

- Corporate Emissions: Achieve net zero for their own operations by 2030. This includes reducing emissions from network lighting, roadside equipment, travel, and offices.
- Maintenance and Construction Emissions: Reach net zero for maintenance and construction activities by 2040. This involves decarbonising the production and use of materials like asphalt, cement, and steel.
- Road User Emissions: Ensure net zero carbon travel on roads by 2050. This includes supporting the transition to electric vehicles and other low-emission technologies.

2.6.6. The plan is aligned with the UK's broader climate goals and involves significant investment in sustainable infrastructure and technologies.

National Highways Safety Framework

2.6.7. The National Highways Safety Framework contains policies relating to the safety in design, construction and end use. These have been considered in the Scheme design development.

2.6.8. Health, Safety and Wellbeing policy: The long-term ambition is that no one should be harmed when travelling or working on the strategic road network

- Throughout the Scheme design the project has been reviewed for the stages of design, construction and use to be as safe as reasonably possible.
- In line with these assessments, mitigation measures have been outlined to inform of and manage the risks at each stage (for example traffic management during construction and installation of barriers for end users to protect from collision with roadside infrastructure).
- The Scheme stakeholders have been engaged throughout this process to aid in understanding and knowledge that the road has been developed with safety in mind.

2.6.9. Requirements for safety risk assessment (GG104) - GG 104 sets out the framework for managing safety risks for customers, workers or other parties.

- Throughout the Scheme design development, the design has been assessed in line with DMRB GG104;
- The safety assessment aids designers to review the design for customers, workers and other parties to influence how the design can be made safer;
- These assessments and actions taken improve the safety of the Scheme development stages (construction and end use).

3. Baseline data and model development

3.1. Introduction

3.1.1. This chapter of the transport assessment provides a summary of the baseline data collection used for the assessment of the Scheme and the development of the highway assignment and microsimulation models. This includes the collection of volumetric traffic count data, network data and vehicle journey time data. This data is used in the model development process to calibrate and validate the baseline in order to provide a stable basis to undertake the future year assessment of the Scheme.

3.1.2. In addition to the traffic data collection, reported accident data information has been sourced to inform the road safety assessment. Public transport, walking and cycle information has also been sourced to inform the assessment of the walking, cycling and horse-riding impacts.

3.2. Baseline data collection

3.2.1. Ideally, an updated base model would utilise the most recent available traffic data to establish a model that reflects current conditions.

3.2.2. However, due to the impact of COVID-19 travel restrictions and the traffic management in place for the construction of the A46 Binley junction between 2019 and early 2023, traffic conditions within this time period were not considered likely to reflect normal operating conditions.

3.2.3. Further, a combined economic assessment of both the A46 Binley and Walsgrave Junctions against a background of a no A46 Coventry Junction Scheme upgrades is required.

3.2.4. As such, a base model is needed dating prior to the construction of Binley and hence use of any surveys post Autumn 2019 would not be appropriate due to the combined impact of COVID-19 travel restrictions and the road works associated with the construction of the Binley junction upgrade.

3.2.5. Traffic counts obtained from National Highways' TRIS database indicated that the traffic flow pattern on A46 at the existing Walsgrave Junction remains generally consistent across the three year period of 2017-2019.

3.2.6. Therefore, it is considered that all survey data collected for the options selection stage was still relevant and suitable for continued use in the preliminary design transport modelling and no new surveys were required.

3.2.7. The following sections detail the data collected at options selection stage and any further suitable data available for use at preliminary design.

3.3. Traffic flows

3.3.1. Existing count data was reviewed at options selection stage during 2019-2020. Data was available from three local authorities, namely: Transport for West Midlands, Warwickshire County Council and Leicestershire County Council. Around 250 sites in total between the three sources were used at options selection stage which included some data from 2016 and 2017 as well as 2018.

3.3.2. Additional surveys were carried out for the options identification stage of the Walsgrave Junction Scheme with two sets of traffic surveys commissioned in May and October 2018 in the Binley-Walsgrave area.

3.3.3. A local traffic model was produced for Ansty Park, a technology park located to the east of Coventry. Traffic surveys were undertaken for this model and some sites were also selected and processed as part of the data collection for the Walsgrave options selection stage. Further, to assess the accuracy of turning movements, in the modelled area and potentially to improve matrix estimation, classified turning counts from the Ansty Park data set have been compiled for use in modelling.

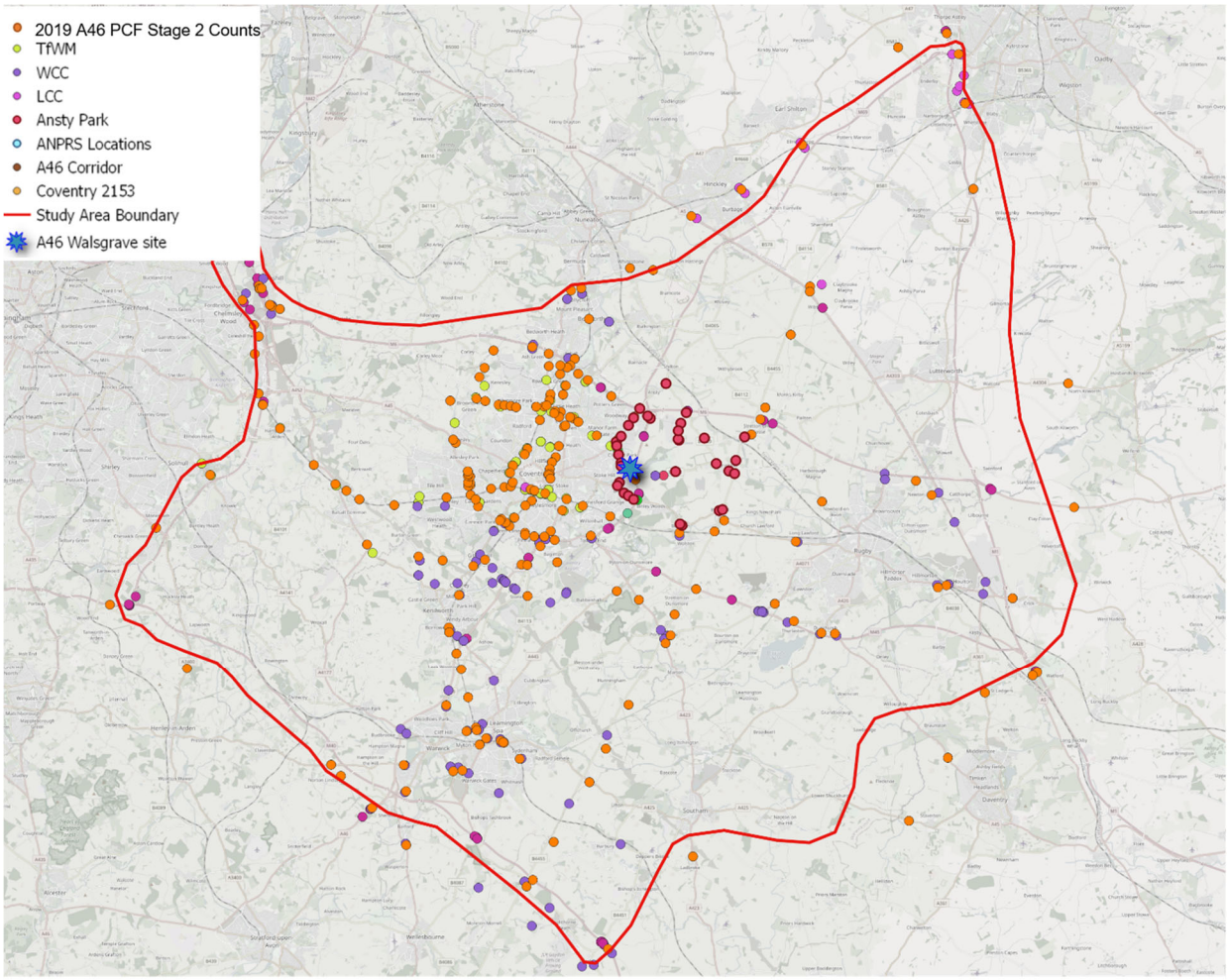
3.3.4. Following gap analysis, surveys were commissioned in Spring 2019 to collect the required additional data to fill the count site gaps for the model calibration process. This totalled 306 surveys although this includes link counts and turning counts at the same location as separate sites.

3.3.5. The survey information collated and analysed included:

- Link counts from the National Highways' TRIS data;
- Link and turning count data from local transport and highway authorities, such as Transport for West Midlands, Warwickshire County Council and Leicestershire County Council;
- Link and turning count survey data undertaken for the A46 Walsgrave Scheme in 2018;
- 2019 surveyed manual classified link and turning counts; and automatic traffic counts; and
- Other survey data collected for traffic modelling in the area (Ansty Technology Park including link, turn and Automatic Number Plate Recognition data).

3.3.6. Count locations are shown in Figure 3-1.

Figure 3-1 Study Area Count Locations



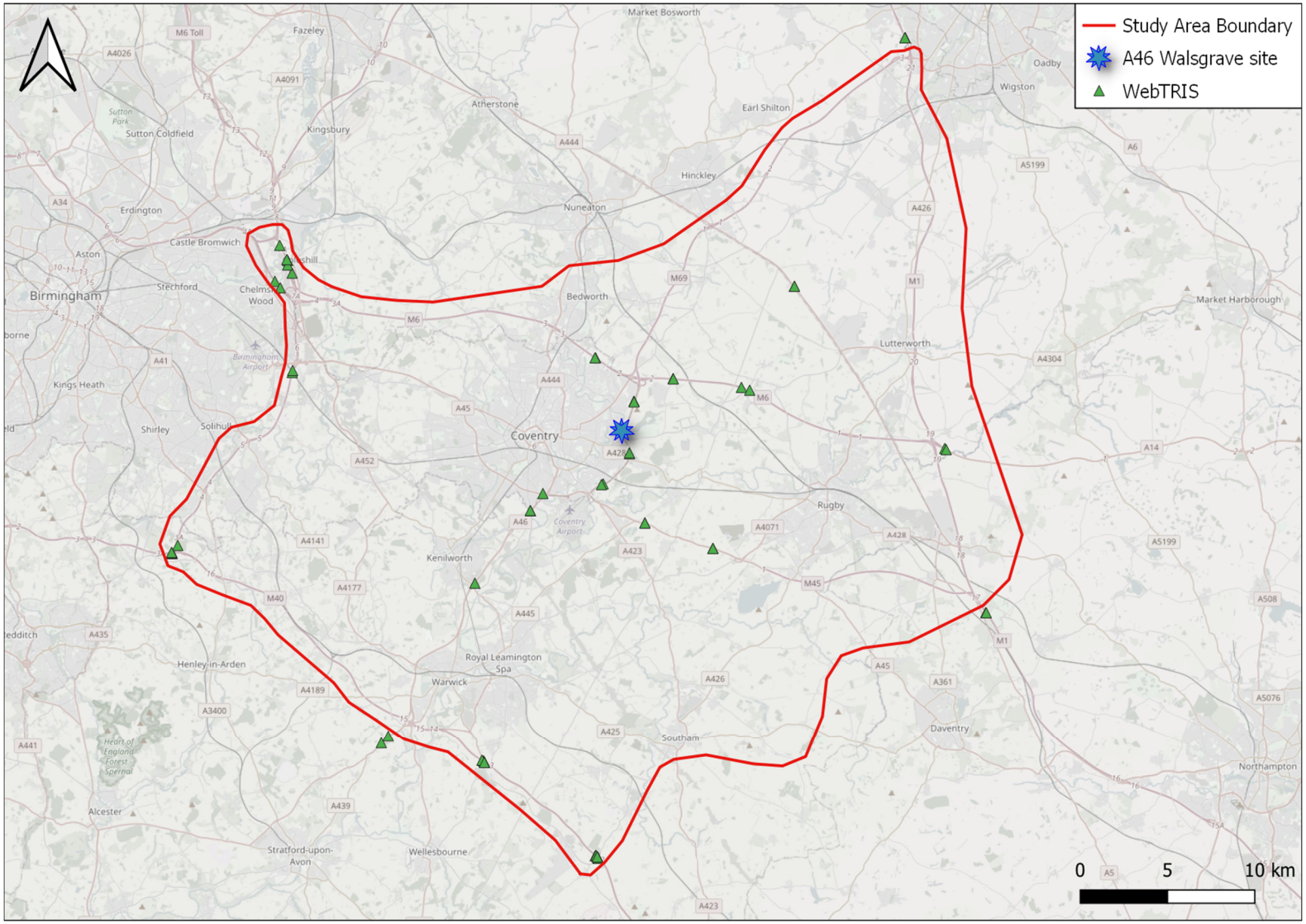
3.4. National Highways' TRIS data

3.4.1. Continuous automatic traffic counts were obtained from National Highways' TRIS database. Over 50 relevant sites were identified within the Area of Detailed Modelling, as shown on Figure 3-2.

3.4.2. As the Base Year of autumn 2018 was retained for preliminary design, the data recorded and downloaded in those months was still valid.

3.4.3. Previously, where no data was available from the TRIS database for the period September-November 2018, data was collected for May-June 2018, Autumn 2017 or Autumn 2016, in order of preference. These sites were reviewed and, where 2019 data would be more valid, data for these sites was updated.

Figure 3-2 TRIS Sites in Area of Detailed Modelling



3.5. Road network and traffic movement data

3.5.1. National Highways have developed a series of regional traffic models under a consistent framework to support the delivery of the schemes identified in the RIS. The entire SRN and major associated links in England are represented in five strategic models representing the north, the trans-Pennine south or Northern Powerhouse area, the midlands (MRTM), the south-west and the south-east.

3.5.2. Provisional trip matrices were constructed using mobile phone data. The MRTM model network and mobile phone prior matrix traffic movement data were therefore adopted in the study to inform the development of the Scheme assessment 2018 base year model.

3.5.3. In addition to MRTM data, Google Earth Pro and TrafficMaster data were used as data sources for traffic highway network development. Traffic signal data was sourced from Coventry County Council.

3.6. Journey time data

3.6.1. TrafficMaster (TM) data was obtained from the DfT for Coventry and the surrounding area for the calendar year 2018. Within this dataset, Autumn 2018 data was selected (September to November).

3.6.2. The TM data contains GPS data at regular intervals from vehicles aggregated in 15-minute intervals. This information is gathered from fleet management services provided by TM from different businesses and the data was provided at monthly intervals.

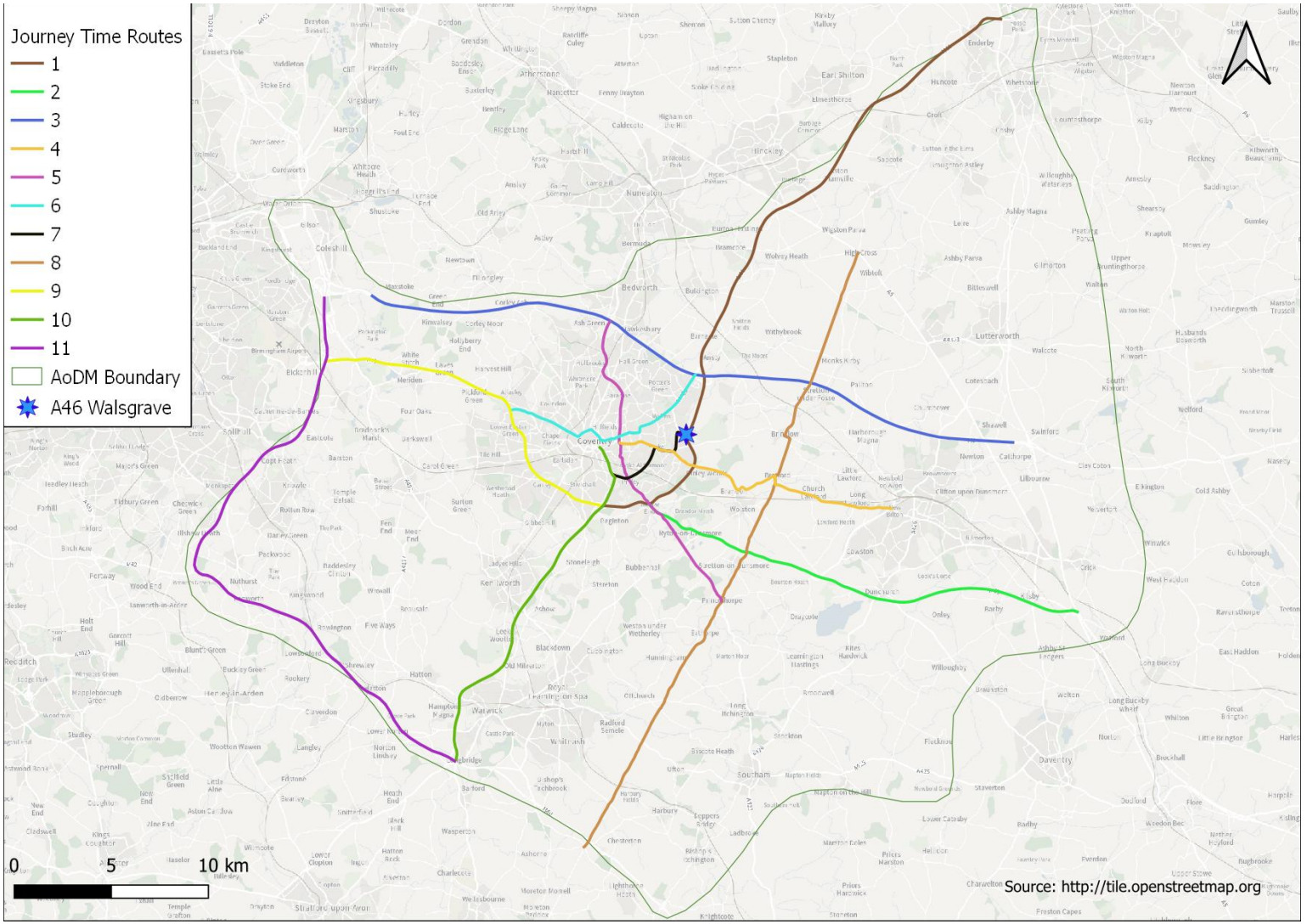
3.6.3. The data was filtered according to vehicle type, date, and time of day. Additionally, the data was checked for outliers and these were excluded from the summary calculations. This was done by excluding values outside two standard deviations from the mean journey time and this excludes the vast majority of outliers within the data in a systematic manner.

3.6.4. The data contains nine different types of vehicles. For the calculation of journey times, cars and LGVs were used, as these are by far the most numerous in the dataset and are more homogeneous in terms of behaviour.

3.6.5. Weekends, bank holidays and school holidays were removed from the dataset as being unrepresentative of typical days of travel.

3.6.6. Journey time data was extracted for the three model time periods (AM, Interpeak and PM). The eleven journey time routes defined for validating against the Base Year Coventry Strategic Traffic Model (CoSTM), are shown in Figure 3-3.

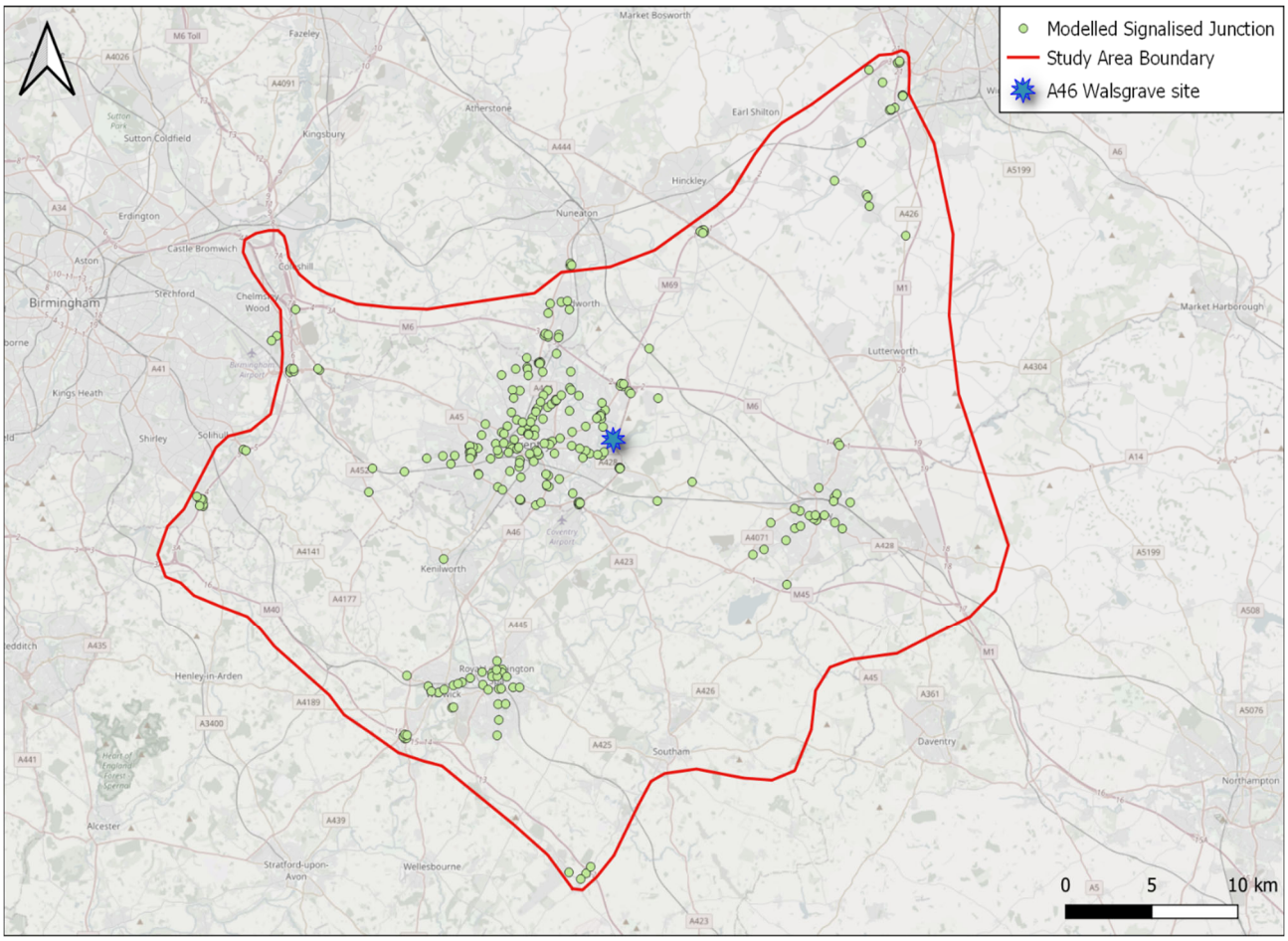
Figure 3-3 Journey time routes



3.7. Traffic signal data

3.7.1. Traffic signal data from local highway authorities, the MRTM and CASM models was collected as part of options selection stage modelling. As the base year of 2018 has been retained, this traffic signal data was still relevant and no further observed data has been obtained with review of the RTM2 models was made to update any signal timings where observed/data from CASM was not available. Locations of the modelled signalised junctions are shown in Figure 3-4 below:

Figure 3-4 Modelled signalised junctions



3.8. Accidents

3.8.1. Department for Transport Stats19 accident data records are information provided by local authorities to central government for national purposes. They are used to inform and monitor road safety policy at local, national, and international levels. Stats19 data have been analysed, over the 2015-2019 period, to identify all reported accidents which have occurred across the Scheme impact area.

3.8.2. The data set includes details of all recorded slight, serious and fatal accidents across the time period. Where no observed data was available, default accident rates have been used.

3.8.3. This information has been adopted to provide observed accident rates as an input to the COBA-LT (Cost-Benefit of Accidents - Light Touch) modelling assessment.

3.9. Public transport facilities

3.9.1. The public transport services that are located within the study area are summarised in Table 3-1. Data was collected on 10 March 2023 by taking on site photographs of the information displayed at the bus stops within the study area. Bus timing and frequency information was then checked on the Transport for West Midlands website.

3.9.2. There are no other transport interchanges, bus stations or railway stations within the vicinity of the Scheme.

Table 3-1 Public transport services summary

Bus stop	Location	Bus Service	Frequency	Route
Clifford Bridge Road (S/B) Wyken Green, Tesco (after)	50m south of Tesco roundabout	60	Hourly	Arena Park Retail - Uni of Warwick via Willenhall
		85/85B	Hourly	Coventry - Rugby via Brinklow
		85A	Two hourly (Sunday only)	Coventry - Rugby via Brinklow
		86	1 AM service and 1 PM service	Coventry - Rugby via Wolston
		86	1 AM service and 1 PM service	Rugby - Coventry via Wolston
		218	1 service only	Binley Woods - Walsgrave Tesco
		X30	2 per hour	Ansty Park Circular via City Centre
Clifford Bridge Road (N/B) Wyken Green, Tesco (opp)	40m north of Tesco roundabout	60	Hourly	University of Warwick - Arena Park Retail via Willenhall
		85/85B	Hourly	Rugby - Coventry via Brinklow
		85A	Two hourly (Sunday only)	Rugby - Coventry via Brinklow
		86	1 AM service and 1 PM service	Coventry - Rugby via Wolston
		86	1 AM service and 1 PM service	Rugby - Coventry via Wolston
		X30	2 per hour	Ansty Park Circular via City Centre
Clifford Bridge Road (S/B) Stoke, Gainford Rise (adj)	210m south of B4082 roundabout	85/85B	Hourly	Coventry - Rugby via Brinklow
		85A	Two hourly (Sunday only)	Coventry - Rugby via Brinklow
		86	1 AM service and 1 PM service	Coventry - Rugby via Wolston
		86	1 AM service and 1 PM service	Rugby - Coventry via Wolston
		218	1 service only (Friday)	Binley Woods - Walsgrave Tesco
Clifford Bridge Road (N/B) Stoke, Gainford Rise (opp)	110m south of B4082 roundabout	85/85B	Hourly	Rugby - Coventry via Brinklow
		85A	Two hourly (Sunday only)	Rugby - Coventry via Brinklow
		86	1 AM service and 1 PM service	Coventry - Rugby via Wolston
		86	1 AM service and 1 PM service	Rugby - Coventry via Wolston
		218	1 service only (Friday)	Binley Woods - Walsgrave Tesco

3.10. Existing pedestrian, cycling and horse-riding facilities

3.10.1. There are a number of walking, cycling and horse-riding (WCH) facilities located within the ES study area of 500m from the Order Limits, which comprise Public Rights of Way (PRoW), (namely footpaths and a bridleway), permissive footpaths, cycle tracks and footways provided as part of the highway network (see ES Chapter 12 (Population and Human Health) (**TR010066/APP/6.1**)). The location of existing WCH facilities is shown Figure 3-5 and the details of the existing facilities in Table 3-2.

3.10.2. Within the Order Limits the WCH facilities are limited to the following:

- Bridleway 235 (Coventry) and Bridleway 156/R75x/1 (Warwickshire) which uses the Farber Road overbridge to the north of the Scheme
- Footways at the Clifford Bridge Road/B4082 roundabout
- Uncontrolled crossing on the B4082 arm of the Clifford Bridge Road/B4082 roundabout

Figure 3-5 WCH facilities and survey locations (from ES Figure 12.2 (**TR010066/APP/6.2**)

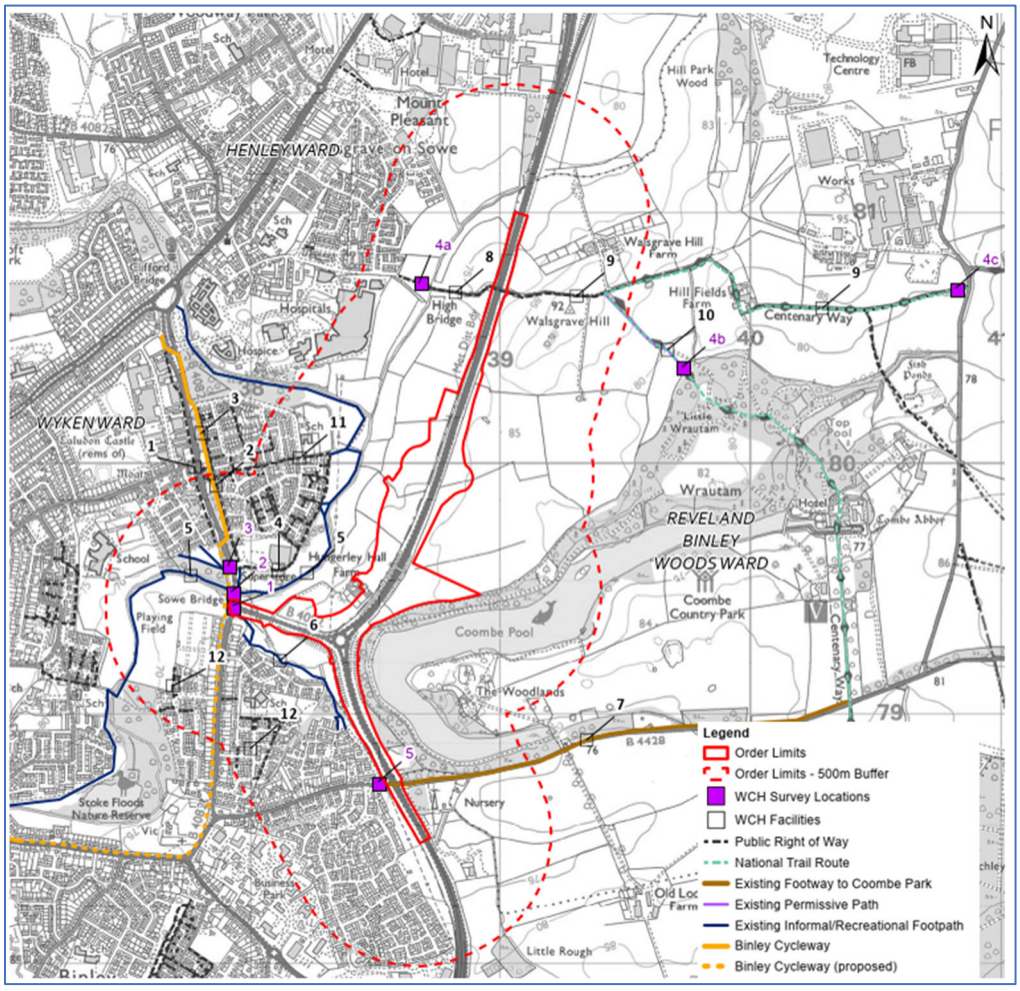


Table 3-2 WCH facilities in the study area

Location ref ES Figure 12.2 (TR010066/APP/6.2)	PRoW reference / Permissive route reference / Facility location	Description
1	Clifford Bridge Road, Coventry	A continuous footway with uncontrolled crossings at junctions is provided on the western frontage of Clifford Bridge Road. The footway is typically 2m wide although a section adjacent to the B4082 link road roundabout is locally widened. The footway adjacent to the Tesco roundabout is segregated from the carriageway by a wide verge before re-joining the carriageway edge further to the north. Between the two roundabouts, a link is provided to the leisure footpath that follows the River Sowe.
2	Clifford Bridge Road, Coventry	A continuous footway with uncontrolled crossings at junctions is provided on the eastern frontage of Clifford Bridge Road. The footway is typically 2m wide although a section between the B4082 link road roundabout and the Tesco roundabout is locally widened. To the north of the Tesco roundabout the footway is set back around 30m from the carriageway by a wooded area and continues as a footpath as far as Dorchester Way before returning to run alongside the carriageway as footway.
3	Clifford Bridge Road, Coventry	A segregated cycle track (part of the Binley Cycleway) is provided on the eastern frontage of Clifford Bridge Road between its junction with Ansty Road and a point approximately 90m to the north of its junction with the Tesco roundabout.
4	Tesco roundabout, Clifford Bridge Road, Coventry	A footpath running along the southern side of the supermarket providing links to the adjacent residential area as well as connections to the leisure footpath that runs alongside the River Sowe.
5	Clifford Bridge Road, Coventry	The River Sowe footpath is a leisure route that runs alongside the river. It passes under Clifford Bridge Road providing grade separated pedestrian access to the footway on the western frontage of the carriageway.
6	Clifford Bridge Road/B4082 link road roundabout, Coventry	Two informal paths have been created by local residents in the vicinity of the B4082 link roundabout. These paths pass through the wooded area to the south-east of the roundabout providing a linkage to a footpath which serves the adjacent residential area. This latter footpath facilitates access between Clifford Bridge Road and Brinklow Road as well as the residential area and the footway network immediately adjacent to this route.
7	Brinklow Road, Coventry	A footway is provided along the northern frontage of Brinklow Road which links the residential areas around Clifford Bridge Road to Coombe Country Park. The footway is typically 1.5m wide from the point where it passes under the A46 up to the Country Park access some 1.9km to the east beyond which the footway ends.

Location ref ES Figure 12.2 (TR010066/APP/6.2)	PRoW reference / Permissive route reference / Facility location	Description
8	Bridleway 235, Coventry	Bridleway 235, a PRoW, runs from the city/county boundary (as a continuation of PRoW 156/R75x/1 in Warwickshire) in the east to Highbridge (namely the bridge crossing the River Sowe) in the west. The route follows a farm access track and is fronted by farmland. Although not recorded on the Definitive Map, Coventry City Council has confirmed that the section of the route between Highbridge and Farber Road is also a bridleway.
9	Bridleway 156/R75x/1, Warwickshire	Bridleway 156/R75x/1 runs as a continuation of PRoW 235 in Coventry from the county boundary in the west to the junction of PRoW 156/R75b/1 and PRoW 156/R75y/1 in the east, albeit these latter footpaths lie outside of the study area. The route continues along the farm access track and is fronted by farmland.
10	Centenary Way (permissive route), Warwickshire	The Centenary Way Long Distance walking trail is a 159km footpath originating in the Tame Valley and ending in the Ilmington Downs. The route passes close to several major local settlements, including Coventry, Warwick, and Leamington. The route passes through Coombe Country Park connecting with Bridleway 156 R75x/1 via a section of permissive route and continues east along the bridleway towards the southern section of Ansty Business Park.
11	Dorchester Way residential area, Coventry	Numerous PRoW are defined under The City of Coventry (Footpath 61A to 214) Modification Order 2003 which cover a series of footpaths that serve the properties in the Dorchester Way residential area.
12	Clifford Bridge Road, Coventry	The City of Coventry (Footpath 61A to 214) Modification Order 2003 covers a series of footpaths that serve the residential properties located to the east and west of Clifford Bridge Road, south of the B4082 link road roundabout.

3.10.3. The final section of Binley Cycleway, which comprises the section of the route on Clifford Bridge Road between the Tesco roundabout and the A4082/A428 junction to the south and west, was due to commence construction in June 2024. In close proximity to the Scheme, the new cycleway, which is being provided by Coventry City Council, would comprise a fully segregated two-way cycle track running on the western side of Clifford Bridge Road and there would be complementary improvements at the Clifford Bridge Road/B4082 roundabout to maintain a two-lane entry on the northbound approach to the roundabout. The proposals would also include provision of a new signal controlled (Puffin) pedestrian crossing on Clifford Bridge Road to the south of the roundabout. However, it is understood that implementation of the final section of the cycleway is delayed due to a petition objecting to the proposals and local elections.

Coventry City Council remains committed to completing the cycleway but cannot give a definitive position on the timeframe for implementation at the time of writing.

3.11. Pedestrian, cycling and Horse-riding movements

3.11.1. The Walking, Cycling, Horse-riding Assessment and Review (WCHAR) process has been undertaken as part of the Scheme. The outcome of the assessment is presented in ES Chapter 12 (Population and Human Health) (**TR010066/APP/6.1**).

3.11.2. To provide an indication on the level of usage of WCH facilities in the vicinity of the proposed Scheme, WCH surveys were undertaken at the following locations, as shown on Figure 3-5:

- Site 1: Clifford Bridge Road / B4082 roundabout;
- Site 2: Clifford Bridge Road links to river side path network
- Site 3: Clifford Bridge Road / Tesco roundabout
- Site 4: PRoW Bridleway / permissive path junction (Centenary Way) to Coombe Country Park)
- Site 5: Brinklow Road / Valencia Road junction

3.11.3. The surveys were carried out between 7am and 7pm for seven consecutive days between Wednesday 14 June and Tuesday 20 June 2023 inclusive, using CCTV video cameras. A summary of the results is provided in ES Chapter 12 (Population and Human Health) (**TR010066/APP/6.1**).

3.12. The transport network

3.12.1. The existing Walsgrave Junction is an at grade junction comprising of a roundabout junction. The junction has three approach arms, all of which are priority controlled. The A46 is part of the strategic trunk road network managed by National Highways. The B4082 to the west is managed by Coventry City Council.

3.12.2. The main carriageway of the A46 at this location is a dual two-lane with 7.3m wide carriageways with 1m wide hard strips and a central reserve varying from 4.5m minimum wide to 12m maximum wide in sections. The A46 is subject to national speed limit of 70mph. The B4082 is a 7.3m single carriageway with 1m wide hard strips and is subject to a 60mph national speed limit for single carriageway roads.

3.12.3. In summary, listed from the north in a clockwise direction, the junction arms are as follows:

- The A46 northbound exit
- The A46 southbound approach
- The A46 southbound exit
- The A46 northbound approach
- The B4082 westbound exit
- The B4082 eastbound approach

3.13. Parking facilities

3.13.1. There are no parking facilities in the vicinity of the Scheme. The surrounding area is semi-rural and therefore has minimal public parking facilities.

3.13.2. The nearest facilities are residents parking on Clifford Bridge Road to the south of the junction with the B4082 and the customer car park for the Tesco Superstore adjoining Clifford Bridge Road to the north of the junction with the B4082. It is not anticipated that either of these will be affected by the Scheme.

4. Assessment methodology

4.1. Introduction

4.1.1. This chapter provides a summary of the Scheme modelling assessment. The baseline dataset includes the collection of volumetric traffic count, network and vehicle journey time data sources. This information is used in the model development process to calibrate and validate the baseline model. The fully calibrated and validated base year model then provides a stable basis to undertake the future year assessment of the Scheme.

4.1.2. The framework of the modelling assessment has been developed to enable the comparative analysis of the operation of the existing Walsgrave Junction layout against the Scheme. The comparative assessment is used to evaluate the Scheme's improvement performance against the Scheme objectives.

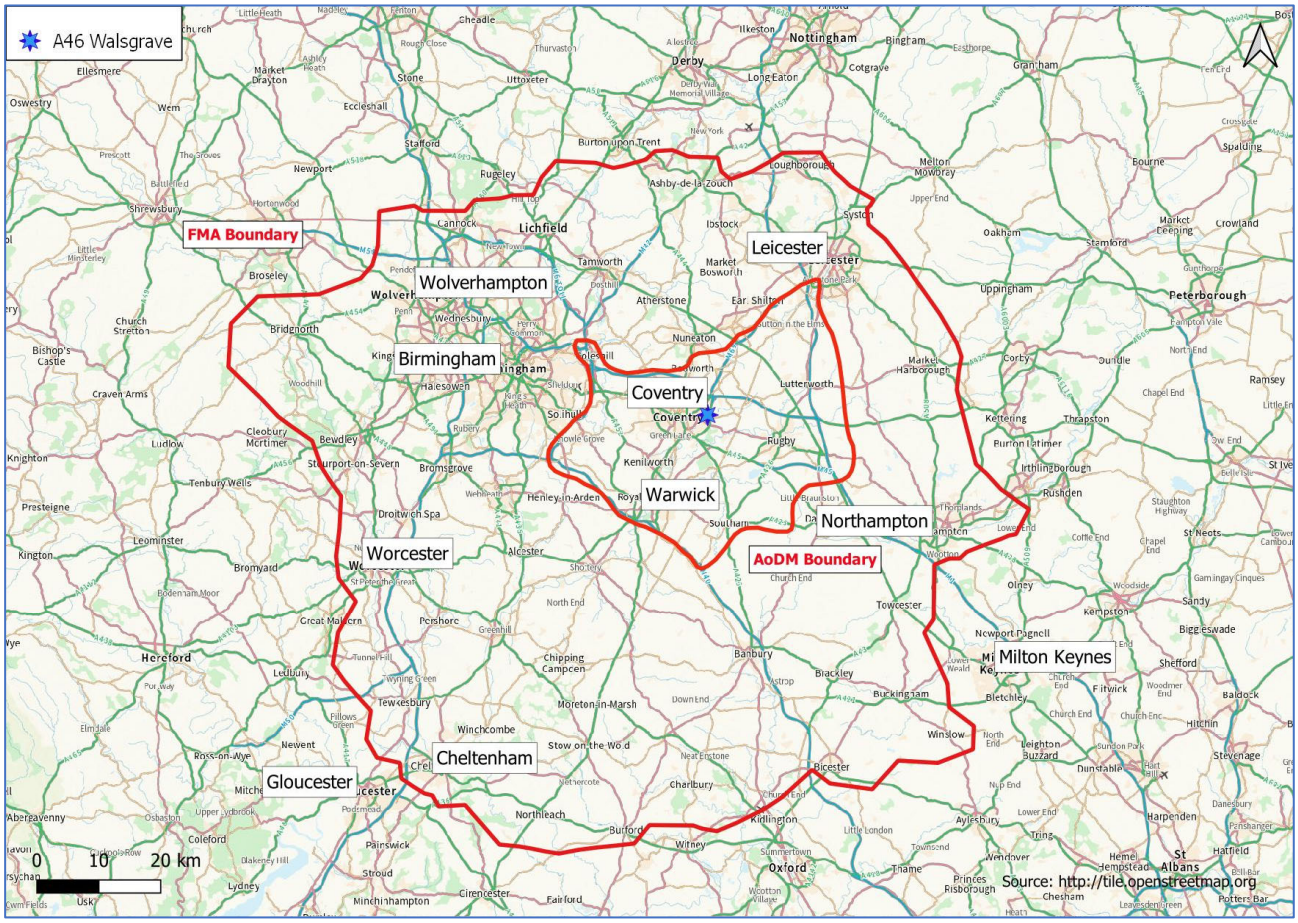
4.1.3. The modelling assessment comprises of the use of a strategic multi-modal model which is utilised to assess the Scheme. For the options selection stage a new 2019 base year transport model was developed from the Midlands Regional Transport Model (MRTM) in 2020.

4.1.4. As part of preliminary design, it was agreed to update the model to utilise the underlying demand from the Midlands Regional Transport Model 2 (MRTM2) in development of the Stage 3 Coventry Strategic Transport Model (CoSTM).

4.1.5. The model covers the whole UK with the level of detail increasing with proximity to the Scheme. The extents of the Area of Detailed Modelling (AoDM) are shown in Figure 4-1. The AoDM is the area within which significant changes in flow and speed due to the Scheme may be expected to occur. The AoDM has been specified as detailed, simulation, network.

4.1.6. The extent of the traffic model and level of coding detail needs to be such that it allows for the accurate representation of existing and forecast traffic flows. Outside of the AoDM, a Fully Modelled Area (FMA) was identified where links were represented as 'buffer' with no detail of junction operation. However, the level of detail included in the upgraded MRTM2 model would be lost were the buffer conversion and link reduction process carried out in the option selection stage repeated. As such, the simulation coding was extended to encompass all of the FMA.

Figure 4-1 Model extent



4.1.7. Based on the above, the two types of area were then defined as:

- Simulation area:
  - AoDM modelling characterised by representation of all trip movements, small zones and detailed network representation with junction modelling (including flow metering and blocking back).
  - Simulation area outside of the AoDM within the simulation boundary encompassing all of the FMA. Again, with detailed network representation with junction modelling (including flow metering and blocking back) but with somewhat larger zones and slightly less network detail.
- External area:
  - Conversion of MRTM2 simulation coding to buffer network using a combination of fixed speeds and speed flow curves depending on the level of detail included in MRTM2.
  - Retention of the MRTM2 existing buffer network at the extents of the model.

4.2. The base year model

4.2.1. The Coventry Strategic Transport Model (CoSTM) base year has been developed to represent a typical weekday in 2018, utilising the data collected as part of the Scheme assessment. The model has a 2018 base year in order to be unaffected by COVID travel restrictions and the construction of the A46 Binley Junction.

4.2.2. The base model was developed in accordance with the DfT's TAG Unit M3.1: Highway Assignment Modelling.

4.2.3. The CoSTM modelling system comprises 2 components:

- A highway assignment model – used for estimating travel costs and identifying the routes travellers may choose through the road network using SATURN[1]
- A Variable Demand model (VDM) - used for estimating how travellers will respond to changes in their travel costs between highway and public transport using DIADEM (and the integrated interface (HEIDI))

4.2.4. Key features of the CoSTM model include:

- CoSTM was developed to model the AM, inter- and PM peak hours. The modelled time periods are:
  - AM Peak – 07:00 to 09:00
  - PM Peak – 16:00 to 18:00
  - Interpeak – 09:00 to 16:00
- The highway trip purposes represented in the model comprise of 5 user groups:
  - car employer business
  - car commute
  - car other
  - light goods vehicles (LGVs)
  - heavy goods vehicles (HGVs)

4.2.5. As part of preliminary design, it has been agreed to update the model to utilise the underlying demand from the Midlands Regional Transport Model 2 (MRTM2) in development of the Stage 3 CoSTM.

4.2.6. Traffic count data is used to calibrate the model based on a matrix estimation (ME) procedure. The SATURN ME process adjusts the prior trip matrix based on the strategic traffic assignment and the observed count data. This process utilises the data referred to in Section 3.2. A variety of checks were undertaken

[1] Simulation and Assignment of Traffic in Urban Road Network (SATURN): https://saturnsoftware2.co.uk/

to ascertain that ME has not altered the integrity and profile of the trip matrix. These included:

- Matrix calibration:
    - Matrix zonal cell values, prior to and post matrix estimation, with regression statistics (slopes, intercepts and R2 values);
    - Zonal trip ends, prior to and post matrix estimation, with regression statistics (slopes, intercepts and R2 values);
    - Trip length distributions, prior to and post matrix estimation, with means and standard deviations.
    - Sector to sector level matrix changes within 5%
- Cordon and screenline link flow calibration
    - differences between modelled flow and counts should be less than 5% of the counts in all or nearly all cases;
- Turning count calibration
    - greater than 85% of counts within the required numerical statistic

4.2.7. The results of the calibration indicated that the TAG criteria were achieved for matrix, turn and link flow calibration.

4.2.8. Subsequent to the ME process, the model was validated against independent data sets based on the following criteria:

- Flows across screenlines
- Individual link flows
- Journey time comparison
- Model convergence

4.2.9. The criterion for overall screen line validation was met with each of the 4 validation screenlines within 5% difference in numbers of vehicles in each peak period. However, initial analysis of individual validation links did not meet the required TAG criteria. Analysis of the links indicated that a significant proportion of the validation links are relatively far from the Scheme where the network is modelled in less detail and size of zones are increasingly large. As such, although the GEH statistics did not fully meet the TAG criteria, the modelled flows are considered acceptable as those considered near to the Scheme meet the TAG requirement of at least 85% of links achieving either the flow or GEH target and the overall validation screenlines meet the 5% difference in numbers of vehicles criterion.

4.2.10. TAG criteria were achieved for the journey time validation assessment.

4.2.11. Model convergence was fully achieved in all three peak hour models.

4.2.12. The model utilises the calibrated MRTM2 VDM adjusted for the local network/zone structure. Realism testing was undertaken to determine that no material changes to the VDM results were noted. This included the car vehicle kilometres realism test with respect to fuel cost (matrix-based and network-based versions). Satisfactory convergence results (gap values) were achieved during realism testing with the calculated overall fuel cost elasticity well within the WebTAG indicated range. As such, it was considered that the VDM calibration was not materially affected by the changes made to the model and was considered suitable for use.

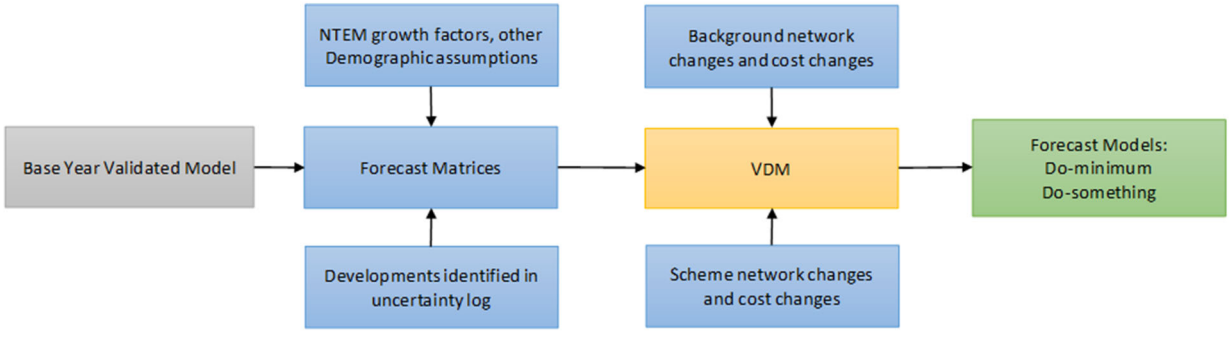
4.2.13. Based on the calibration and validation assessments, the model was considered to reflect observed traffic flows and travel times across the network to a high level and is suitable for use as a basis for future year forecasting and assessment of the Scheme.

4.3. The forecast modelling approach

4.3.1. The forecasting approach involves creating initial reference case travel demand forecasts which reflect changes in car ownership, population, employment and other demographic and economic factors. However, traffic growth resulting from other sources, such as changes in generalised costs due to traffic conditions, are not included in the reference case forecasts. These impacts are evaluated through the VDM.

4.3.2. The overall forecasting approach is summarised in the flowchart in Figure 4-2.

Figure 4-2 Forecasting approach



4.4. Forecast years

4.4.1. The base year and forecast years are listed as follows:

- 2018 Base Year
- 2028 A46 Walsgrave Opening Year
- 2043 Design Year (15 years after opening)

4.4.2. In the future year scenarios, 2028 and 2043, both a Do Minimum (DM) and a Do Something (DS) network scenario has been modelled. Hence the comparison of the Do Minimum and a Do Something provides the assessment of the Schemes impacts in a given forecast year.

4.5. Traffic growth forecasts

4.5.1. The traffic forecasts are dependent on household and employment growth, which were derived from both local and national growth forecasts. The local growth forecasts consider the local authority growth projections and the national growth forecasts take wider anticipated growth into account.

4.5.2. The wider area national growth in car trips is derived from the DfT National Trip End Model (NTEM 8.0). This provides demographic projections in employment and population throughout the UK. The change in freight traffic (light and heavy goods vehicles) was derived from the National Road Traffic Projections 2022 (NRTP22)

4.5.3. The local authority forecasts on development growth are derived from the uncertainty log. The uncertainty log details the local authority development schemes in regions which are both nearby and significant to the model. This includes assumptions on local uncertainty, which is dependent on whether developments or other planned transport schemes close to the Scheme area are proposed. In addition to identifying each source of uncertainty in the local area, the uncertainty log lists the following information for each source:

- The core assumptions – describing the assumptions that have been made for the Core scenario
- The likelihood that the scheme or development will go ahead
- The range of assumptions around each input or parameter and, if possible, information about the distribution

4.5.4. The Core scenario represents the most unbiased and realistic set of assumptions. It is intended to provide a sound basis for decision-making given current evidence. It must be robust and evidence-based taking on board various factors and noting uncertainties affecting travel demand in the future. In accordance with TAG guidance, the uncertainty log includes the management of the uncertainties required for formulating the Core scenario.

4.5.5. The definition of each classification of likelihood is summarised in Table 4-1. Where a scheme or land use change is considered *near certain* or *more than likely*, it was included in the Core scenario.

Table 4-1 Uncertainty log – classification of future inputs

Probability of the Input	Local Authority / Development Scheme	National Highways
Near Certain: The outcome will happen or there is a high probability that it will happen.	• Intent announced by the proponent to regulatory agencies • Approved development proposals • Schemes under construction	Planning stage completed (i.e. scheme consented), scheme entering or in detailed design
More than likely: The outcome is likely to happen but there is some uncertainty.	• Submission of planning or consent application imminent • Development application within the consent process • Schemes under construction	Option selection stage completed, scheme entering or in preliminary design
Reasonably Foreseeable: The outcome may happen, but there is significant uncertainty.	• Identified within a development plan • Not directly associated with the transport strategy/scheme, but may occur if the strategy/scheme is implemented • Development conditional upon the transport strategy/scheme proceeding • Or, a committed policy goal, subject to tests (e.g. of deliverability) whose outcomes are subject to significant uncertainty	Scheme in option identification or option selection stage
Hypothetical: There is considerable uncertainty whether the outcome will ever happen.	• Conjecture based upon currently available information • Discussed on a conceptual basis • One of a number of possible inputs in an initial consultation process • Or a policy aspiration	A scheme in strategy, shaping and prioritisation stage

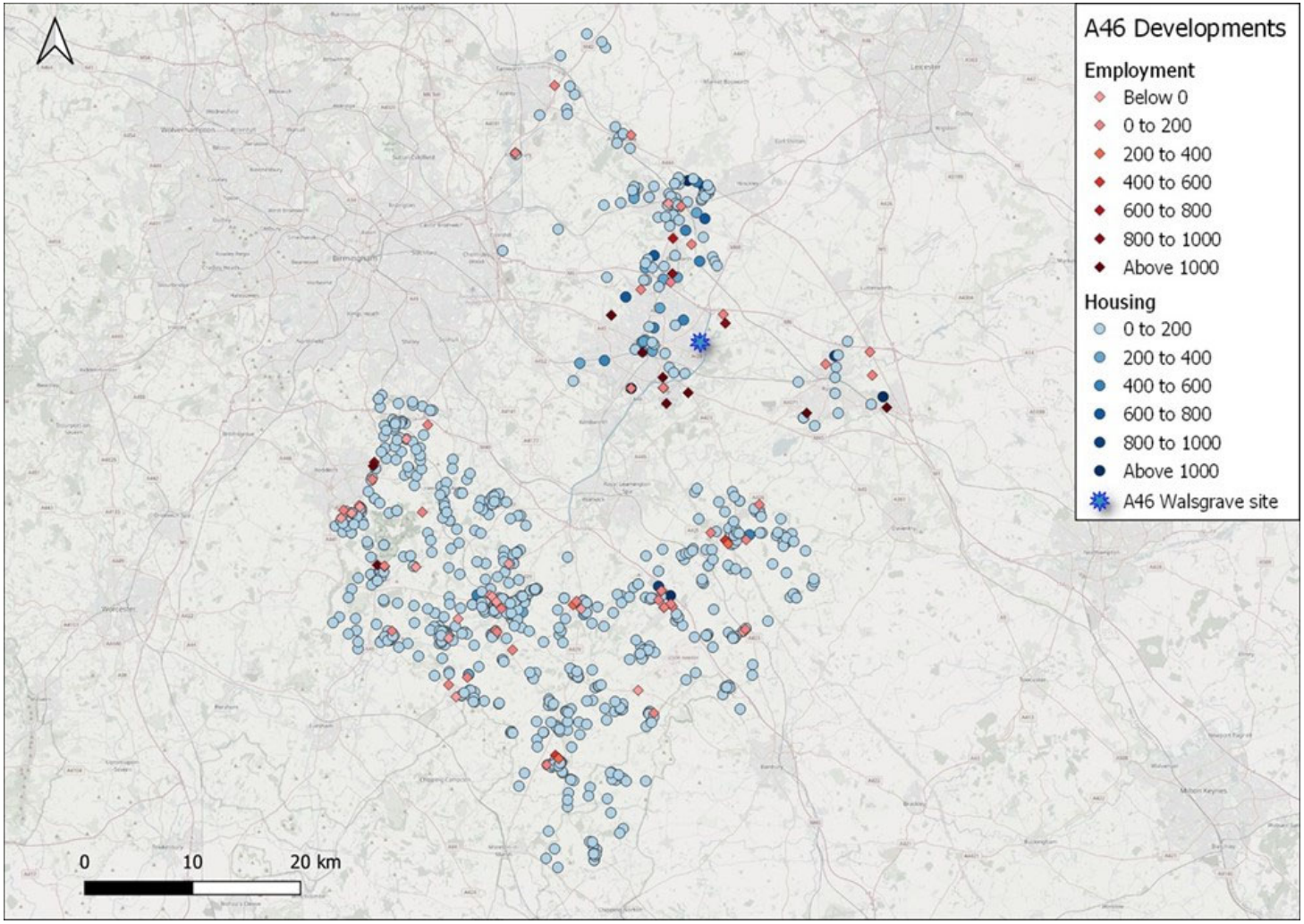
4.5.6. The categorisation and schedule for the potential developments included in the uncertainty log for the Scheme traffic modelling forecasting was agreed from correspondence with Coventry City Council and Warwickshire County Council (refer to the Consultation Report (**TR010066/APP/5.1**)).

4.5.7. The ‘Core’ scenario traffic growth forecast matrices are calculated by spatially allocating development trips from the uncertainty log using trip rates derived from the NTEM 8.0 data for cars and from the trip generation analysis system, TRICs for LGV and HGV. Non-development LGV and HGV growth was derived using NRTP22 growth factors. A constraining process is then carried out to control the development growth in accordance with the overall growth forecast from NTEM 8.0 data.

4.6. Local Developments

4.6.1. Following the TAG guidance, developments with the likelihood of at least ‘near certain’ or ‘more than likely’ were included in the forecast estimates. The locations of each land use development included within the uncertainty log can be seen in Figure 4-3.

Figure 4-3 Development locations



4.7. Infrastructure Schemes

4.7.1. The uncertainty log contains the significant local authority and National Highways network schemes. Based on TAG guidance, the schemes included in the Do Minimum scenario have a likelihood of at least 'near certain' or 'more than likely'.

4.7.2. For National Highways schemes and schemes across the wider area, that any infrastructure included within the MRTM2 model should be considered for the CoSTM Core scenario for consistency.

4.7.3. Of the available MRTM2 forecast years, the 2025 and 2031 forecasts were used to determine which forecast years schemes should be included in CoSTM. As such, each MRTM2 infrastructure scheme was reviewed and assigned to a CoSTM forecast year. Each scheme is set out in Table 4-2 and Table 4-3 for local and MRTM2 schemes respectively.

Table 4-2 Local Authority infrastructure schemes

Name	CoSTM Year	Name	CoSTM Year
Adelaide Road Avenue Rd	2023	A452/A46 Thickthorn	2023
Coventry Rd Gipsy Lane	2023	Whitley Development	2023
D3600 Hunters Lane Extension	2023	SUE Lubbersthorpe	2023
Avon Mill/ Hunters Lane Rugby	2023	Warwickshire Town Centre	2023
Bath Street Gyratory	2023	20mph Zones Birmingham	2023
SUE Access to Eastern Green	2023	A512 Widening M1J23	2023
Europa Way dualling	2023	Bromford gyratory	2023
A5/A426 Gibbet Lane	2023	East Midlands Gateway (EMG)	2023
A452 Kenilworth gyratory	2023	Southern Access (EMG)	2023
Ringway Queens, Coventry	2023	Transforming Nuneaton	2028
Rugby Radio Station	2023	A5 Towcester Relief Road	2028
Stank Island	2023	Broadnook development	2028
A46 Stoneleigh	2023		

Table 4-3 MRTM2 modelled infrastructure schemes

Source	Name	MRTM2 Year	CoSTM Year
Midlands Connect	A38 Bromsgrove A	2025	2023
Midlands Connect	A38 Bromsgrove B	2025	2028
Midlands Connect	A614	2025	2028
Midlands Connect	City East	2025	2028
Midlands Connect	A45 Damson	2031	2043
Midlands Connect	North Hykeham	2031	2043
Non-RIS	A44 Pinvin	2025	2023
Non-RIS	A46 Stanks	2025	2023
Non-RIS	A457 Dudley	2025	2023
Non-RIS	A512 DC	2025	2023
Non-RIS	A4440 Worcester	2025	2023
Non-RIS	DIRFT III	2025	2023
Non-RIS	M1 J20	2025	2023
Non-RIS	M1 J23	2025	2023
Non-RIS	Grantham	2025	2028
Non-RIS	A46 Stoneleigh	2025	2028
Non-RIS	Birchley Island	2025	2028
Non-RIS	Lincoln Bypass	2025	2028
Non-RIS	Nuneaton Relief Road	2025	2028
Non-RIS	A52 Wyvern	2031	2043
Non-RIS	HS2 Infrastructure	2031	2043
RIS1	A43 Abthorpe	2025	2023
RIS1	A45 A6 Chowns	2025	2023
RIS1	M1 J13 J16	2025	2023
RIS1	M1 J19	2025	2023
RIS1	M6 J2J4	2025	2023
RIS1	M6 J10	2025	2028
RIS1	A47 Wansford	2025	2028
RIS1	A52 Nottingham Junctions ABC	2025	2028
RIS1	A500 Etruria	2025	2028
RIS1	M6 J13J15	2025	2028
RIS1	M40 M42	2025	Shelved
RIS2	A38 Derby Junctions	2031	2028
RIS2	M54 M6 Toll	2025	2028
RIS2	Coventry Junctions	2025	2028
RIS2	M42 J6	2025	2028
RIS2	A46 DC Newark	2025	2043

4.7.4. Information regarding infrastructure schemes was requested from the local authorities for inclusion in the uncertainty log. However, it should be noted that not all data was provided at time of modelling. This included the recent cycling infrastructure schemes on Clifford Bridge Road, to be delivered by Coventry City Council. As such, this has been omitted from the strategic modelling carried out to date. Details of this scheme and others arising since the production of the uncertainty log in 2023 will be included in any further strategic modelling. Although data for the cycle scheme was received after completion of the strategic modelling, due to its location, testing of the impact of this scheme has been carried out within the operational modelling to understand its impact going forward as set out in Section 4.13.

4.8. Core Scenario Development

4.8.1. Highway networks have been produced for three forecasting scenarios for the two forecasting years (2028 and 2043).

4.8.2. The Do Minimum (DM) Scenario uses the 2018 Base Year network and is updated to include the infrastructure changes from the Uncertainty Log

4.8.3. Road tolls were updated based on MRTM2 data. This included the removal of the Severn crossing where charges were abolished in December 2018. Tolls post 2025 are held static in MRTM2 and this methodology has been retained.

4.8.4. The DM Scenario weas then updated to include the A46 Binley Junction Improvement Scheme. This utilised the data file provided with MRTM2 checked against the completed Scheme using as built drawings, Google aerial and street view mapping.

4.8.5. The Do Something (DS) Scenario builds on the DM with the inclusion of the Scheme. Key elements of the Scheme related to highway design include the following:

- A new grade separated junction located to the north of the existing Walsgrave roundabout
- The A46 mainline will be designed to 50mph between approximately the bridge over B4027 Brinklow Road to the south of the existing Walsgrave Junction and the overbridge for the bridleway extending from Farber Road to the north of the new junction
- The form of the junction consists of a ‘dumbbell’ roundabout arrangement connected by a bridge
- Slip roads connecting to the roundabouts on each side of the junction allowing for all movements to be available
- Extension of the existing B4082 to the new junction connecting into the western roundabout

- 40mph speed limit on the B4082 between the new junction and Clifford Bridge Road
- Pedestrian controlled crossing facilities on the eastern arm of the B4082 / Clifford Bridge Rd roundabout

4.8.6. Therefore, the only difference between the DM and DS networks are the inclusion of A46 Binley and Walsgrave Junction improvement Schemes as illustrated in Table 4-4.

Table 4-4 Network assumptions

Scenario	Schemes Included		
	Infrastructure changes - Uncertainty Log	Binley Scheme	Walsgrave Scheme
DM	Y	Y	N
DS	Y	Y	Y

4.9. Variable Demand Modelling

4.9.1. VDM was undertaken by retaining the VDM set up developed for MRTM2 adjusted for the CoSTM local network/zone structure.

4.9.2. The VDM calculates the increment in demand applied to the reference case forecasts generated by changes in road network congestion. To calculate this increment, the VDM alternates between demand matrix calculations and highway assignment model runs to achieve an appropriate equilibrium between demand and supply.

4.9.3. In this iterative process, the VDM calculates the growth in traffic demand across the network, between origin and destination pairs. Based on the origin-destination demand and the available highway network supply capacity, the CoSTM SATURN assignment model's algorithm calculates the equilibrium traffic flows on individual road links. The underlying principle of this equilibrium, or steady state, is outlined in DfTs WebTAG Unit M3.1 guidance.

4.9.4. Traffic arranges itself on networks such that the cost of travel on all routes used between each OD (Origin-Destination) pair is equal to the minimum cost of travel and all unused routes have equal or greater cost.

4.9.5. Based on this approach VDM is applied to derive the demand impacts of both the without-Scheme scenario (Do Minimum) as well as the with-Scheme scenario (Do Something).

4.9.6. The VDM was carried out for the following choice models:

- Time Period Choice (between four time periods (for OD-based demand segments, 4-5) or sixteen combinations of outbound and return time periods (for PA-based demand segments, 1-3))
- Trip Distribution (also referred to as Destination or Attraction Choice)

4.9.7. The convergence statistics for each forecast year indicated that all scenarios achieved a full model GAP lower than 0.2% as required by guidance.

4.10. Accounting for COVID-19

4.10.1. In line with current guidance (TAG M4 Forecasting and Uncertainty, Appendix B.3 and the National Highways Transport Planning Group Guidance Note TPG-TN-2023-01 Accounting for COVID-19 in Traffic Modelling and Appraisal), global adjustments were made to the post VDM matrices to account for COVID. A reduction factor was applied for each car user class as follows:

- Car - Employer Business: 9%
- Car – Commute: 6%
- Car – Other: 4%

4.10.2. No adjustment was made to LGV or HGV user classes in line with the above guidance.

4.11. Sensitivity scenarios

4.11.1. The TAG Uncertainty Toolkit (May 2023) sets out that forecast travel demand is a key driver of benefits in scheme appraisal. For this reason, value for money is particularly sensitive to assumptions around future travel demand.

4.11.2. DfT has developed a set of seven analytical scenarios for use in forecasting and appraisal namely the Common Analytical Scenarios (CAS). The CAS provide a narrative around the evolution of key drivers of uncertainty and allows a consistent approach to be taken for scheme assessment.

4.11.3. Assessment has been made of the seven CAS to determine their applicability to the A46 Walsgrave Scheme. Of these, two sensitivity tests were selected and assessed which are the High and Low Economy Common Analytical Scenarios and these were considered to likely form dependable upper and lower bounds to the assessment. Details of each scenario are set out in Table 4-5.

Table 4-5 CAS Summary and assessment

Scenario	High Economy	Low Economy
Narrative "*This scenario captures a future where…"*	...productivity growth returns to its long-term trend, and people become richer than we currently expect. Migration, and population in general, increases above official forecasts.	… productivity growth fails to return to historic levels and inwards migration is subdued, causing low levels of total population growth.
Core features or components	GDP – 10% higher in 2050 relative to Core assumptions by 2050. Population - GB total reaches 77.7m by 2050. Employment - 12% higher in 2050 relative to Core assumptions	GDP – 31% lower in 2050 relative to Core assumptions. Population - GB total reaches 64.6m by 2050. Employment - 7% lower in 2050 relative to Core assumptions.
To be assessed?	Yes	Yes
Reason	Scenario is stretching and likely to form upper bound to assessment.	Scenario is medium-stretching and likely to form a dependable lower bound to the assessment.

4.11.4. It should be noted that the High Economy scenario includes a direct link between the Scheme and the University Hospital Coventry in the DS scenario, as identified in the Uncertainty Log and in consultation with Coventry City Council. This University Hospital Coventry and Warwickshire link allows access to car parking for staff only but would not be feasible without inclusion of the Scheme and hence is not included in the DM modelling. A proportion of the Scheme benefits in the High Economy scenario would therefore be attributable to the inclusion of the University Hospital Coventry link. To understand the impact of this link, an additional DS scenario without the University Hospital Coventry link has been modelled for use in economic assessment. Only the provision of the link varies between these High Economy scenarios with no other changes to the matrices or networks.

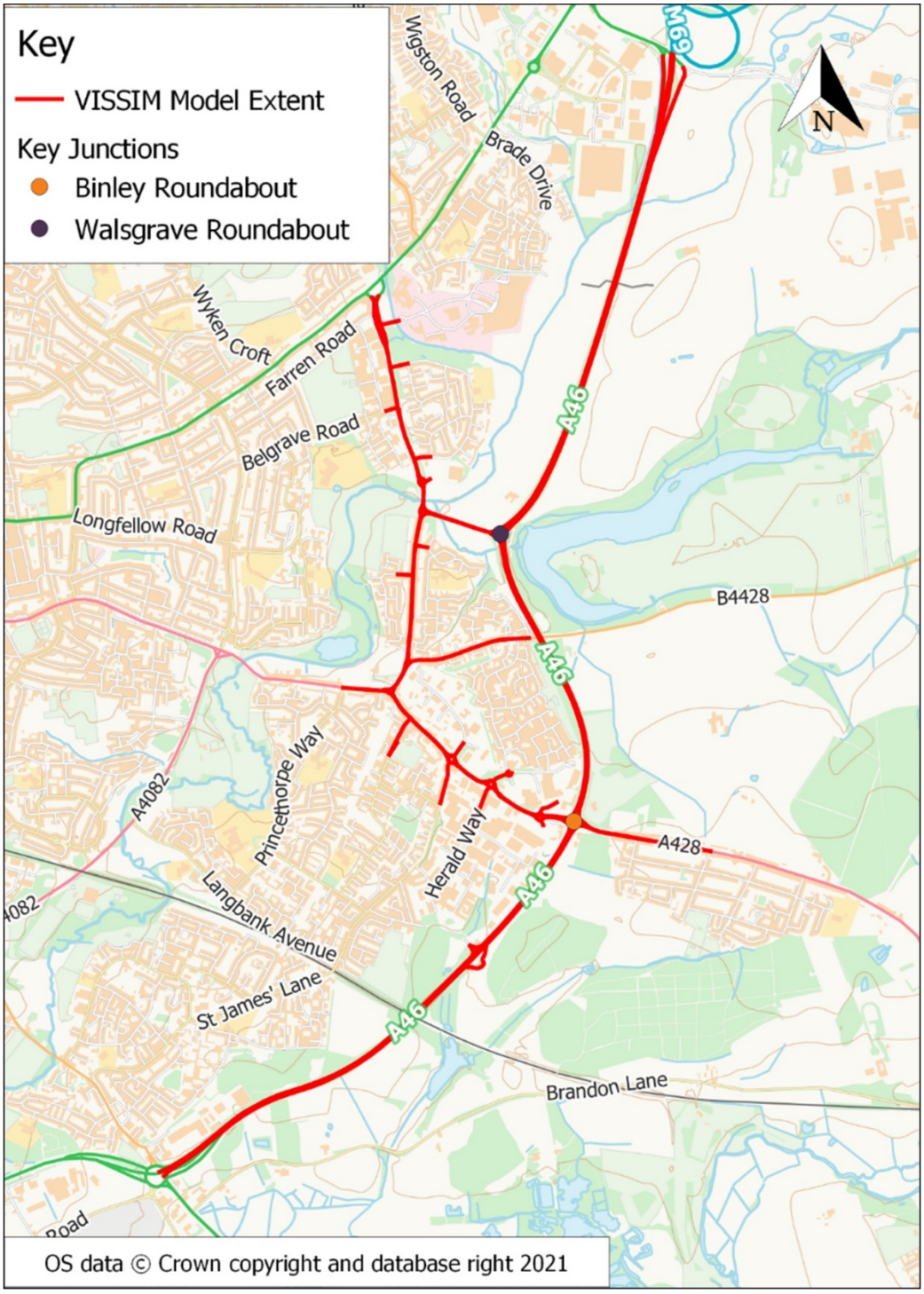
4.12. Overview of the Operational Modelling

4.12.1. A local area VISSIM[2] micro-simulation model has been constructed to aid the development of the Scheme. The principal purpose of the micro-simulation model is to undertake a detailed operational assessment of the Scheme. This assessment is then used to inform and refine the Scheme layout. Micro-simulation models include a representation of the time-continuous movement of individual vehicles travelling across a highway network. This small-scale individual representation of driver behaviour provides a suitable tool to assess the detailed operation of the Scheme.

[2] VISSIM is a micro-simulation modelling software developed by the PTV Group, Germany: https://www.ptvgroup.com/en/solutions/products/ptv-vissim/

4.12.2. The extents of the road network layout included in the VISSIM model of the Scheme is shown below in Figure 4-4.

Figure 4-4 A46 Walsgrave VISSIM model extents



4.12.3. The simulation periods are defined as:

- AM model 06:45 – 09:15 (Peak hour 07:45 - 08:45)
- PM model 15:45 – 18:15 (Peak hour 16:45 – 17:45)

4.12.4. The simulation period is 2.5 hours which comprises a 60-minute 'warm-up' period to populate the network, followed by a modelled peak hour where evaluation results are extracted, followed by a 30-minute 'cool-down' period where evaluation traffic can complete their journeys.

4.12.5. The traffic demand used in the VISSIM model has been derived from the wider area CoSTM model. To assess the model's robustness and ensure it provides a suitable platform for evaluating the Scheme's forecast year impacts, a separate VISSIM base year model validation exercise has been undertaken.

4.12.6. Minimal coding updates were included for the base year model to better reflect the on the ground layout in the area. These included a refinement of the Clifford Bridge Road/Tesco access junction and a correction to the traffic signal staging at the A428 Binley Road/ B4027 Brinklow Road junction.

4.12.7. The VISSIM base year model achieved the DfT required validation criteria and was therefore considered fit for the purpose of assessing the operational performance of the Scheme.

4.12.8. Modelled networks were developed for the 2028 Opening and 2043 Design years for the DM and DS scenarios.

4.12.9. For the Do Minimum model, the network was updated to refine the modelling of the A46 Binley junction improvement Scheme based on as built details. Coding was carried out in a consistent manner to the base model where required.

4.12.10. The Do Something model network was developed from the Do Minimum network by inclusion of the Scheme details with coding based on the Scheme design and carried out in a consistent manner to the Base and Do Minimum models.

4.13. Operational modelling sensitivity testing

4.13.1. Following assessment of both the strategic and the operational modelling, it was raised that Coventry City Council had very recently been on site to implement junction infrastructure changes at Binley Road/Brinklow Road and Brinklow Road/Clifford Bridge Road signalised junctions to provide improved provision for cyclists. These changes were not raised by Coventry City Council as part of the uncertainty log and as such were not included in the traffic modelling. The locations of the junctions are shown in Figure 4-5.

Figure 4-5 Brinklow Road junction infrastructure change locations

4.13.2. It was not considered proportionate to update all of the assessments already completed and this update will be included in full at the next stage of modelling.

4.13.3. However, given the location of both junctions, it is important to understand the impact of the changes on the Scheme. As such, a sensitivity test was set up for the 2043 AM and PM DM and DS operational models incorporating the revised junction layouts to understand the likely impacts of the changes.

4.13.4. The junction layout drawings were received from Coventry City Council but found to vary from the as-built layout. Site surveys were carried out to determine the current configuration of the junction although it should be noted that works may not be fully complete on site at this time although they appear to be fully operational.

4.13.5. The revisions to the layout include the key changes given below:

- Both the southbound and westbound approaches at the Binley Road/Brinklow Road are reduced from two lanes to one for the movement towards Binley Road westbound
- Priority at the Clifford Bridge Road/ Brinklow Road junction is altered so that the north-south movement becomes the dominant movement with Brinklow Road east becoming a side road
- Signal staging at both junctions has been updated
- Bus lanes between the two junctions operate in single lane sections blocking traffic when a bus is stopped

4.13.6. The impact of the above is to effectively reduce the capacity to vehicular traffic in the area. As the junctions are not included in the current Stage 3 CoSTM forecasting, the model is likely to be over predicting the capacity and hence traffic demand in this area so any assessment is very worst case and likely to over predict congestion and delay and traffic could reasonably be thought to reroute away from the area in future given the lower capacity conditions.

5. Current Network Performance

5.1. Introduction

5.1.1. This chapter provides an overview of the current operation of the road network. This assessment has been undertaken using the CoSTM SATURN highway network assignment base year model (2018).

5.1.2. This section also establishes the key links, junctions and journey time routes used for the assessment of the Scheme's impacts.

5.2. Overview of base year traffic flows and delays

5.2.1. The base year modelled traffic flows on the arms to the existing Walsgrave Junction are shown in Table 5-1. The traffic flows shown are peak hour flows, in passenger car units (PCUs) for the AM and PM peaks.

5.2.2. The A46 north and south approach arms, supporting traffic flows of around 2200-2800 PCUs, are the primary movements at the existing Walsgrave Junction. Approximately 500-900 PCUs utilise the B4082 to access the local road network through Clifford Bridge Road.

Table 5-1 2018 Base year traffic flows (PCU)

Link	Direction	AM	Inter	PM
A46 North of Walsgrave	SB	2,558	2,018	2,336
	NB	2,341	2,227	2,722
A46 South of Walsgrave	NB	2,549	2,276	2,462
	SB	2,236	2,110	2,202
B4082 west of A46 Walsgrave	EB	510	535	850
	WB	889	492	568

5.2.3. Volume over capacity ratios (V/C) and delay (s) on each approach are shown in Table 5-2. The ratio of (volume of traffic) flow to capacity, is an indicator of the likely performance of a road link. In general, a value above 85% indicates that a link is approaching congested conditions and so the Design Manual for Roads and Bridges guidance recommends links have a V/C ratio of below 85%.

5.2.4. The existing Walsgrave Junction is operating above capacity on all arms, particularly in the PM peak. The approaches with the highest V/C are the northern arm in the AM and the southern arm in the PM peak with 104% and 104% respectively. Accordingly, the above stated arms have the highest delays with 142s and 103s respectively. The Inter Peak (IP) is operating within capacity on each arm showing small delays with the southbound arm approaching capacity.

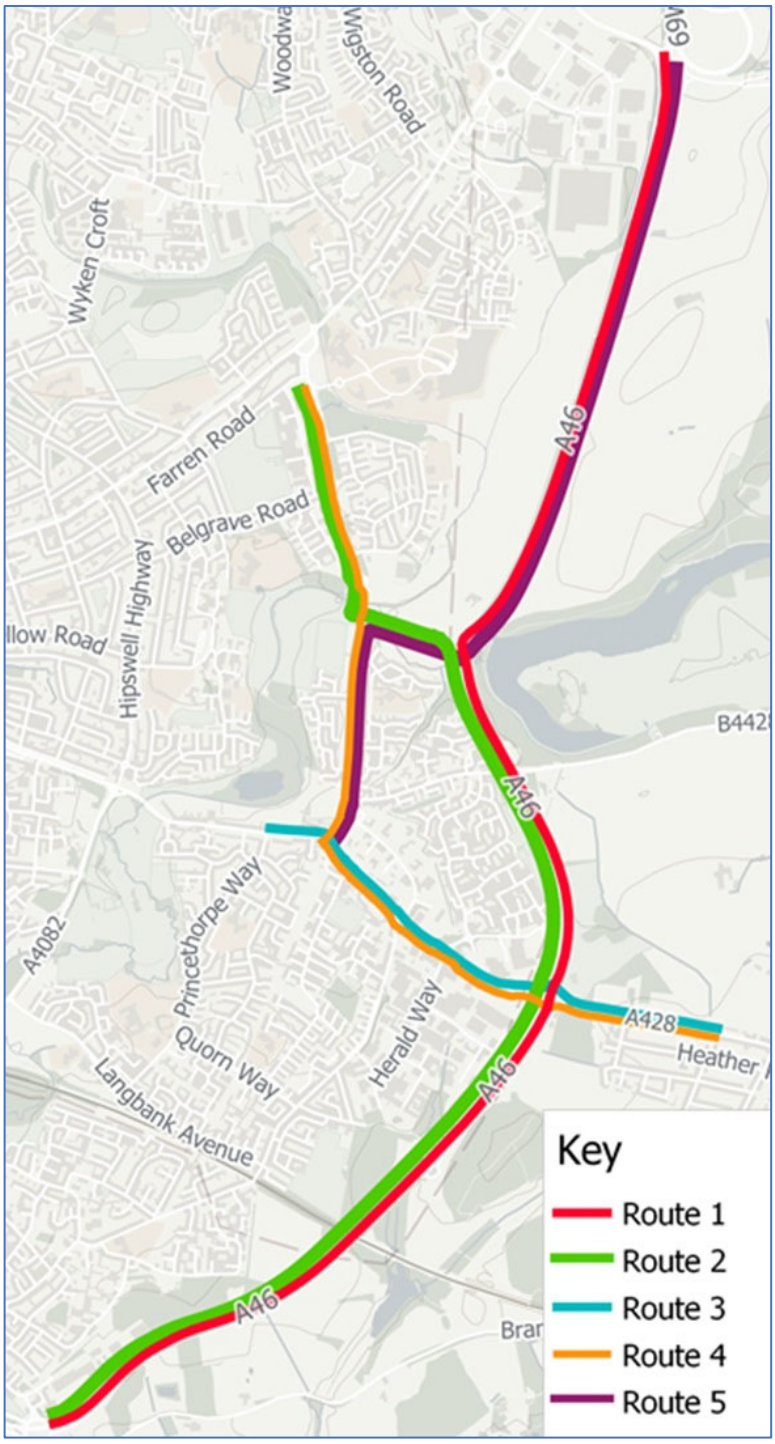
Table 5-2 2018 Base Year Traffic Delay and V/C Results

Link	Direction	AM		Inter		PM	
		Delays (Sec)	V/C %	Delays (Sec)	V/C %	Delays (Sec)	V/C %
A46 North of Walsgrave	**SB**	142	104	17	83	57	100
A46 South of Walsgrave	**NB**	11	92	7	77	103	104
B4082 west of A46 Walsgrave	**EB**	23	76	17	66	84	102

5.3. Overview of journey time routes

5.3.1. Analysis of journey time routes across the junction capture the change in congestion related delays across eleven different two-directional journey time routes defined across the study area. Thus, going forward, the comparison of Do Minimum and Do Something journey times in future years across the route sections can be used to highlight the positive benefits of the Scheme in terms of relieving congestion. The key journey time routes in the local area are shown in Figure 5-1.

Figure 5-1 Key journey time routes in local area



5.3.2. Average travel times and speeds across the routes given in Table 5-3 below. Please note that Route 4 shown in the above figure was established for the operational modelling and duplicates the east-west section of Route 3. In order to fully understand the impact on Clifford Bridge Road, this section is omitted from the data in the table below but is retained in the figure for consistency with the operational modelling routes.

Table 5-3 2018 Base year local route travel times and speeds

Route	2018 Base		AM Peak		Inter Peak		PM Peak	
	From	To	Time (mm:ss)	Average Speed (mph)	Time (mm:ss)	Average Speed (mph)	Time (mm:ss)	Average Speed (mph)
1	A46 North of Walsgrave	A46 South of Binley	08:28	29.6	05:31	45.4	06:37	37.8
	A46 South of Binley	A46 North of Walsgrave	05:56	43.5	05:39	45.7	11:17	22.9
2	A46 South of Binley	Clifford Bridge Rd north of B4082	05:25	34.7	05:03	37.2	10:39	17.7
	Clifford Bridge Rd north of B4082	A46 South of Binley	05:38	33.8	05:04	37.5	06:36	28.8
3	A428 west of A46 Binley	A428 east of A46 Binley	04:34	18.5	04:34	18.5	05:00	16.9
	A428 east of A46 Binley	A428 west of A46 Binley	04:39	18.1	04:39	18.1	04:31	18.6
4	Clifford Bridge Road / Brinklow Road	Clifford Bridge Road / Hospital Access	04:17	16.8	03:51	18.6	03:57	18.2
	Clifford Bridge Road / Hospital Access	Clifford Bridge Road / Brinklow Road	03:58	18.1	03:55	18.3	04:32	15.8
5	A46 North of Walsgrave	Clifford Bridge Rd south of B4082	02:55	37.7	02:32	43.4	02:54	37.9
	Clifford Bridge Rd south of B4082	A46 North of Walsgrave	02:50	40.2	02:47	40.9	04:05	27.9

5.3.3. As can be seen from the table above, the average speeds on the A46 are significantly affected by the delay at the existing Walsgrave Junction particularly in the AM and PM peak periods where average speeds for Route 1 fall below 30mph across the whole route southbound in the AM peak and northbound in PM peak.

5.3.4. Route 4, Clifford Bridge Road, sees average speeds of less than 20mph in all peak periods. This is likely a combined effect of local junction movements, level of traffic and other factors such as pedestrian movements.

5.4. Summary

5.4.1. Regional and local planning policy recognises the A46 as an important section of SRN. The Scheme is required to provide relief from traffic congestion and improve journey times by increasing the capacity of the remaining at-grade junction on the A46 between the M6 and the M40, benefitting both the strategic and local traffic needs and supporting future growth forecasts from Coventry City Council.

5.4.2. Base year journey times have been extracted from the strategic model for the A46 in the local area. This indicates that on this section of the A46, peak hour journey times are affected by delay at the junction reducing north-south average speeds to less than 30mph. The model has been used to assess junction performance and this analysis indicates that the majority of the approaches to the junction currently operate over or approaching capacity.

6. Future Year Network Performance

6.1. Introduction

6.1.1. This chapter provides an overview of the forecasted future year operation of the road network as well the impacts of the Scheme. Traffic forecasts for 2028 and 2043 have been prepared using the modelling approach outlined in Section 3. Using these models and assumptions Do Minimum and Do Something scenarios have been prepared. The comparison of these scenarios enables the impacts of the proposed Scheme to be evaluated.

6.1.2. The Do Minimum represents a without Scheme scenario, it includes all the changes unrelated to the Scheme which are considered more than likely to be in place prior to the respective future year.

6.1.3. The Do Something scenario includes the Scheme. The local development and transport infrastructure assumptions for both scenarios are detailed in Section 3.

6.2. Existing situation - traffic growth

6.2.1. Table 6-1 shows the forecasted change in traffic flows at Walsgrave Junction in the base year, 2028 and 2043 Do Minimum for the AM, Inter and PM peak periods.

6.2.2. Overall, there is expected to be an increase in traffic throughout the network across the wider Coventry and Warwickshire area. This traffic growth is derived from the modelling approach detailed in Section 3. In summary, the growth in traffic at an individual link level is calculated by the CoSTM SATURN highway assignment model based on the available road capacity and the total network wide demand.

6.2.3. Along the A46 approach arms to the Walsgrave Junction in both 2028 and 2043 Do Minimum traffic flows increase compared to the 2018 base model in all three peaks with the highest percentage increase in the IP. However, the exit arms for the roundabout northbound in the PM, and southbound and westbound in the AM show nearly zero percent or negative growth. This is indicative of the current junction forming a bottle neck restricting traffic from continuing its journey.

6.2.4. The traffic flow change between the 2043 DM and 2018 base year for the AM and PM peaks are shown in Figure 6-1 and Figure 6-2.

Table 6-1 2028 and 2043 Do Minimum and base year (2018) traffic flows (PCU)

Link	Direction	AM			IP			PM		
		Base	DM	DM-Base	Base	DM	DM-Base	Base	DM	DM-Base
2018 vs 2028										
A46 North of Walsgrave	SB	2,558	2,598	40	2,018	2270	252	2,336	2,474	138
	NB	2,341	2,454	113	2,227	2454	227	2,722	2,702	-20
A46 South of Walsgrave	NB	2,549	2,676	127	2,276	2562	286	2,462	2,709	247
	SB	2,236	2,243	7	2,110	2236	126	2,202	2,248	46
B4082 west of A46 Walsgrave	EB	510	572	62	535	562	27	850	903	53
	WB	889	854	-35	492	673	181	568	656	88
2018 vs 2043										
A46 North of Walsgrave	SB	2,558	2,635	77	2,018	2433	415	2,336	2,578	242
	NB	2,341	2,485	144	2,227	2485	258	2,722	2,686	-36
A46 South of Walsgrave	NB	2,549	2,662	113	2,276	2551	275	2,462	2,765	303
	SB	2,236	2,240	4	2,110	2240	130	2,202	2,250	48
B4082 west of A46 Walsgrave	EB	510	608	98	535	598	63	850	919	69
	WB	889	744	-144*	492	695	203	568	623	55

*Please note some differences may vary slightly due to rounding

Figure 6-1 Traffic flow change: 2043 DM vs 2018 – AM peak

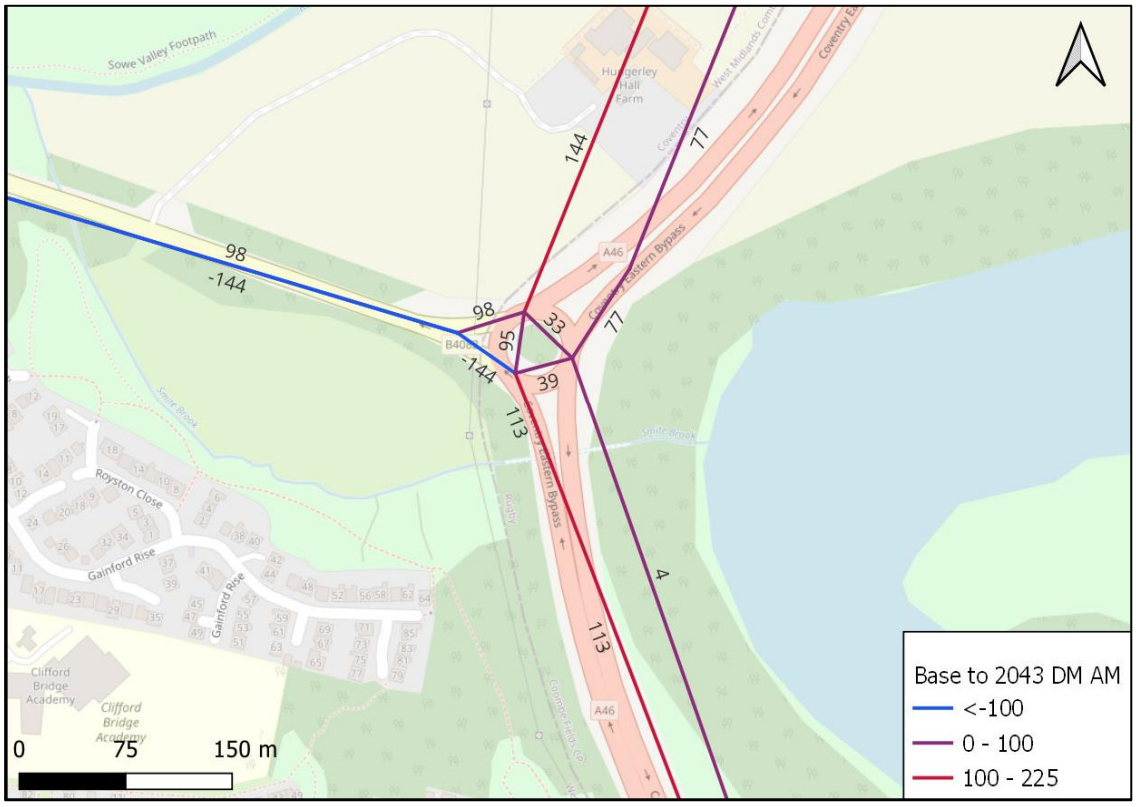
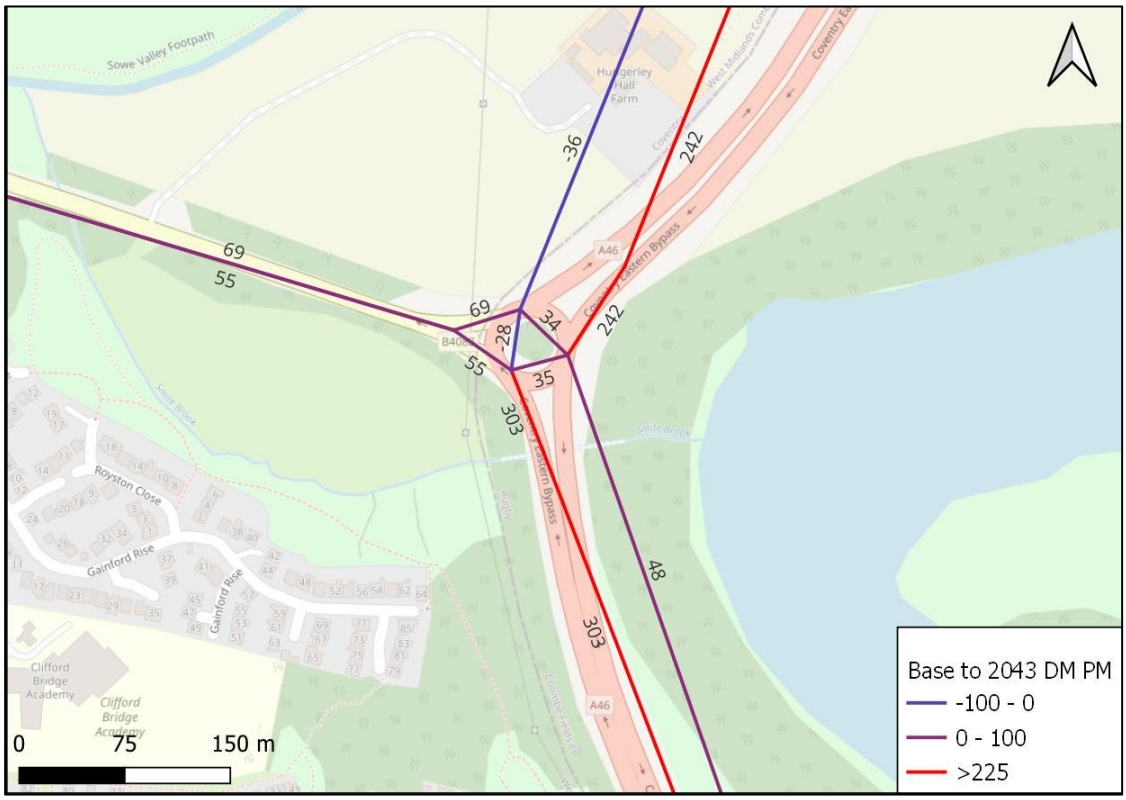


Figure 6-2 Traffic flow change: 2043 DM vs 2018 – PM peak



6.2.5. The increase in traffic flows approaching the junction corresponds with the increase in delays and V/C ratios shown in Table 6-2. All approaches to the junction exceed 85% capacity in 2028 and 2043 in all three peak periods.

6.2.6. Delays along the A46 southbound approach arm are forecasted to increase by approximately 1 minute in the AM and PM in 2028 and the AM in 2043. This increases to 2.5 mins in the PM for 2043. The largest increases in delay occur in the PM peak, along with V/C ratios increasing to 110% by 2043.

6.2.7. Along the A46 northbound approach, traffic delays are forecasted to increase in all scenarios by up to nearly 4 minutes for the PM peak in 2043 with V/C ratios increasing above 100% in 2028 and 2043.

6.2.8. On the B4082 approach arm, traffic delays are forecasted to increase in all scenarios with both the AM and PM seeing 1.5 minutes increase in 2043.

Table 6-2 2028 and 2043 Do Minimum and base year (2018) delay and V/C results

Link	Direction	AM		IP		PM	
		Delays (Sec)	V/C %	Delays (Sec)	V/C %	Delays (Sec)	V/C %
2018							
A46 North of Walsgrave	SB	142	104	17	83	57	100
A46 South of Walsgrave	NB	11	92	7	77	103	104
B4082 west of A46 Walsgrave	EB	23	76	17	66	84	102
2028							
A46 North of Walsgrave	SB	194	108	48	92	116	105
A46 South of Walsgrave	NB	85	103	9	91	276	114
B4082 west of A46 Walsgrave	EB	60	98	39	92	132	104
2043							
A46 North of Walsgrave	SB	198	108	72	100	209	110
A46 South of Walsgrave	NB	172	108	95	104	340	118
B4082 west of A46 Walsgrave	EB	110	103	76	101	171	107

6.2.9. Changes in forecast travel time and average speeds for the local journey time routes are shown in Table 6-3 and Table 6-4 overleaf.

6.2.10. Routes using the A46 between the Walsgrave and Tollbar junctions initially decrease with the introduction of the A46 Binley Scheme which opened to traffic in 2023. However, this is not seen for routes that do not use this section, where

travel times increase, such as for Route 5 between A46 north of Walsgrave and Clifford Bridge Road south. Travel times then generally increase over time from 2028 to 2043. This is reflected in the average speeds which increase between 2018 and 2028 for routes which utilise the new layout at A46 Binley but then decrease from 2028 to 2043.

Table 6-3 Forecast local route travel times

Route	Time (mm:ss)		AM Peak			Inter Peak			PM Peak		
	From	To	2018	2028	2043	2018	2028	2043	2018	2028	2043
1	A46 North of Walsgrave	A46 South of Binley	08:28	08:29	08:35	05:31	05:25	05:59	06:37	06:47	08:20
	A46 South of Binley	A46 North of Walsgrave	05:56	06:14	07:50	05:39	04:50	06:17	11:17	09:29	10:42
2	A46 South of Binley	Clifford Bridge Rd north of B4082	05:25	05:43	07:23	05:03	04:19	05:47	10:39	09:00	10:16
	Clifford Bridge Rd north of B4082	A46 South of Binley	05:38	05:10	06:01	05:04	04:50	05:23	06:36	06:28	07:11
3	A428 west of A46 Binley	A428 east of A46 Binley	04:34	04:16	04:18	04:34	04:16	04:17	05:00	04:20	04:24
	A428 east of A46 Binley	A428 west of A46 Binley	04:39	04:15	04:17	04:39	04:06	04:05	04:31	04:07	04:08
4	Clifford Bridge Road / Brinklow Road	Clifford Bridge Road / Hospital Access	04:17	04:15	04:17	03:51	03:54	03:55	03:57	04:02	04:12
	Clifford Bridge Road / Hospital Access	Clifford Bridge Road / Brinklow Road	03:58	04:02	04:09	03:55	03:57	04:01	04:32	04:39	04:49
5	A46 North of Walsgrave	Clifford Bridge Rd south of B4082	02:55	03:13	03:16	02:32	02:43	02:55	02:54	03:36	05:23
	Clifford Bridge Rd south of B4082	A46 North of Walsgrave	02:50	03:27	04:24	02:47	03:00	03:50	04:05	04:52	05:32

Table 6-4 Forecast local route average speeds

Route	Average Speed (mph)		AM Peak			Inter Peak			PM Peak		
	From	To	2018	2028	2043	2018	2028	2043	2018	2028	2043
1	A46 North of Walsgrave	A46 South of Binley	29.6	29.4	29.1	45.4	46.1	41.7	37.8	36.8	30.0
	A46 South of Binley	A46 North of Walsgrave	43.5	41.3	32.8	45.7	53.2	40.9	22.9	27.1	24.0
2	A46 South of Binley	Clifford Bridge Rd north of B4082	34.7	32.8	25.4	37.2	43.4	32.4	17.7	20.8	18.2
	Clifford Bridge Rd north of B4082	A46 South of Binley	33.8	36.5	31.3	37.5	39.0	35.0	28.8	29.1	26.2
3	A428 west of A46 Binley	A428 east of A46 Binley	18.5	19.8	19.6	18.5	19.8	19.7	16.9	19.5	19.2
	A428 east of A46 Binley	A428 west of A46 Binley	18.1	20.4	20.2	18.1	21.1	21.2	18.6	21.0	21.0
4	Clifford Bridge Road / Brinklow Road	Clifford Bridge Road / Hospital Access	16.8	16.9	16.8	18.6	18.4	18.3	18.2	17.8	17.1
	Clifford Bridge Road / Hospital Access	Clifford Bridge Road / Brinklow Road	18.1	17.8	17.3	18.3	18.2	17.9	15.8	15.4	14.9
5	A46 North of Walsgrave	Clifford Bridge Rd south of B4082	37.7	34.2	33.7	43.4	40.5	37.7	37.9	30.6	20.4
	Clifford Bridge Rd south of B4082	A46 North of Walsgrave	40.2	32.6	25.6	40.9	37.5	29.4	27.9	23.1	20.3

6.2.11. In summary, in the Do Minimum scenario, traffic growth between 2015-2028 will put additional pressure on the gyratory. This will result in vehicles experiencing increased delay on key approach arms, particularly in the PM peak. Further traffic growth is forecasted between 2028-2043. This additional growth will exacerbate the existing congestion issues at the A46 Walsgrave Junction.

6.3. Scheme Construction

6.3.1. Traffic management measures during construction tend to result in changes to journey times and also changes in traffic flow on affected links. This section describes the traffic modelling of the construction phases of the Scheme. This includes an overview of the impact on traffic flows and journey times for each of the construction phases. Specific details relating to construction sequences and traffic management phases can be found in the OTMP (**TR010066/APP/7.5**).

6.3.2. The traffic management plan consists of seven phases between October 2026 and June 2028. All existing routes are maintained during the day time under

reduced speed limits while traffic management is in place and supplemented by a limited number of overnight closures for varying sections of the route.

6.3.1. Transport users incur additional costs when the construction and / or maintenance works affect the highway network. The monetary value of impact of these measures on road users (i.e. the impacts of users experiencing increased journey times due to traffic management) has been assessed using the strategic model and the economic appraisal program, TUBA. The strategic model gives a detailed representation of available route choices and their implications for congestion levels and journey times.

6.3.2. Table 6-5 summarises the traffic management information by phase.

Table 6-5: Traffic management phases

Phase	Start Date	End Date	Static (24/7) TM Details	Static TM Duration (Days)	Night closures (8pm - 6am) TM Details	Nights No. of shifts
1	13/10/26	06/01/27	As (1a) below	86	NB and SB Laybys	Permanent closure
					B4082 LH turn lane, Lane 1 of A46 NB	10
1a	07/01/27	12/05/27	A46 NB - Narrow Lanes (all lanes running) from existing roundabout to northern extent of scheme	126	A46 NB Walsgrave to Central Blvd	2
			A46 SB - Narrow Lanes (all lanes running) from northern extent of the scheme to the existing roundabout.		A46 SB Central Blvd to Walsgrave	2
			40mph limit in place across scheme extents		A46 SB Walsgrave to Binley	2
			Existing A46 Roundabout operating on existing alignment		B4082	15
			B4082: Narrow Lanes as traffic is pushed onto south edge of pavement.		A46 NB Walsgrave to Central Blvd	10
					A46 SB Central Blvd to Walsgrave	10
					A46 NB Walsgrave to Central Blvd and A46 SB Clifton Blvd to Walsgrave	1
2	13/05/27	06/09/27	A46 NB (2 lanes) from existing roundabout to northern extent of scheme: on new (B4082) alignment. Dumbbells not connected.	117	B4082 and A46 NB Binley to Central Blvd	2
			A46 SB (2 lanes) from northern extent of scheme to existing roundabout: on new (slip lane) alignment. Dumbbells not connected.		A46 SB Central Blvd to Binley	2
			A46 SB - Narrow Lanes (all lanes running) from existing roundabout to southern extent of the scheme.			
			40mph limit in place across scheme extents			
			B4082 and existing A46 Roundabout operating on existing alignment			
3	07/09/27	01/12/27	A46 NB (2 lanes) from existing roundabout to northern extent of scheme: on new (B4082) alignment. Dumbbells not connected	86	A46 SB Central Blvd to Binley	2
			A46 SB (2 lanes) from northern extent of scheme to existing roundabout in contraflow on newly built A46 NB		A46 SB Central Blvd to Binley	10
			40mph limit in place across scheme extents			

Phase	Start Date	End Date	Static (24/7) TM Details	Static TM Duration (Days)	Night closures (8pm - 6am) TM Details	Nights No. of shifts
			B4082 and existing A46 Roundabout operating on temporary alignment			
4	02/12/27	03/02/28	A46 NB - Narrow Lanes (all lanes running) from southern extent to roundabout as NB traffic pushed towards verge	64	B4082 and A46 NB Binley to Central Blvd	4
			A46 SB - Narrow Lanes (all lanes running) from roundabout to southern extent as SB traffic pushed into existing Lane 1 and widening		B4082 and A46 SB Central Blvd to Binley	4
			B4082 operating on final alignment			
			A46 NB and SB north of roundabout operating on final alignment			
			40mph limit in place across scheme extents			
5	04/02/28	28/03/28	A46 NB - Narrow Lanes (all lanes running) from southern extent to roundabout as NB pushed onto SB Lane 2 and central reserve	54	B4082 and A46 NB Binley to Central Blvd	2
			A46 SB - Narrow Lanes (all lanes running) from roundabout to southern extent as SB traffic pushed into existing Lane 1 and widening			
			40mph limit in place across scheme extents			
6	29/03/28	15/06/28	A46 SB - Narrow Lanes (all lanes running) from roundabout to southern extent	79	A46 NB Binley to Central Blvd	2
			40mph limit in place across scheme extents		A46 SB Central Blvd to Binley	2
					A46 NB Lane 1 closure and A46 SB closure (Walsgrave to Binley)	25
					A46 SB Central Blvd to Binley	2
					A46 NB Binley to Central Blvd	5
					A46 SB Central Blvd to Binley	5

6.3.3. Each of the above construction phases has been modelled in a single-year assignment run using the demand derived from the 2028 DM model. The outputs from the construction modelling assignment have been compared against the DM in TUBA in order to quantify the effects of construction. In modelling terms, not all phases require separate models. For example, Phases 1, 1a and 2 are effectively identical within the strategic model and the same networks can be used for both phases.

6.3.4. No adjustment to traffic was made to rebase from 2028 to 2026/2027 for the construction phases that occur in these years, and this was considered a worst-case with affected modelled flows potentially being higher than would occur in the two years prior to scheme opening.

6.3.5. Table 6-6 presents a comparison of the traffic flows on the A46 to the north and south of the A46 Walsgrave junction and on the B4082 approach to the junction. Data is presented for the daytime weekday peak periods modelled based on the grouped phases as noted above. (Please note that DM flows may vary slightly from the main traffic model assessment due to the cordoning process carried out for the construction assessment.)

6.3.6. It can be seen from Table 6-6 that traffic flows on the A46 remain relatively stable during phases 1, 1a and 2 of construction with the most significant change the decrease in trips on the A46 in both directions in the inter peak.

6.3.7. More significant changes are seen in phase 3 with flows on the A46 reducing in all peaks in both directions. However, this is not offset by a similar increase in traffic on Clifford Bridge Road indicating that trips are rerouting over a wider area rather than via the local road network.

6.3.8. For phases 4, 5 and 6, reductions in flows are seen on the B4082 in all peak periods. Flows on the A46 increase in the AM peak southbound but decrease northbound and the converse is true for the PM peak with increased flows northbound and decreased southbound. This is likely influenced by the tidal nature of flows in these peaks especially where other strategic routes incur congestion during these peak times. In the inter peak, where flows are lower than the AM and PM, traffic is seen to avoid the A46 and B4082 but, again, the reduction in flows on the A46 is not fully replicated by an increase on Clifford Bridge Road although this does show an increase in flows to a lower level, indicating a combination of wider area and local road rerouting to avoid the construction area.

Table 6-6: Traffic flow impact of construction (PCU)

Location	Without Scheme	Construction Phase:		
		Phase 1, 1a & 2	Phase 3	Phase 4, 5 & 6
AM Peak				
A46 North of Walsgrave NB	2454	2387	2352	2401
A46 North of Walsgrave SB	2596	2481	2481	2673
A46 South of Walsgrave NB	2678	2637	2644	2364
A46 South of Walsgrave SB	2243	2235	2223	2378
B4082 WB	855	851	626	554
B4082 EB	572	488	169	297
Clifford Bridge Rd South of B4082 NB	690	632	599	729
Clifford Bridge Rd South of B4082 SB	914	897	880	914
Inter Peak				
A46 North of Walsgrave NB	2453	2186	2187	2205
A46 North of Walsgrave SB	2271	2017	2041	2018
A46 South of Walsgrave NB	2562	2285	2316	2071
A46 South of Walsgrave SB	2237	2093	2076	1791
B4082 WB	673	563	460	387
B4082 EB	562	539	366	295
Clifford Bridge Rd South of B4082 NB	597	646	613	711
Clifford Bridge Rd South of B4082 SB	623	634	572	759
PM Peak				
A46 North of Walsgrave NB	2700	2665	2743	3208
A46 North of Walsgrave SB	2474	2344	2272	2424
A46 South of Walsgrave NB	2709	2659	2853	3029
A46 South of Walsgrave SB	2248	2254	2186	2181
B4082 WB	656	685	308	666
B4082 EB	903	860	277	602
Clifford Bridge Rd South of B4082 NB	1135	1112	1032	1004
Clifford Bridge Rd South of B4082 SB	991	1037	1025	1083

6.3.9. Travel time data for the north-south movement on the A46 through the traffic management area has been analysed for the daytime weekday peak periods (Route 1 shown in Figure 5-1). Travel times and differences are shown in Table 6-7 overleaf:

Table 6-7:Travel time impact of construction (mm:ss)

From	To	DM	Phase 1, 1a & 2	Ph 1-2 change from DM	Phase 3	Ph 3 change from DM	Phase 4, 5 & 6	Ph 4-6 change from DM
AM Peak								
A46 North of Walsgrave	A46 South of Binley	08:28	09:06	00:38	08:31	00:03	07:24	01:04
A46 South of Binley	A46 North of Walsgrave	06:15	07:45	01:30	07:45	01:30	07:13	00:58
Inter Peak								
A46 North of Walsgrave	A46 South of Binley	05:27	06:31	01:04	06:26	00:59	06:46	01:19
A46 South of Binley	A46 North of Walsgrave	04:50	07:17	02:27	07:15	02:25	06:56	02:06
PM Peak								
A46 North of Walsgrave	A46 South of Binley	06:49	07:39	00:50	07:02	00:13	07:11	00:22
A46 South of Binley	A46 North of Walsgrave	09:28	10:48	01:20	10:30	01:02	08:45	00:43

6.3.10. As can be seen from the above table, the most significant increase in journey time is during the inter peak in all phases at between 2 and 2.5 minutes. It is likely that the interpeak sees the most significant increase as this is the period that would normally suffer the least congestion. For the AM and PM, the reduction in traffic flow leads to less congestion at the existing A46 Walsgrave junction offsetting some of the delay caused by the traffic management.

6.3.11. Data input comprising of trip, flow weighted average travel time and travel distance matrices for each user class were extracted for each model scenario (DM and each Phase) and used as an input to TUBA. The results of all phase assessments were then combined to present the total user impact during construction. The impact of delay due to construction is monetised as set out in Section 5 of the Case for the Scheme (**TR010066/APP/7.1**).

6.3.12. The environmental impacts due to construction are set out in Section 2.6 of ES Chapter 2 (The Scheme) (**TR010066/APP/6.1**).

6.4. Impact of the Scheme

6.4.1. Table 6-8 and Table 6-9 set out the link flow differences at key locations in the local area for DM and DS at the locations shown in Figure 6-3.

Figure 6-3 Link flow extraction locations

6.4.2. The 2028 and 2043 tables generally show an increase in flows on the A46 between the DM and the DS, and a reduction in flows on the local roads with the exception of the IP in 2028 discussed later in 6.4.8.

6.4.3. In 2028 from the DM to the DS, the flows on A46 north of Walsgrave increase by 18% in the AM peak and 35% in the PM peak northbound and similarly southbound 27% in the AM peak and 18% in the PM peak. Similar increases are also seen here in 2043.

6.4.4. These increased flows on the A46 are offset by decreases from DM to DS on the local/urban roads. The B4082 west of A46 Walsgrave eastbound sees a -43% decrease in the AM peak and -35% decrease in the PM peak in 2028. This signifies traffic flowing through the A46 instead of (diverting) through the Walsgrave area.

6.4.5. On the A428 Brandon Road near the junction with Brinklow Road, two-way flows are seen to decrease in both 2028 and 2043 with the exception of the IP in 2028 which sees a small increase. The PM peak shows the highest level of flow reduction for this link with the introduction of the Scheme.

6.4.6. In 2028, Clifford Bridge Road, north of the B4082, sees decreases of -15% in the AM and -6% in the PM peak northbound and -15% and -7% in AM and PM peaks southbound respectively.

6.4.7. Similar reductions are seen in the 2043 forecast year on Clifford Bridge Road, north of the B4082, and also on Clifford Bridge Road to the south of the B4082. The exception is the PM peak northbound north of the B4082 in 2043 which sees an increase in trips over a short distance. The reduced flow in this area between DM and DS is likely due to fewer delays on the A46 so behaviour patterns favour the dual carriageway in the DS scenario.

6.4.8. The exception is in the IP in 2028 where there are decreases in flow between the DM and DS on the A46 through the whole area and on the B4082 in both directions. This appears to be as a direct result of the increased travel distance (and hence travel time) of the new junction arrangement. Where flows in the scenarios are relatively low, the travel time of using the now longer realigned B4082 is slightly less desirable than other routes over the wider area with more traffic on the A444 north of Stivichall Interchange, the B4082 east of the A444 and Ansty Road.

6.4.9. This is not seen in the 2043 and 2061 IP scenarios which follow the pattern of the AM and PM. This is as flow levels and travel times increase making the new junction alignment more competitive for travel times.

Table 6-8 2028 Local area modelled flow differences (PCUs)

2028		AM Peak			Inter Peak			PM Peak		
Link	**Direction**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**
A46 North of Walsgrave	NB	2,454	2,905	451	2,454	2,477	23	2,702	3,650	948
	SB	2,598	3,294	696	2,270	2,315	45	2,474	2,931	457
A46 South of Walsgrave	NB	2,676	2,855	179	2,562	2,332	-230	2,709	3,533	824
	SB	2,243	3,092	849	2,236	2,187	-50	2,248	2,744	496
B4082 west of A46 Walsgrave	EB	572	326	-246	562	353	-209	903	585	-318
	WB	854	478	-376	673	337	-336	656	656	0
A428 west of A46 Binley	EB	765	802	37	896	879	-17	933	1,139	206
	WB	1,071	1,197	126	808	895	88	755	813	58
A428 east of A46 Binley	EB	532	593	60	566	553	-13	638	602	-37
	WB	833	861	28	620	606	-14	657	719	62
A46 South of Binley	NB	3,037	3,120	83	2,549	2,408	-142	3,029	3,383	354
	SB	2,599	3,232	633	2,366	2,299	-67	2,764	3,037	273
Clifford Bridge Rd north of B4082	NB	955	811	-144	916	734	-182	1,058	1,121	63
	SB	894	756	-138	829	681	-148	1,159	1,077	-82
Clifford Bridge Rd south of B4082	NB	691	666	-25	598	639	42	1,134	908	-226
	SB	913	763	-150	622	570	-52	987	934	-53
A428 Brandon Rd east of Brinklow Rd	EB	1,234	1,150	-84	843	819	-24	938	860	-79
	WB	707	725	18	844	905	61	1,092	993	-100

Table 6-9 2043 Local area modelled flow differences (PCUs)

2043		AM Peak			Inter Peak			PM Peak		
Link	**Direction**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**
A46 North of Walsgrave	NB	2,485	3,289	804	2,485	3,030	545	2,686	3,672	986
	SB	2,635	3,286	651	2,433	2,660	227	2,578	3,365	787
A46 South of Walsgrave	NB	2,662	3,222	560	2,551	2,826	275	2,765	3,663	898
	SB	2,240	3,154	914	2,240	2,520	280	2,250	3,074	823
B4082 west of A46 Walsgrave	EB	608	488	-120	598	478	-120	919	623	-295
	WB	744	554	-190	695	414	-281	623	905	282
A428 west of A46 Binley	EB	795	811	16	915	946	31	1,057	1,208	151
	WB	1,145	1,184	40	820	962	142	872	866	-6
A428 east of A46 Binley	EB	477	510	33	516	517	2	535	568	33
	WB	825	899	74	590	596	6	623	626	3
A46 South of Binley	NB	3,173	3,428	256	2,700	2,918	218	3,174	3,573	399
	SB	2,748	3,376	627	2,559	2,674	115	2,933	3,384	451
Clifford Bridge Rd north of B4082	NB	969	927	-42	931	815	-116	1,161	1,375	214
	SB	1,012	947	-65	905	775	-130	1,224	1,150	-75
Clifford Bridge Rd south of B4082	NB	785	741	-44	650	703	53	1,193	928	-265
	SB	964	827	-137	721	600	-121	963	986	23
A428 Brandon Rd east of Brinklow Rd	EB	1,288	1,205	-82	924	817	-107	938	902	-36
	WB	793	755	-38	930	932	2	1,151	1,016	-135

6.4.10. As the introduction of the Scheme introduces a change in the links used to perform required travel movements, it is not always easy to understand the impact of the Scheme by looking at simple difference plots for delay. For example, trips moving from the A46 to the B4082 would use the new junction alignment requiring travel on additional link sections.

6.4.11. As such, analysis of the impact of the Scheme on travel times has been carried out based on key movements through and around the Scheme area. Five routes have been developed for the operational modelling and these have been used in this analysis for consistency. These routes are shown on Figure 5-1 but note, in order to fully distinguish the impact on Clifford Bridge Road, the section of Route 4 travelling along the A428 has been omitted for this analysis as this is covered by Route 3.

6.4.12. The travel times presented are averages for all vehicle types over the modelled average peak hour. The differences in travel times are presented in Table 6-10 to Table 6-11.

Table 6-10 2028 Travel time differences in minutes: seconds (Core scenario)

	2028 Core		AM Peak			Inter Peak			PM Peak		
	From	To	DM	DS	DS-DM	DM	DS	DS-DM	DM	DS	DS-DM
1	A46 North of Walsgrave	A46 South of Binley	08:29	05:44	-02:45	05:25	05:05	-00:20	06:47	05:25	-01:22
	A46 South of Binley	A46 North of Walsgrave	06:14	05:10	-01:04	04:50	04:51	00:01	09:29	07:20	-02:09
2	A46 South of Binley	Clifford Bridge Rd north of B4082	05:43	05:57	00:14	04:19	05:36	01:17	09:00	06:37	-02:23
	Clifford Bridge Rd north of B4082	A46 South of Binley	05:10	06:41	01:31	04:50	06:07	01:17	06:28	06:34	00:06
3	A428 west of A46 Binley	A428 east of A46 Binley	04:16	04:17	00:01	04:16	04:16	00:00	04:20	04:25	00:05
	A428 east of A46 Binley	A428 west of A46 Binley	04:15	04:19	00:04	04:06	04:07	00:01	04:07	04:09	00:02
4	Clifford Bridge Road / Brinklow Road	Clifford Bridge Road / Hospital Access	04:15	04:08	-00:07	03:54	03:45	-00:09	04:02	04:01	-00:01
	Clifford Bridge Road / Hospital Access	Clifford Bridge Road / Brinklow Road	04:02	03:53	-00:09	03:57	03:50	-00:07	04:39	04:27	-00:12
5	A46 North of Walsgrave	Clifford Bridge Rd south of B4082	03:13	03:10	-00:03	02:43	03:02	00:19	03:36	03:16	-00:20
	Clifford Bridge Rd south of B4082	A46 North of Walsgrave	03:27	02:56	-00:31	03:00	02:54	-00:06	04:52	04:42	-00:10

Table 6-11 2043 travel timed differences in minutes: seconds

	2043 Core		AM Peak			Inter Peak			PM Peak		
	From	To	DM	DS	DS-DM	DM	DS	DS-DM	DM	DS	DS-DM
1	A46 North of Walsgrave	A46 South of Binley	08:35	05:53	-02:42	05:59	05:15	-00:44	08:20	05:47	-02:33
	A46 South of Binley	A46 North of Walsgrave	07:50	05:56	-01:54	06:17	05:04	-01:13	10:42	08:16	-02:26
2	A46 South of Binley	Clifford Bridge Rd north of B4082	07:23	06:26	-00:57	05:47	05:45	-00:02	10:16	07:16	-03:00
	Clifford Bridge Rd north of B4082	A46 South of Binley	06:01	06:55	00:54	05:23	06:18	00:55	07:11	06:55	-00:16
3	A428 west of A46 Binley	A428 east of A46 Binley	04:18	04:17	-00:01	04:17	04:18	00:01	04:24	04:28	00:04
	A428 east of A46 Binley	A428 west of A46 Binley	04:17	04:19	00:02	04:05	04:08	00:03	04:08	04:08	00:00
4	Clifford Bridge Road / Brinklow Road	Clifford Bridge Road / Hospital Access	04:17	04:14	-00:03	03:55	03:49	-00:06	04:12	04:23	00:11
	Clifford Bridge Road / Hospital Access	Clifford Bridge Road / Brinklow Road	04:09	04:04	-00:05	04:01	03:54	-00:07	04:49	04:35	-00:14
5	A46 North of Walsgrave	Clifford Bridge Rd south of B4082	03:16	03:13	-00:03	02:55	03:05	00:10	05:23	03:34	-01:49
	Clifford Bridge Rd south of B4082	A46 North of Walsgrave	04:24	03:21	-01:03	03:50	03:02	-00:48	05:32	05:22	-00:10

6.4.13. In 2028, when comparing the DS to the DM, improvements are seen on the A46 for Route 1 in both directions with the exception of the Inter Peak which stays relatively stable in line with the flow changes highlighted in Section 6.4.8.

6.4.14. For both the A46 north to Clifford Bridge Road south and A46 south to Clifford Bridge Road north, some increases in travel time of up to a minute and a half are seen when conditions are less congested due to the additional travel distance required to complete the movement. This is illustrated when looking at the time/distance graph for Route 2 replicated in Figure 6-4 and Figure 6-5 below. Between the 3km and 4km section of the route, the steeper increase in time in the northbound DM replicates the northbound queue on the A46 Walsgrave approach. Similarly, this occurs for the southbound route prior to reaching the 1km mark on the eastbound approach to Walsgrave. The DS line does not show the same steep increase here but steadily builds to a higher final time value over the longer distance travelled. This is compounded by the reduced speed limit on the A46 (50mph) and the new pedestrian crossing on the B4082 introduced as part of the Scheme which both add time to the overall route.

Figure 6-4 Sub-Route 2 northbound time-distance graph (2028 AM)

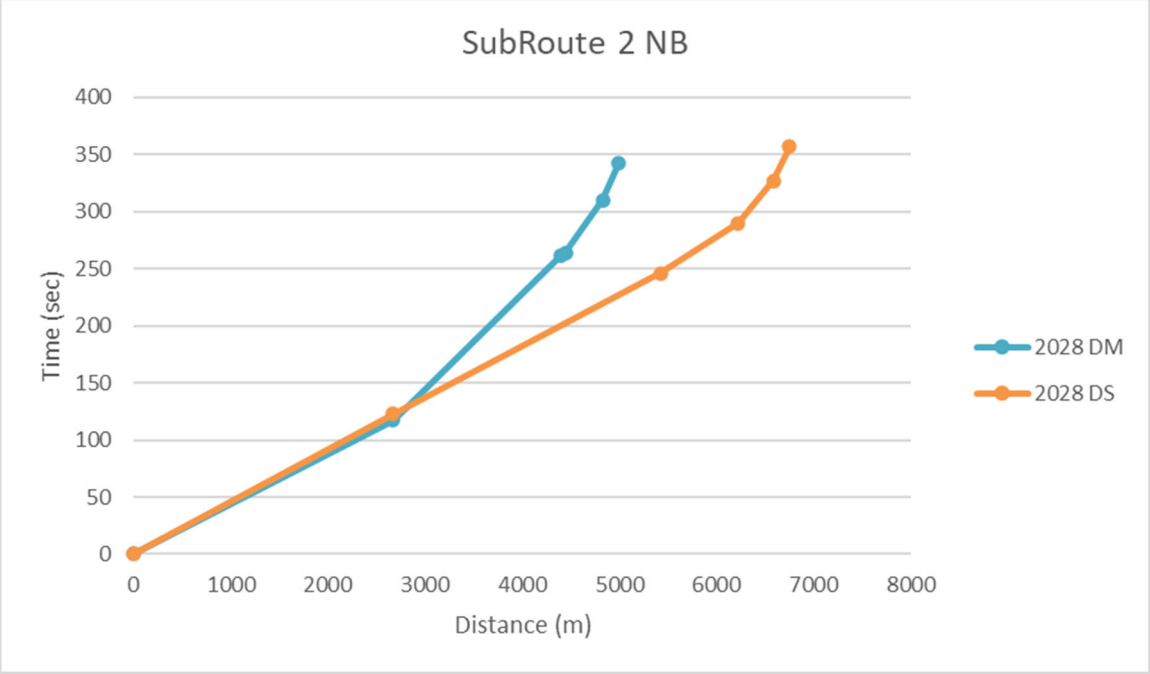
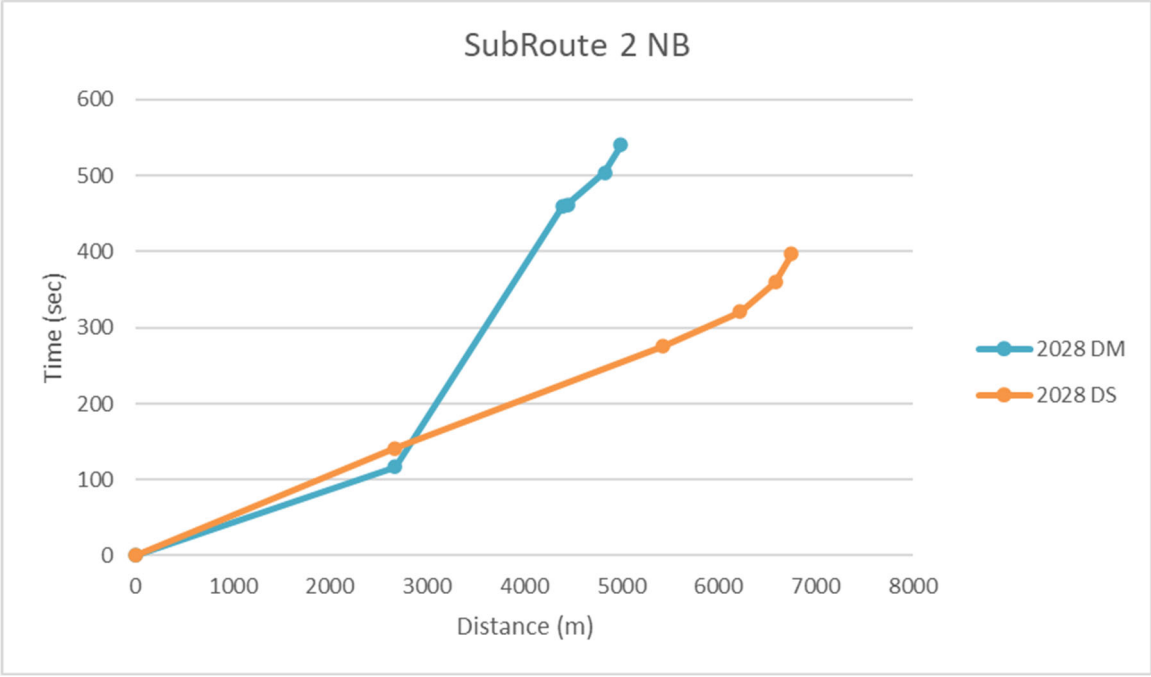


Figure 6-5 Sub-Route 2 southbound time-distance graph (2028 AM)

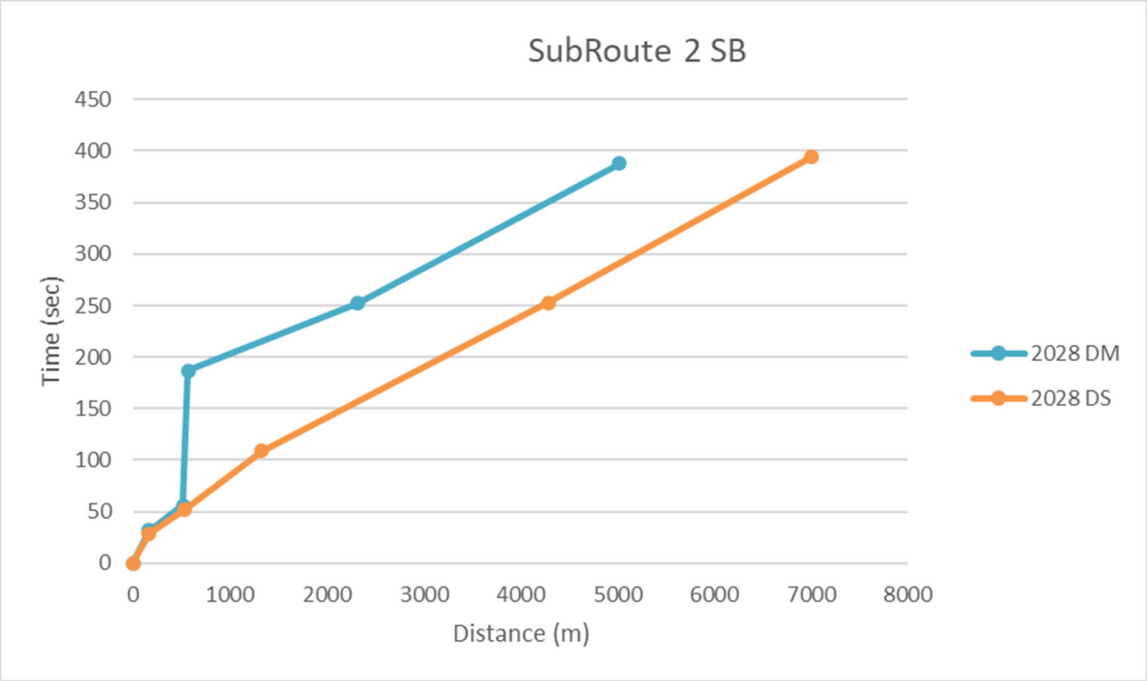
6.4.15. However, this additional distance travel time is counteracted when congestion is high such as the same route for the PM peak northbound shown in Figure 6-6.

Figure 6-6 Sub-Route 2 northbound time-distance graph (2028 PM)



6.4.16. Similarly, in the southbound direction, the travel times become much closer albeit the DS is still marginally longer (Figure 6-7).

Figure 6-7 Sub-Route 2 southbound time-distance graph (2028 PM)



6.4.17. Away from the A46, the A428 east-west through Binley sees minor increases in travel time. However, Clifford Bridge Road between Brinklow Road and the University Hospital Coventry access sees small decreases in travel time.

6.4.18. The travel times in 2043 see a similar pattern to 2028. However, Route 5 from the A46 north of Walsgrave to Clifford Bridge Road south now sees a decrease in travel time southbound in the PM peak and northbound in the AM and Inter peaks. In both cases, this is due to a higher increase in travel time between 2028 and 2043 for the DM than for the DS for these time periods and directions. For the southbound PM in the DM, travel time increases by 50% between 2028 and 2043 compared to 9% for the DS. Similarly, the AM and IP northbound travel times increase by 28% in the DM for the same period compared to 14% in the AM and 5% in the IP. This indicates that the Scheme has more ability to accommodate future traffic growth for these movements.

6.4.19. Route 2 from the A46 south to Clifford Bridge Road north in the DS still sees similar increases in travel time over the DM southbound of up to just under a minute in the AM and IP as would be expected as the increase in travel time is due to the increased distance rather than queuing at Walsgrave junction. However, northbound in both the AM and PM peaks see a reduction in travel time as the new layout avoids the congestion at the existing junction.

6.4.20. Due to the limited number of public transport services that utilise the A46 in this area, the Scheme is unlikely to have a significant impact on bus journey

times. However, as congestion and vehicle flows on local routes are predicted to decrease, a small positive impact is likely for local services.

6.4.21. Based on the routes detailed in the previous sections, speeds on key sections of the network have been calculated and disaggregated to a more detailed level and are presented in Table 6-12 and Table 6-13. Red cells indicate a decrease in speed and green an increase with the depth of colour indicating the magnitude of change.

Table 6-12 2028 Network speeds (mph)

Section	From	To	AM Peak			Inter Peak			PM Peak		
			DM	DS	DS-DM	DM	DS	DS-DM	DM	DS	DS-DM
A46 SB	A46 SB Merge	A46 Walsgrave Jn	16	46	29.5	37	52	14.9	24	50	26.3
	A46 Walsgrave Jn	A46 Binley	63	53	-9.8	63	58	-5.6	63	55	-7.8
	A46 Binley	A46 Tollbar End	46	42	-4.1	47	48	0.4	45	43	-1.9
A46 NB	A46 Tollbar End	A46 Binley	51	49	-2.5	55	55	0.5	51	43	-8.8
	A46 Binley	A46 Walsgrave Jn	26	58	31.8	53	58	5.3	11	53	41.4
	A46 Walsgrave Jn	A46 NB Diverge	52	50	-1.5	52	52	0.3	50	26	-23.7
B4082 WB	A46 Walsgrave Jn	B4082 East	25	34	9.4	25	35	9.9	25	32	7.3
	B4082 East	Clifford Bridge Rd	21	25	4.3	23	26	3.7	22	23	1.3
B4082 EB	Clifford Bridge Rd	B4082 East	38	36	-1.8	38	37	-0.2	33	36	2.9
	B4082 East	A46 Walsgrave Jn	2	36	34.0	4	36	32.2	1	33	32.5
Clifford Bridge Road NB	Brinklow Road	B4082	22	22	0.2	22	22	0.0	21	21	0.5
	B4082	Tesco	14	14	0.5	14	15	1.1	13	12	-0.4
	Tesco	Belgrave Road	15	17	1.3	16	17	1.4	16	16	0.0
	Belgrave Road	Hospital Access	14	14	0.0	18	18	0.6	18	18	0.0
Clifford Bridge Road SB	Hospital Access	Belgrave Road	18	19	1.0	18	19	0.7	16	17	1.3
	Belgrave Road	Tesco	16	17	1.2	17	18	0.9	14	14	0.8
	Tesco	B4082	12	13	0.4	13	14	0.9	11	12	1.0
	B4082	Brinklow Road	20	20	0.2	21	21	0.0	18	18	0.0
A428 Binley Road EB	Brinklow Rd	Herald Way	19	19	0.0	19	19	0.0	19	19	0.0
	Herald Way	Binley West	15	15	0.0	15	15	0.0	14	13	-0.8
	Binley West	Binley East	28	23	-4.7	28	28	0.0	23	23	0.0
	Binley East	Ferndale Rd	25	25	0.0	25	25	0.0	25	25	0.0
A428 Binley Road WB	Ferndale Rd	Binley East	22	22	-0.2	23	23	0.3	23	22	-0.5
	Binley East	Binley West	28	28	0.0	28	25	-2.8	25	28	2.8
	Binley West	Herald Way	16	16	-0.4	17	17	-0.5	17	17	-0.3
	Herald Way	Brinklow Rd	22	21	-0.3	21	22	0.3	21	21	0.0

Table 6-13 2043 Network speeds (mph)

Section	From	To	AM Peak			Inter Peak			PM Peak		
			DM	DS	DS-DM	DM	DS	DS-DM	DM	DS	DS-DM
A46 SB	A46 SB Merge	A46 Walsgrave Jn	16	44	28.5	30	51	20.9	17	46	29.1
	A46 Walsgrave Jn	A46 Binley	63	53	-10.5	63	57	-6.4	63	54	-9.2
	A46 Binley	A46 Tollbar End	45	40	-4.5	46	45	-1.0	44	40	-3.8
A46 NB	A46 Tollbar End	A46 Binley	48	42	-6.0	54	53	-1.0	48	39	-8.7
	A46 Binley	A46 Walsgrave Jn	16	55	39.0	25	57	32.4	10	51	41.4
	A46 Walsgrave Jn	A46 NB Diverge	51	42	-9.4	51	49	-2.4	50	22	-28.1
B4082 WB	A46 Walsgrave Jn	B4082 East	25	33	8.3	25	34	9.4	25	29	4.7
	B4082 East	Clifford Bridge Rd	22	24	2.5	22	26	4.3	23	20	-3.2
B4082 EB	Clifford Bridge Rd	B4082 East	38	36	-1.8	36	36	-0.1	32	34	2.7
	B4082 East	A46 Walsgrave Jn	1	35	33.6	1	35	33.2	1	33	32.7
Clifford Bridge Road NB	Brinklow Road	B4082	22	22	0.0	22	22	0.0	21	21	0.7
	B4082	Tesco	14	14	0.5	14	14	0.5	12	10	-2.6
	Tesco	Belgrave Road	15	15	0.2	16	17	0.8	15	14	-1.0
	Belgrave Road	Hospital Access	13	14	0.2	18	18	0.6	17	17	-0.3
Clifford Bridge Road SB	Hospital Access	Belgrave Road	18	18	0.6	18	19	1.0	15	16	1.4
	Belgrave Road	Tesco	16	16	0.3	17	17	0.6	13	14	0.9
	Tesco	B4082	12	12	0.4	12	13	0.9	10	11	0.9
	B4082	Brinklow Road	20	20	0.2	20	20	0.0	18	18	0.0
A428 Binley Road EB	Brinklow Rd	Herald Way	19	19	0.0	19	19	0.2	19	19	0.0
	Herald Way	Binley West	15	15	0.0	15	14	-0.4	14	13	-0.6
	Binley West	Binley East	23	28	4.7	23	23	0.0	23	23	0.0
	Binley East	Ferndale Rd	25	25	0.0	25	25	0.0	25	25	0.0
A428 Binley Road WB	Ferndale Rd	Binley East	22	22	-0.2	23	23	0.0	23	23	0.0
	Binley East	Binley West	28	25	-2.8	28	25	-2.8	28	28	0.0
	Binley West	Herald Way	16	16	-0.2	17	17	-0.5	17	17	0.0
	Herald Way	Brinklow Rd	21	22	0.3	22	22	0.0	17	46	0.0

6.4.22. When comparing DM to DS in 2028 and 2043 a significant increase in speed is seen on all approaches to A46 Walsgrave junction in all peak periods indicating a reduction in congestion. This is despite a revised lower speed limit introduced as part of the Scheme. However, decreases in speed is seen on the A46 links from Walsgrave to Tollbar Island southbound and from Tollbar Island to Binley northbound. This is due to the increase traffic on these links slowing the overall speed.

6.4.23. Very little change is seen on Clifford Bridge Road or for most sections of Binley Road although the approaches to the A46 Binley junction do decrease both eastbound and westbound in some scenarios likely due to rerouting.

6.4.24. The Core scenario forecast traffic flows for the A46 Walsgrave Scheme area are shown in Table 6-14 at annual average daily traffic (AADT) level for each forecast scenario.

Table 6-14 AADT – A46 Walsgrave

Link	Location relative to Walsgrave	Direction	2028			2043		
			DM	DS	DS-DM	DM	DS	DS-DM
A46	North	Southbound	25,914	30,347	4,433	27,719	34,183	6,464
A46	North	Northbound	29,165	32,660	3,495	29,705	38,088	8,383
A46	South	Southbound	26,076	28,459	2,383	26,395	32,167	5,772
A46	South	Northbound	29,188	31,186	1,998	29,319	36,344	7,025
B4082	West	Eastbound	7,731	4,900	-2,831	8,113	6,368	-1,745
B4082	West	Westbound	8,509	5,296	-3,213	8,307	6,622	-1,685

6.4.25. When looking at growth between 2028 and 2043, the DM sees an increase in the AADT flows on the A46 North of the Walsgrave Junction of 7% travelling southbound and 2% northbound.

6.4.26. On the A46 south of the Walsgrave Junction, the AADT flows do not increase significantly in the DM between 2028 and 2043 with only a 1% increase southbound and 0% northbound indicating a constraint at the junction which is restricting traffic.

6.4.27. On the B4082 West of the Walsgrave Junction, the AADT flows increase by 5% eastbound i.e., approaching the junction but decrease -2% westbound between 2028 and 2043. Again, this indicates the flows are constrained here.

6.4.28. In the Do Something scenarios, AADT flows increase on the A46 however flows decrease on the B4082 compared to the Do Minimum. For example, on the

southbound A46 north of Walsgrave in 2043, the AADT flows increase by 23% from Do Minimum to Do Something. Whereas on the Eastbound B4082, AADT flows decrease by -22% Do Minimum to Do Something.

6.5. Sensitivity Testing

6.5.1. The following tables provide a comparison of the High Economy and Low Economy models.

6.5.2. Table 6-15 to Table 6-18 set out the link flow differences at the key locations in the local area for DM and DS at the locations shown earlier in Figure 6-3.

6.5.3. Both the High and Low Economy scenarios generally follow the same pattern as the Core with increases on the A46 and decreases on the majority of local roads. Of note is the Low Economy IP flows in 2028 which again show the reductions in flow in the Scheme area as the increased travel distance for access to/from the B4082 means other routes become more competitive. This pattern reduces in 2043.

Table 6-15 2028 Local area modelled flow differences in the High Economy scenario (PCUs)

2028		AM Peak			Inter Peak			PM Peak		
Link	**Direction**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**
A46 North of Walsgrave	NB	2,479	3,053	574	2,548	2,651	103	2,727	3,733	1,006
	SB	2,669	3,628	958	2,349	2,439	89	2,516	2,989	473
A46 South of Walsgrave	NB	2,606	3,017	410	2,658	2,474	-184	2,690	3,561	871
	SB	2,240	3,161	922	2,232	2,280	49	2,244	2,843	599
B4082 west of A46 Walsgrave	EB	595	356	-239	506	350	-156	908	376	-532
	WB	797	341	-456	697	320	-377	634	643	10
A428 west of A46 Binley	EB	757	855	98	892	880	-12	880	1,092	212
	WB	1,048	1,140	92	785	900	115	808	835	27
A428 east of A46 Binley	EB	510	560	50	552	546	-7	622	595	-27
	WB	811	855	44	615	605	-11	657	720	62
A46 South of Binley	NB	2,995	3,156	160	2,633	2,517	-117	3,079	3,430	351
	SB	2,638	3,309	671	2,377	2,361	-15	2,740	3,093	353
Clifford Bridge Rd north of B4082	NB	839	516	-323	896	663	-233	1,008	1,009	1
	SB	854	669	-185	776	616	-159	1,086	762	-324
Clifford Bridge Rd south of B4082	NB	703	622	-81	567	624	57	1,154	850	-304
	SB	921	760	-161	638	547	-91	957	870	-88
A428 Brandon Rd east of Brinklow Rd	EB	1,177	1,100	-76	821	780	-41	926	809	-117
	WB	717	665	-52	813	860	47	1,089	975	-114

Table 6-16 2043 Local area modelled flow differences in the High Economy scenario (PCUs)

2043		AM Peak			Inter Peak			PM Peak		
Link	**Direction**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**
A46 North of Walsgrave	NB	2,520	3,567	1,046	2,510	3,209	699	2,755	3,706	951
	SB	2,715	3,528	813	2,520	2,831	311	2,668	3,422	754
A46 South of Walsgrave	NB	2,587	3,427	840	2,478	3,007	530	2,756	3,745	989
	SB	2,235	3,276	1,041	2,236	2,630	395	2,240	3,135	895
B4082 west of A46 Walsgrave	EB	605	506	-98	635	429	-206	979	463	-516
	WB	689	410	-279	664	417	-247	640	857	218
A428 west of A46 Binley	EB	766	832	66	801	915	114	907	1,070	164
	WB	993	1,033	39	843	909	66	934	850	-84
A428 east of A46 Binley	EB	427	444	17	475	466	-9	482	519	38
	WB	750	845	95	545	549	4	593	593	0
A46 South of Binley	NB	3,079	3,461	383	2,767	3,057	290	3,289	3,691	401
	SB	2,823	3,511	688	2,552	2,769	217	2,858	3,375	517
Clifford Bridge Rd north of B4082	NB	789	585	-204	850	731	-119	1,081	1,199	118
	SB	885	805	-80	826	676	-150	1,078	783	-295
Clifford Bridge Rd south of B4082	NB	762	644	-118	693	626	-68	1,200	875	-325
	SB	943	767	-176	700	560	-140	859	853	-5
A428 Brandon Rd east of Brinklow Rd	EB	1,217	1,085	-131	862	759	-103	868	823	-45
	WB	769	659	-110	895	848	-46	1,137	968	-169

Table 6-17 2028 Local area modelled flow differences in the Low Economy scenario (PCUs)

2028		AM Peak			Inter Peak			PM Peak		
Link	**Direction**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**
A46 North of Walsgrave	NB	2,415	2,730	315	2,434	2,450	16	2,720	3,719	998
	SB	2,633	3,367	734	2,255	2,298	43	2,475	2,819	344
A46 South of Walsgrave	NB	2,691	2,714	23	2,541	2,313	-228	2,699	3,583	884
	SB	2,243	3,145	902	2,237	2,175	-62	2,245	2,686	441
B4082 west of A46 Walsgrave	EB	547	295	-253	565	345	-220	907	601	-306
	WB	930	501	-429	662	331	-331	650	599	-51
A428 west of A46 Binley	EB	805	804	-1	891	873	-18	927	1,150	223
	WB	1,038	1,215	177	809	892	84	765	807	42
A428 east of A46 Binley	EB	536	604	68	569	556	-13	638	598	-39
	WB	825	821	-3	617	605	-12	656	735	79
A46 South of Binley	NB	3,013	3,037	23	2,532	2,391	-141	3,032	3,402	369
	SB	2,620	3,273	653	2,359	2,284	-75	2,759	2,984	225
Clifford Bridge Rd north of B4082	NB	993	834	-159	908	729	-179	1,040	1,056	16
	SB	883	731	-152	824	670	-154	1,162	1,091	-71
Clifford Bridge Rd south of B4082	NB	670	666	-4	604	641	38	1,139	906	-233
	SB	944	769	-175	618	568	-49	1,004	939	-65
A428 Brandon Rd east of Brinklow Rd	EB	1,256	1,153	-103	841	816	-25	941	853	-87
	WB	671	727	55	843	905	62	1,106	994	-112

Table 6-18 2043 Local area modelled flow differences in the Low Economy scenario (PCUs)

2043		AM Peak			Inter Peak			PM Peak		
Link	**Direction**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**	**DM**	**DS**	**DS-DM**
A46 North of Walsgrave	NB	2,436	3,002	567	2,501	2,804	303	2,714	3,768	1,054
	SB	2,629	3,450	821	2,388	2,549	161	2,531	3,115	585
A46 South of Walsgrave	NB	2,717	2,958	241	2,640	2,611	-28	2,732	3,680	948
	SB	2,244	3,238	994	2,239	2,410	172	2,246	2,913	667
B4082 west of A46 Walsgrave	EB	582	401	-181	564	437	-127	918	657	-262
	WB	915	568	-347	758	383	-375	633	771	138
A428 west of A46 Binley	EB	812	787	-25	918	911	-7	989	1,182	193
	WB	1,076	1,207	132	756	919	163	827	830	3
A428 east of A46 Binley	EB	443	501	58	507	503	-4	552	551	-1
	WB	789	820	31	567	562	-5	555	624	68
A46 South of Binley	NB	3,122	3,238	116	2,684	2,702	18	3,157	3,551	394
	SB	2,732	3,417	686	2,505	2,552	47	2,837	3,209	372
Clifford Bridge Rd north of B4082	NB	1,010	881	-129	944	772	-172	1,058	1,215	158
	SB	946	802	-144	862	724	-138	1,195	1,152	-43
Clifford Bridge Rd south of B4082	NB	670	705	35	596	686	90	1,187	928	-258
	SB	940	794	-146	708	584	-124	1,039	979	-60
A428 Brandon Rd east of Brinklow Rd	EB	1,239	1,123	-116	892	792	-100	950	864	-86
	WB	708	725	18	851	898	47	1,157	1,003	-154

6.5.4. The differences in travel times over the same journey time routes as set out for the Core scenario are presented in Table 6-19 to Table 6-22. The travel times are averages for all vehicle types over the modelled average peak hour.

6.5.5. The journey times over the five sub routes showed very similar patterns to the Core assessment with the greatest travel time savings occurring on the A46 in both directions and increases on routes turning to/from the B4082 due to the increased travel distance unless congestion occurs, at which point, the revised layout leads to travel time savings.

6.5.6. Similarly, network speeds showed very similar patterns to the Core scenario with the greatest increase in speed on each of the approaches to the A46 Walsgrave junction and decreases in speed on the A46 exits from the junction which is likely due to a combination of the lower speed limit introduced with the Scheme and the increases traffic on the A46.

Table 6-19 2028 Travel time differences in minutes: seconds (High Economy scenario)

	2028		AM Peak			Inter Peak			PM Peak		
	From	To	DM	DS	DS-DM	DM	DS	DS-DM	DM	DS	DS-DM
1	A46 North of Walsgrave	A46 South of Binley	08:45	05:56	-02:49	05:30	05:07	-00:23	06:56	05:28	-01:28
	A46 South of Binley	A46 North of Walsgrave	06:35	05:19	-01:16	05:01	04:53	-00:08	09:47	08:03	-01:44
2	A46 South of Binley	Clifford Bridge Rd north of B4082	06:08	06:04	-00:04	04:22	05:45	01:23	09:18	06:52	-02:26
	Clifford Bridge Rd north of B4082	A46 South of Binley	05:13	06:51	01:38	05:04	06:10	01:06	06:29	06:31	00:02
3	A428 west of A46 Binley	A428 east of A46 Binley	04:15	04:17	00:02	04:16	04:16	00:00	04:18	04:23	00:05
	A428 east of A46 Binley	A428 west of A46 Binley	04:14	04:17	00:03	04:05	04:07	00:02	04:08	04:09	00:01
4	Clifford Bridge Road / Brinklow Road	Clifford Bridge Road / Hospital Access	04:06	03:39	-00:27	03:52	03:41	-00:11	04:00	03:55	-00:05
	Clifford Bridge Road / Hospital Access	Clifford Bridge Road / Brinklow Road	04:00	03:48	-00:12	03:54	03:46	-00:08	04:31	04:07	-00:24
5	A46 North of Walsgrave	Clifford Bridge Rd south of B4082	03:46	03:26	-00:20	02:47	03:13	00:26	03:45	03:32	-00:13
	Clifford Bridge Rd south of B4082	A46 North of Walsgrave	03:36	03:05	-00:31	03:30	02:57	-00:33	04:56	05:15	00:19

Table 6-20 2043 travel timed differences in minutes: seconds (High Economy scenario)

	2043		AM Peak			Inter Peak			PM Peak		
	From	To	DM	DS	DS-DM	DM	DS	DS-DM	DM	DS	DS-DM
1	A46 North of Walsgrave	A46 South of Binley	08:52	06:10	-02:42	06:13	05:18	-00:55	08:22	05:52	-02:30
	A46 South of Binley	A46 North of Walsgrave	08:37	06:21	-02:16	06:55	05:37	-01:18	11:02	09:05	-01:57
2	A46 South of Binley	Clifford Bridge Rd north of B4082	08:08	06:32	-01:36	06:25	06:03	-00:22	10:34	07:39	-02:55
	Clifford Bridge Rd north of B4082	A46 South of Binley	06:35	07:12	00:37	05:23	06:23	01:00	07:06	06:54	-00:12
3	A428 west of A46 Binley	A428 east of A46 Binley	04:16	04:16	00:00	04:14	04:16	00:02	04:19	04:22	00:03
	A428 east of A46 Binley	A428 west of A46 Binley	04:13	04:14	00:01	04:05	04:06	00:01	04:09	04:07	-00:02
4	Clifford Bridge Road / Brinklow Road	Clifford Bridge Road / Hospital Access	04:00	03:41	-00:19	03:49	03:42	-00:07	04:05	04:06	00:01
	Clifford Bridge Road / Hospital Access	Clifford Bridge Road / Brinklow Road	04:00	03:54	-00:06	03:55	03:47	-00:08	04:28	04:07	-00:21
5	A46 North of Walsgrave	Clifford Bridge Rd south of B4082	03:30	03:24	-00:06	03:09	03:19	00:10	05:30	03:51	-01:39
	Clifford Bridge Rd south of B4082	A46 North of Walsgrave	04:57	03:42	-01:15	03:51	03:30	-00:21	05:33	05:55	00:22

Table 6-21 2028 Travel time differences in minutes: seconds (Low Economy scenario)

	2028		AM Peak			Inter Peak			PM Peak		
	From	To	DM	DS	DS-DM	DM	DS	DS-DM	DM	DS	DS-DM
1	A46 North of Walsgrave	A46 South of Binley	08:44	05:50	-02:54	05:23	05:05	-00:18	06:31	05:23	-01:08
	A46 South of Binley	A46 North of Walsgrave	05:43	05:02	-00:41	04:50	04:50	00:00	09:34	07:28	-02:06
2	A46 South of Binley	Clifford Bridge Rd north of B4082	05:12	05:52	00:40	04:18	05:35	01:17	09:04	06:36	-02:28
	Clifford Bridge Rd north of B4082	A46 South of Binley	05:14	06:46	01:32	04:46	06:06	01:20	06:28	06:33	00:05
3	A428 west of A46 Binley	A428 east of A46 Binley	04:17	04:17	00:00	04:16	04:16	00:00	04:20	04:25	00:05
	A428 east of A46 Binley	A428 west of A46 Binley	04:15	04:18	00:03	04:06	04:07	00:01	04:07	04:09	00:02
4	Clifford Bridge Road / Brinklow Road	Clifford Bridge Road / Hospital Access	04:17	04:09	-00:08	03:54	03:45	-00:09	04:01	03:57	-00:04
	Clifford Bridge Road / Hospital Access	Clifford Bridge Road / Brinklow Road	04:02	03:52	-00:10	03:57	03:50	-00:07	04:38	04:27	-00:11
5	A46 North of Walsgrave	Clifford Bridge Rd south of B4082	03:25	03:12	-00:13	02:42	03:02	00:20	03:19	03:13	-00:06
	Clifford Bridge Rd south of B4082	A46 North of Walsgrave	03:23	02:55	-00:28	02:58	02:53	-00:05	04:53	04:45	-00:08

Table 6-22 2043 travel timed differences in minutes: seconds (Low Economy scenario)

	2043		AM Peak			Inter Peak			PM Peak		
	From	To	DM	DS	DS-DM	DM	DS	DS-DM	DM	DS	DS-DM
1	A46 North of Walsgrave	A46 South of Binley	08:52	06:02	-02:50	05:52	05:11	-00:41	07:22	05:32	-01:50
	A46 South of Binley	A46 North of Walsgrave	06:29	05:20	-01:09	05:26	04:56	-00:30	10:19	08:10	-02:09
2	A46 South of Binley	Clifford Bridge Rd north of B4082	06:00	06:10	00:10	04:49	05:41	00:52	09:50	07:02	-02:48
	Clifford Bridge Rd north of B4082	A46 South of Binley	05:39	07:00	01:21	05:16	06:14	00:58	06:56	06:44	-00:12
3	A428 west of A46 Binley	A428 east of A46 Binley	04:17	04:16	-00:01	04:17	04:17	00:00	04:22	04:26	00:04
	A428 east of A46 Binley	A428 west of A46 Binley	04:15	04:18	00:03	04:04	04:07	00:03	04:06	04:07	00:01
4	Clifford Bridge Road / Brinklow Road	Clifford Bridge Road / Hospital Access	04:18	04:12	-00:06	03:55	03:47	-00:08	04:03	04:07	00:04
	Clifford Bridge Road / Hospital Access	Clifford Bridge Road / Brinklow Road	04:05	03:56	-00:09	03:59	03:52	-00:07	04:43	04:31	-00:12
5	A46 North of Walsgrave	Clifford Bridge Rd south of B4082	03:33	03:14	-00:19	02:51	03:04	00:13	04:06	03:23	-00:43
	Clifford Bridge Rd south of B4082	A46 North of Walsgrave	03:45	03:00	-00:45	03:44	02:57	-00:47	05:19	05:13	-00:06

6.5.7. The High and Low scenario forecast traffic flows for the A46 Walsgrave Scheme area are shown in Table 6-23 and Table 6-24 at AADT level for each forecast scenario. As for the Core scenario, these show large increases on the A46 between DM and DS but relatively little change on the B4082.

Table 6-23 High Economy AADT – A46 Walsgrave

Link	Location relative to Walsgrave	Direction	2028			2043		
			DM	DS	DS-DM	DM	DS	DS-DM
A46	North	Southbound	28273	34570	6297	30255	40046	9791
A46	North	Northbound	29883	32379	2495	30031	36064	6033
A46	South	Southbound	26073	29680	3607	26321	33259	6938
A46	South	Northbound	31127	32733	1606	29870	38273	8403
B4082	West	Eastbound	6969	7000	31	9011	8998	-13
B4082	West	Westbound	10684	10783	99	12666	12628	-38

Table 6-24 Low Economy AADT – A46 Walsgrave

Link	Location relative to Walsgrave	Direction	2028			2043		
			DM	DS	DS-DM	DM	DS	DS-DM
A46	North	Southbound	27277	32183	4907	28441	36043	7602
A46	North	Northbound	28945	30142	1196	29756	33039	3283
A46	South	Southbound	26108	28386	2279	26163	31047	4883
A46	South	Northbound	30559	30808	249	31704	34255	2551
B4082	West	Eastbound	5802	5816	15	6258	6266	9
B4082	West	Westbound	10754	10776	22	12162	12129	-33

6.5.8. As noted in Section 4.11 above, an additional High Economy test scenario was completed without the provision of the University Hospital Coventry link open to staff traffic. In this scenario, to allow direct comparison to be made, the University Hospital Coventry link is still present in the DS but is only useable by 'Blue Light Vehicles' and public transport. As the former are not specifically modelled and the latter do not route along this link, this effectively leaves the link in place but with no traffic flow. Table 6-25 gives link flow differences in the local area in 2043 for the links shown in Figure 6-3.

Table 6-25 University Hospital Coventry link local network 2043 link flow differences (PCU)

2043		AM			IP			PM		
Link	Direction	No Link	With Link	Diff	No Link	With Link	Diff	No Link	With Link	Diff
A46 North of Walsgrave	NB	3,550	3,567	17	3,184	3,209	25	3,712	3,706	-6
	SB	3,420	3,528	108	2,797	2,831	34	3,420	3,422	2
A46 South of Walsgrave	NB	3,334	3,427	92	2,995	3,007	13	3,731	3,745	14
	SB	3,295	3,276	-19	2,613	2,630	18	3,105	3,135	30
B4082 west of A46 Walsgrave	EB	509	506	-3	436	429	-7	579	463	-116
	WB	487	410	-78	429	417	-12	867	857	-9
A428 west of A46 Binley	EB	803	832	28	906	915	9	1,078	1,070	-8
	WB	1,048	1,033	-16	907	909	2	856	850	-7
A428 east of A46 Binley	EB	451	444	-7	466	466	0	514	519	5
	WB	829	845	16	549	549	0	593	593	0
A46 South of Binley	NB	3,436	3,461	25	3,057	3,057	0	3,681	3,691	9
	SB	3,530	3,511	-20	2,756	2,769	13	3,356	3,375	19
Clifford Bridge Rd north of B4082	NB	763	585	-177	766	731	-36	1,267	1,199	-68
	SB	834	805	-30	701	676	-25	966	783	-183
Clifford Bridge Rd south of B4082	NB	701	644	-57	639	626	-13	863	875	12
	SB	751	767	16	566	560	-7	850	853	3

6.5.9. It can be seen that, in each of the three peak periods, with the inclusion of the University Hospital Coventry link for staff access traffic is generally rerouted away from Clifford Bridge Road, Ansty Road and Hinckley Road and onto the A46 to access the University Hospital Coventry at the A46 Walsgrave junction.

6.6. Operational Modelling Assessment

6.6.1. A VISSIM microsimulation model was used to assess the operation of the Scheme option in the opening and design years. This varies from the strategic model as it looks at the detailed progression of vehicles through the network rather than average hourly data and incorporates interactions between the vehicles and an element of randomness in their movements to simulate more real world interactions. It is useful to identify trends in traffic behaviour on a small scale that an hourly model cannot such as the build up of traffic queues due to queuing back through subsequent junctions. In this case, the operational model has been used to identify any potential for queuing back onto the A46 from the surrounding road network.

6.6.2. Multiple model runs are carried out due to the variability between each assignment and then aggregate statistics can be assessed to understand the trends in behaviour.

6.6.3. The overall traffic demand used in the operational modelling is extracted from the DM and DS strategic model. As such, the volume of traffic in the DS operational model is greater than the DM as more trips use the A46 in the strategic model DS.

6.6.4. Network performance statistics, shown in Table 6-26, give an overview of the impact on all trips within the network and so includes the impact where an improvement for some movements occurs to the detriment of others.

6.6.5. Latent demand in the traffic that is held back outside of the network as it is unable to enter the network as a link is already full of vehicles due to the level of congestion/queuing on the link. Latent delay is the time spent waiting to get on the network by this latent demand. It is a useful indicator here of the level of congestion in the network. The higher the latent demand, the more congested the network must be.

Table 6-26 VISSIM Network summary statistics

	Scenario	2018 Base	2028 DM	2028 DS	2028 % Diff	DS-DM	2043 DM	2043 DS	2043 % Diff	DS-DM
AM Peak	Total Demand (incl. latent demand)	13,078	13,468	14,292	6%	823	14,374	15,334	7%	960
	Latent Demand	2	2	1	23%	0	1	2	119%	1
	Average Delay s/veh	181	91	66	-28%	-26	118	84	-29%	-35
	Average Delay (incl. latent delay) s/veh	219	211	74	-65%	-138	118	85	-29%	-34
PM Peak	Total Demand (incl. latent demand)	13,668	14,566	15,049	3%	483	16,038	16,641	4%	603
	Latent Demand	2	1	1	81%	1	253	191	-25%	-63
	Average Delay s/veh	219	211	73	-65%	-138	273	131	-52%	-141
	Average Delay (incl. latent delay) s/veh	219	211	74	-65%	-138	288	149	-48%	-140

6.6.6. As can be seen in the above table, the average delay decreases in 2028 and 2043 for both AM and PM peaks with the introduction of the Scheme. This is despite more vehicles being present in the network in the DS scenarios for both

peaks and years. This indicates that the introduction of the Scheme provides a more efficient network in this local area.

6.6.7. In general, latent demand is very low with the exception of the 2043 DM and DS PM. It was seen that this latent demand in 2043 DM PM consisted of vehicles trying to access the network from the A46 southbound joining at the northern extents of the network from the direction of M6 J2. This is due to queuing from the southbound approach to A46 Walsgrave Junction extending back past the merge point as shown on Figure 6-11. This queuing is removed in the DS scenario and hence there is reduced latent demand. However, in the DS scenario, latent demand is instead formed predominantly on Willenhall Lane. This is due to queuing on Brandon Road and also causes latent demand on other routes joining the network in this area.

6.6.8. Figure 6-8 to Figure 6-11 show the average speeds on the network across the peak hours. The green colours show speeds greater than 30mph in varying degrees as shown in the legends. Where speeds are less than 30mph yellow, orange and red are used to indicate increasing levels of congestion and queuing.

Figure 6-8 Average peak hour speeds - 2028 AM Peak DM vs DS

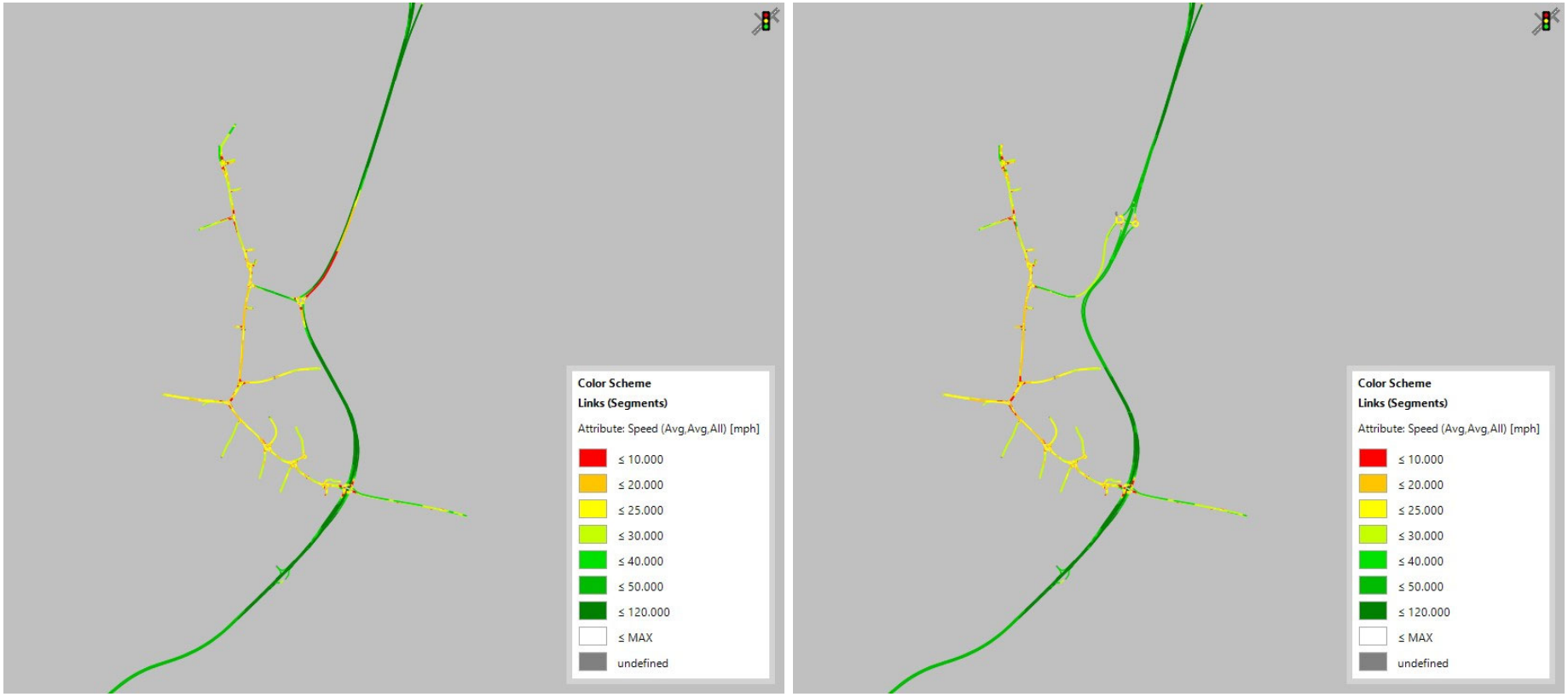
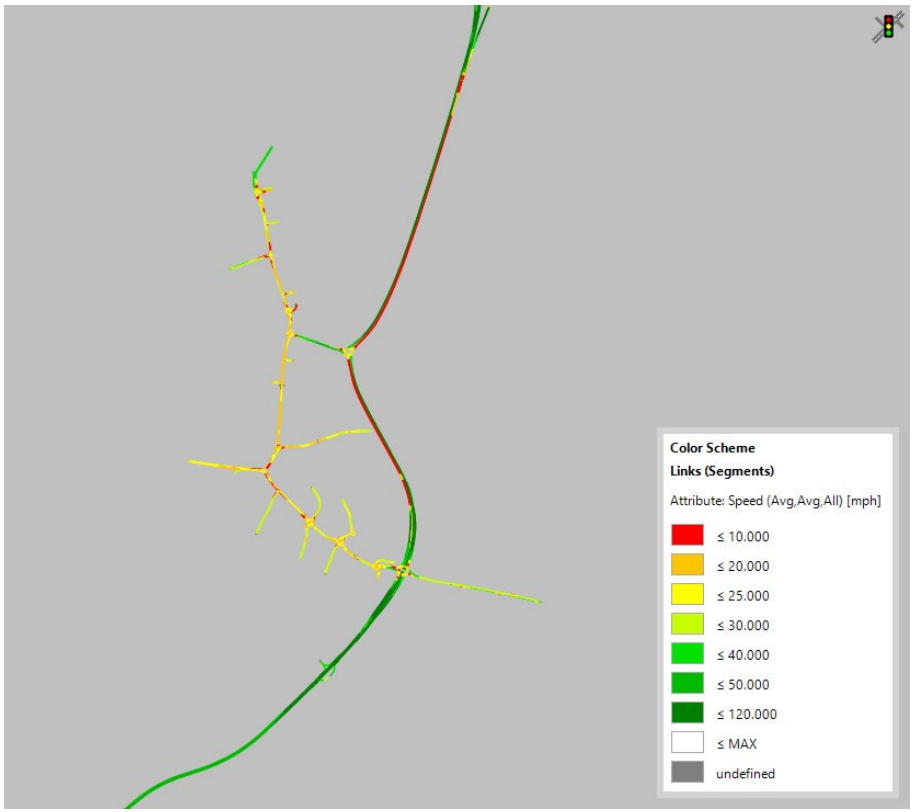


Figure 6-9 Average peak hour speeds – 2028 PM Peak DM vs DS



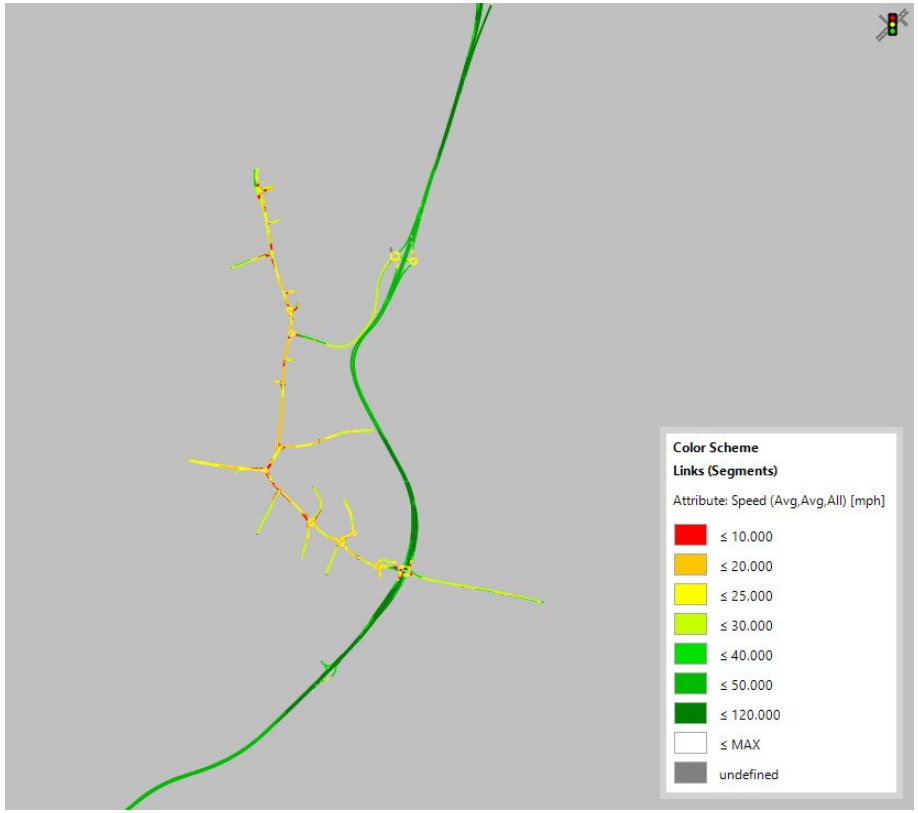
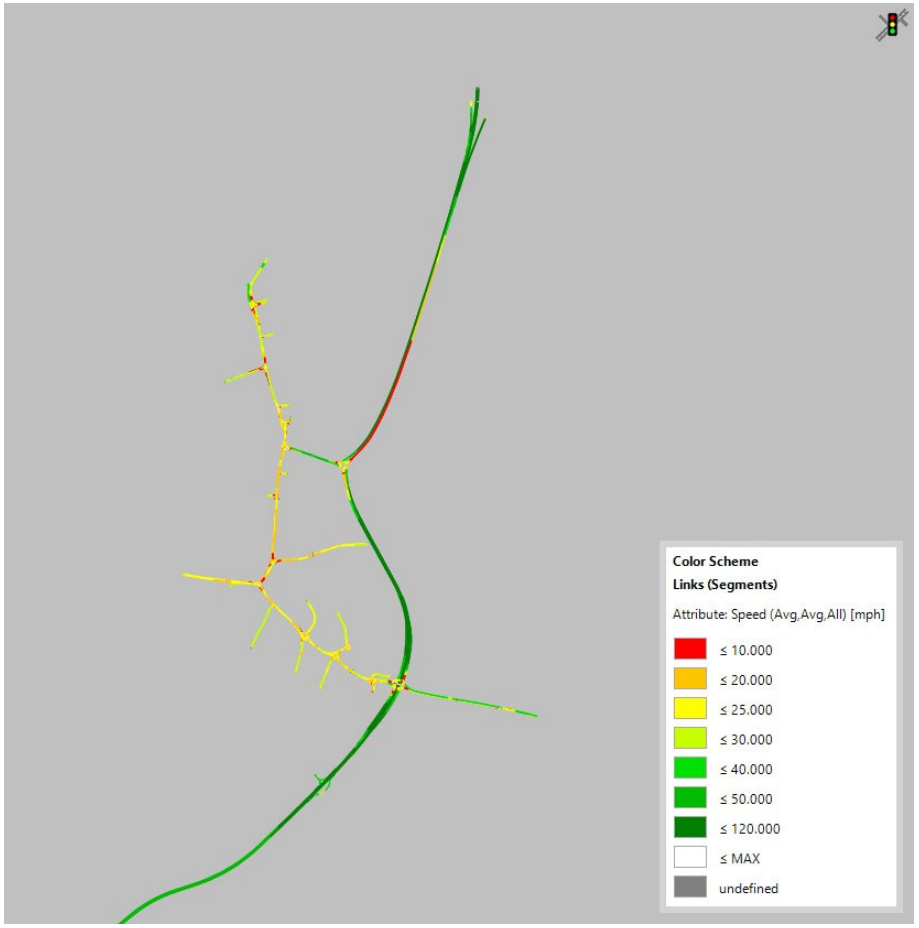


Figure 6-10 Average peak hour speeds – 2043 AM Peak DM vs DS



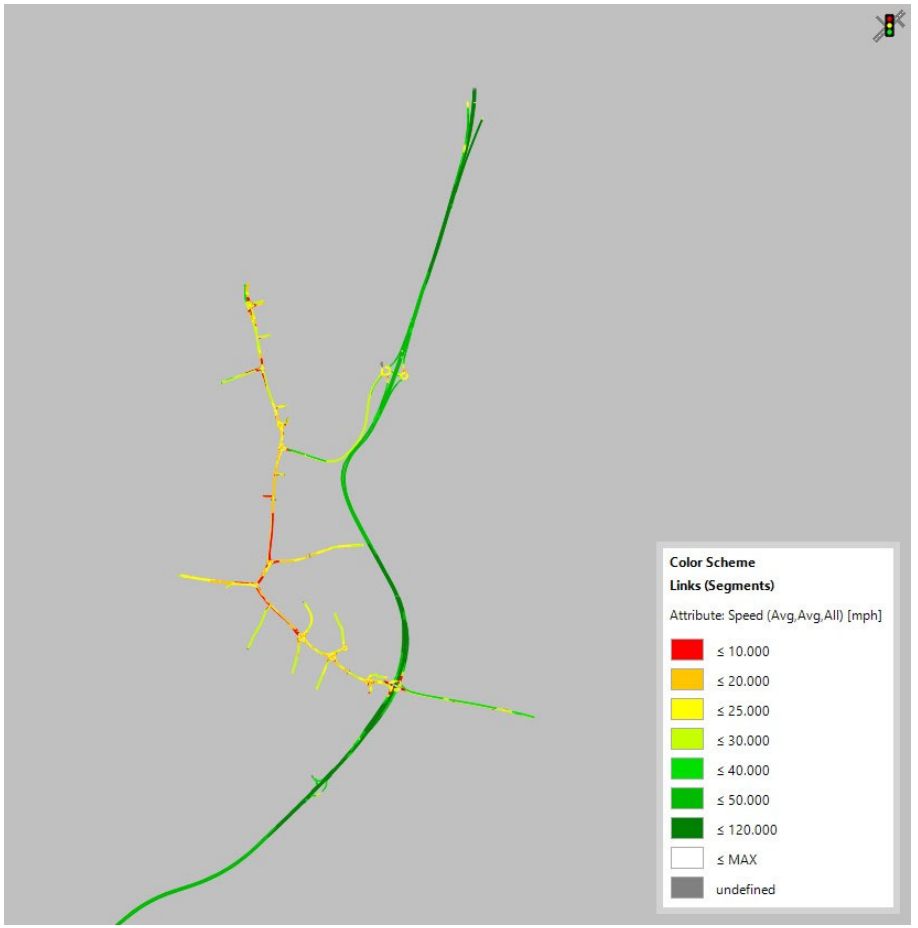
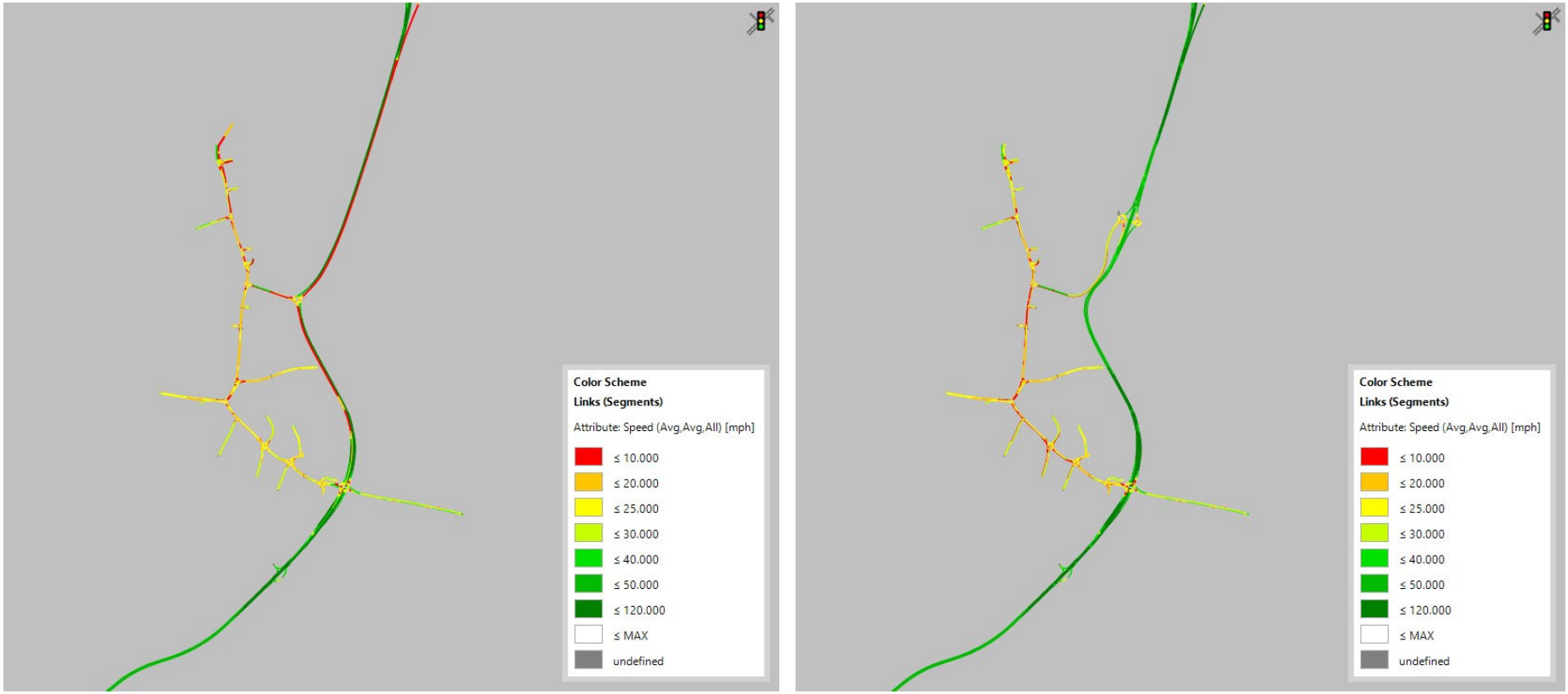


Figure 6-11 Average peak hour speeds – 2043 PM Peak DM vs DS



6.6.9. In the 2028 DM AM peak there are queues approaching A46 Walsgrave southbound. The southbound queue extends for over half a kilometre back towards to the A46/M69 merge. A similar queue is seen in 2043 but this extends further along the A46.

6.6.10. In the 2028 DM PM peak there is queuing in both directions on the A46 from the A46/M69 merge and from A46 Binley. A similar level of queuing is seen in 2043. However, the southbound queue exceeds the extents of the networks as indicated by the latent demand in Table 6-26.

6.6.11. In the DM scenarios, it is likely that the extent of the queuing seen on the B4082 approaching Walsgrave is being under-represented due to the variability of queues on this approach. During peak times, particularly the PM peak, the queue here can fluctuate to a much large level than average conditions as illustrated on Figure 6-12. This is likely due to large, short term increases in traffic. An example would be the end of a shift pattern at the hospital releasing an influx of traffic into the network in a short burst.

6.6.12. This fluctuation in queues can be difficult to replicate from average traffic flows without suitable observed data, and, as such, this was not fully represented in the base model brought forward from the option selection stage Base model and could not be incorporated at this stage due to the availability of base year observed data. As such, any benefits from removal of this queue are likely to be under-represented in the DS modelling and hence the improvements in queue reductions through implementation of the Scheme are likely to exceed the results presented here.

Figure 6-12 2024 PM peak typical traffic conditions at A46 Walsgrave

6.6.13. The DS scenarios remove queuing approaching A46 Walsgrave in all cases. Average speeds of throughflow traffic at Walsgrave are around 50mph which indicates travelling at/approaching the speed limit.

6.6.14. However, average speeds on the B4082 approaching Clifford Bridge Road are around 30mph, against a 40mph speed limit, showing slower moving traffic. However, queues are not seen to extend to the Scheme junction in either year or peak.

6.6.15. Additionally, the DS scenarios increase queueing on Brandon Road and Brinklow Road. This is seen on Clifford Bridge Road and Brandon Road approaching Brinklow Road in the 2043 DS AM and PM. This is partly due to increased demand for trips in this area in the DS as the DS matrices are higher, leading to increased congestion. However, the likely more significant cause is that traffic previously held back at A46 Walsgrave Junction in the DM can now reach this area in the DS within the peak period. For example, vehicles wishing to travel from the A46 north, near Ansty Park, to the A428 Binley Road in the west of the model would previously have been 'stuck' in a queue at the A46 Walsgrave junction. With the introduction of the Scheme, these vehicles would now be released to continue their journey.

6.6.16. A reduction in queuing is seen on Clifford Bridge Road to the north of the network between the junction with the B4082 and the hospital access.

6.6.17. Journey time data has been collected and analysed for the routes shown on Figure 5-1 and used in base model validation. The travel time results are given in Table 6-27 and Table 6-28 for the AM and PM peaks for each modelled year and scenario.

Table 6-27 VISSIM travel time results (minutes: seconds) - AM Peak

Route	1NB	1SB	2NB	2SB	3EB	3WB	4NB	4SB	5NB	5SB
2018 Base	7:35	15:27	10:17	12:30	4:55	4:49	10:23	9:14	5:08	9:58
2028 Do Minimum	5:55	8:13	7:19	6:06	4:37	4:26	9:18	8:29	5:16	8:01
2028 DM - 2018 Base	-1:40	-7:14	-2:58	-6:23	-0:19	-0:24	-1:05	-0:45	0:08	-1:56
2028 Do Something	5:48	5:37	9:03	8:14	5:03	4:49	9:33	9:02	6:00	6:53
2028 DS - DM	-0:07	-2:36	1:44	2:08	0:26	0:23	0:14	0:33	0:44	-1:08
2043 Do Minimum	5:57	10:48	7:21	6:26	4:43	4:27	9:13	8:54	5:27	10:49
2043 Do Something	6:00	5:38	9:18	8:25	5:31	6:35	11:29	9:60	6:25	7:41
2043 DS - DM	0:03	-5:10	1:56	1:59	0:49	2:08	2:17	1:06	0:58	-3:08

Table 6-28 VISSIM travel time results (minutes: seconds) - PM Peak

Route	1NB	1SB	2NB	2SB	3EB	3WB	4NB	4SB	5NB	5SB
2018 Base	13:25	12:23	14:44	13:35	5:10	5:47	10:41	11:04	5:41	6:50
2028 Do Minimum	10:28	14:52	11:51	6:60	5:07	4:53	10:03	9:08	6:10	14:39
2028 DM - 2018 Base	-2:58	2:29	-2:53	-6:35	-0:03	-0:53	-0:38	-1:57	0:29	7:49
2028 Do Something	5:56	5:31	9:26	8:40	5:10	5:05	10:20	9:02	6:51	6:59
2028 DS - DM	-4:32	-9:21	-2:25	1:40	0:03	0:12	0:17	-0:05	0:41	-7:40
2043 Do Minimum	10:49	17:59	14:60	9:23	5:04	4:26	9:52	11:27	6:28	20:34
2043 Do Something	5:60	5:36	17:16	8:52	5:28	8:23	15:42	9:19	8:31	13:29
2043 DS - DM	-4:49	-12:23	2:16	-0:30	0:24	3:57	5:50	-2:08	2:03	-7:05

6.6.18. In general travel time improvements are seen across all routes apart from Route 5 northbound between the 2018 Base and 2028 DM. This is due to the inclusion of the A46 Binley junction improvement.

6.6.19. The journey times above show significant reductions in all DS scenarios on Route 1 southbound compared to the DM scenario. This is due to the removal of queuing for throughflow traffic. This is also seen in the northbound direction except for 2043 AM. This is as a result of queues not forming at the approach to the A46 Walsgrave Junction in the DM as shown in Figure 6-10, so the total

journey time would not significantly alter. The removal of queuing on the approach to A46 Walsgrave also leads to reduced journey times from the DM to DS on Route 5 southbound in all scenarios and Route 2 northbound in the 2028 PM peak. In the AM peak in 2028 and both 2043 peak hours the DM scenario has minimal queuing approaching A46 Walsgrave leading to no improvement being seen.

6.6.20. In the 2028 AM peak, Route 2 southbound increases by 2 minutes from the DM to DS. This is due to the increase in distance travelled to reach the new Walsgrave junction from the B4082 in the DS and as observed fluctuating short period queues are not fully replicated on the B4082 in the DM model. This is also seen in the 2028 and 2043 AM peaks and 2028 PM peak. Similarly, Route 5 northbound uses the B4082 to approach the A46 for an increased distance at a slower speed, leading to increased journey times in all scenarios. It is worth noting that these increases are under a minute in all cases except 2043 PM. However, it is likely that the journey time routes which utilise the B4082 eastbound approach to A46 Walsgrave are underestimating travel time in the DM given that the observed fluctuating congestion is not fully replicated on this approach in the DM and would be mitigated in the DS but this is not reflected in the model.

6.6.21. Routes 3 westbound and 4 northbound use Brandon Road where increased queuing is seen in all DS scenarios as seen in Figure 6-8 to Figure 6-11. As such increased journey times from DM to DS are seen in all scenarios here. This is likely as traffic is no longer held back at the A46 Walsgrave junction leading to increased demand in this area.

6.6.22. As noted in Section 4.13, following assessment of both the strategic and the operational modelling, it was raised that Coventry City Council had very recently been on site to implement junction infrastructure changes at Binley Road/Brinklow Road and Brinklow Road/Clifford Bridge Road signalised junctions to provide improved provision for cyclists. These changes were not raised by Coventry City Council as part of the uncertainty log and as such were not included in the traffic modelling.

6.6.23. The sensitivity test was set up for the 2043 AM and PM DM and DS operational models incorporating the revised junction layouts to understand the likely impacts of the changes. The impact of the network changes was to effectively reduce the capacity to vehicular traffic in the area.

6.6.24. As the junctions are not included in the current CoSTM forecasting, the model is likely to be over predicting the capacity and hence traffic demand in this area so any assessment is very worst case and likely to over predict congestion and

delay and traffic could reasonably be thought to reroute away from the area in future given the lower capacity conditions.

6.6.25. Table 6-29 provides the network wide summary statistics for these tests.

Table 6-29 VISSIM sensitivity test network summary statistics

	Scenario	2018	2043	2043	DS-DM
AM Peak	Total Demand (incl. latent demand)	13,078	15,076	16,410	1,334
	Latent Demand	2	571	879	309
	Average Delay s/veh	181	189	196	7
	Average Delay (incl. latent delay) s/veh	219	262	304	42
PM Peak	Total Demand (incl. latent demand)	13,668	16,697	17,864	1,168
	Latent Demand	2	689	1,087	398
	Average Delay s/veh	219	380	246	-133
	Average Delay (incl. latent delay) s/veh	219	423	361	-62

6.6.26. As can be seen in the above table, the introduction of the revised junction arrangements has a significant detrimental impact on the local area in the DM in 2043. The change in average delay in the AM and latent demand in both peaks indicates a significant increase in congestion due to the reduction in capacity. Again, it should be noted that the traffic flows used do not allow for rerouting away from the local area in response to this and are considered very worst case.

6.6.27. The introduction of the Scheme shows a detrimental impact on the summary statistics. Similar to the main assessment, the introduction of the Scheme allows more traffic to access the Brinklow Road area. This increases the pressure on the already over-congested junctions causing significant queuing, particularly from zones local to these junctions causing an increase in latent demand. Figure 6-13 and Figure 6-14 overleaf show the average peak hour speeds for the test scenarios. High levels of congestion can be seen in both AM and PM for the DM and DS scenarios for the local road network. The A46 shows less queuing and delay in the DS but this is offset by an increase in delay on the local road network.

Figure 6-13 Average peak hour speeds – 2043 AM Peak DM vs DS Test Network

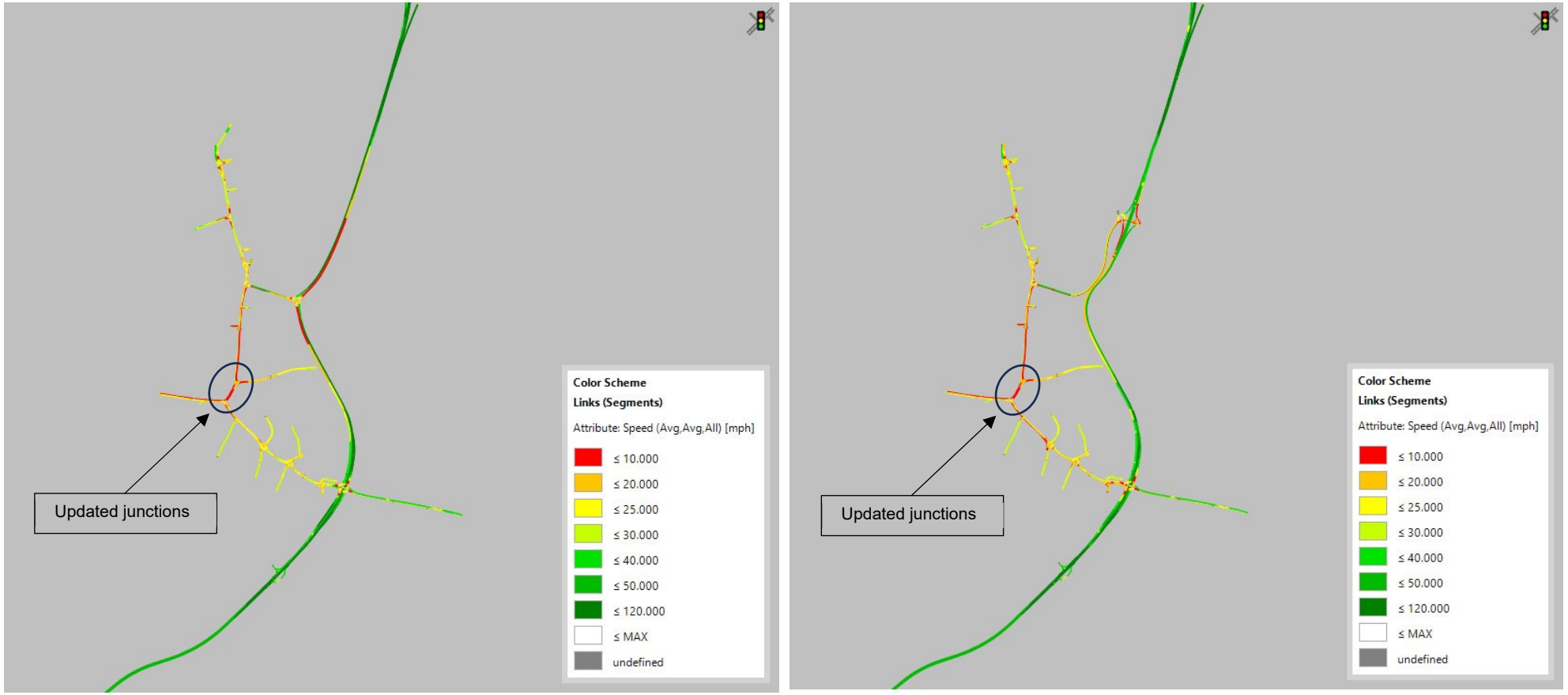
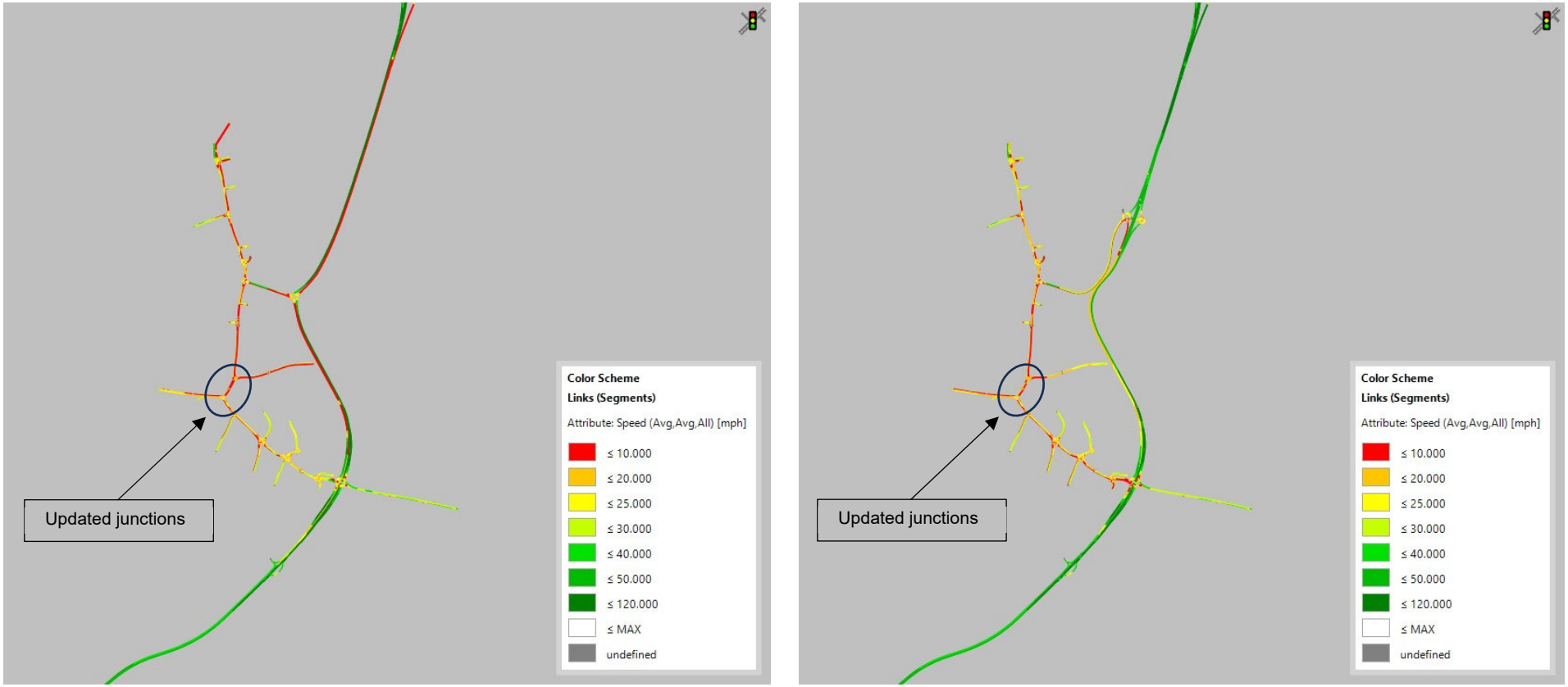


Figure 6-14 Average peak hour speeds – 2043 PM Peak DM vs DS Test Network



6.6.28. Table 6-30 and Table 6-31 give the journey time results for the test networks. Again, both the DM and DS show significant increases in journey time compared to the Base due to the implementation of the two new junctions if traffic does not decrease in response.

6.6.29. In general, journey times improve on the A46. However, due to the increased congestion on Binley Road westbound, and Brinklow Road and Clifford Bridge Road southbound, any routes using these sections show increased travel time.

6.6.30. For Route 5 southbound, in the PM peak the reduced queue at the A46 Walsgrave provides an improvement in journey time. However, in the AM peak, the additional queue on the Clifford Bridge Road southbound blocks the B4082 westbound increasing travel time on this section negating the travel time saving from the A46 southbound approach.

Table 6-30 VISSIM travel time results (minutes: seconds) - AM peak

Route	1NB	1SB	2NB	2SB	3EB	3WB	4NB	4SB	5NB	5SB
2018 Base	7:35	15:27	10:17	12:30	4:55	4:49	10:23	9:14	5:08	9:58
2043 Do Minimum	8:02	9:36	10:19	6:13	7:60	5:02	10:22	12:31	7:33	15:25
2043 Do Something	6:45	5:44	17:52	9:05	8:26	10:50	15:42	14:07	7:45	20:26
DS - DM	-1:17	-3:52	7:33	2:52	0:26	5:48	5:20	1:35	0:12	5:01

Table 6-31 VISSIM travel time results (minutes: seconds) - PM peak

Route	1NB	1SB	2NB	2SB	3EB	3WB	4NB	4SB	5NB	5SB
2018 Base	13:25	12:23	14:44	13:35	5:10	5:47	10:41	11:04	5:41	6:50
2043 Do Minimum	12:60	17:48	17:02	10:35	8:09	9:34	15:23	18:26	7:34	25:57
2043 Do Something	8:36	5:36	24:46	10:41	9:54	18:47	24:13	15:04	7:29	19:39
DS - DM	-4:23	-12:12	7:44	0:06	1:46	9:13	8:50	-3:22	-0:06	-6:18

6.7. Journey time reliability and network resilience

6.7.1. Resilience is defined as the capacity to recover quickly. Therefore, network resilience is the ability of the road network to be able to deal and recover quickly from events. This is closely linked to reliability. The term reliability refers to variation in journey times that are unable to be predicted (journey time variability, or JTV). Such variation could come from recurring congestion at the same period

each day (day-to-day variability, or DTDV) or from non-recurring events, such as incidents. It excludes predictable variation relating to varying levels of demand by time of day, day of week, and seasonal effects which travellers are assumed to be aware of.

6.7.2. The implementation of the Scheme will generate reliability benefits as road capacity is increased, delays are shortened and accidents (and their impacts) are reduced, all of which contribute to improved reliability. It can then be concluded that the improved reliability of the A46 as a result of the Scheme will also lead to increased network resilience.

6.7.3. Journey time reliability analysis has been undertaken to assess the economic impacts of the Scheme. The economic assessment of the Scheme as set out within the Case for the Scheme (**TR010066/APP/7.1**), indicated that the Scheme would generate a positive journey time reliability improvement.

6.8. Summary

6.8.1. The RIS2 Scheme description is “grade separation of the Binley and Walsgrave roundabouts on *the A46 near Coventry, upgrading the trunk road sections of the A45 and A46 between the M6 and M40”.*

6.8.2. The 2028 and 2043 flows generally showed an increase in flows on the A46 between the DM and the DS, and a reduction in flows on the local roads. The exception was in the Inter Peak time period in 2028 where there were decreases in flow between the DM and DS on the A46 through the local area and on the B4082 in both directions. This appears to be as a direct result of the increased travel distance (and hence time) of the new junction arrangement. Where flows in the scenarios are relatively low, the travel time of using the now longer realigned B4082 is less desirable than other routes over the wider area with more traffic on the A444 north of Stivichall Interchange, the B4082 east of the A444 and Ansty Road. This was not seen in the 2043 Inter Peak scenarios which follows the pattern of the AM and PM as flow levels and travel times increase making the Scheme more competitive for travel times.

6.8.3. As the introduction of the Scheme introduces a change in the links used to perform required travel movements, it is not always easy to understand the impact of the Scheme by looking at simple difference plots for delay. For example, trips moving from the A46 to the B4082 would use the Scheme junction requiring travel on additional link sections.

6.8.4. As such, analysis of the impact of the Scheme on travel times was carried out based on key movements through and around the Scheme area based on five two-way routes.

6.8.5. In 2028, when comparing the DS to the DM, further improvements were seen on the A46 in both directions with the exception of the Inter Peak which stayed relatively stable in line with the flow changes noted previously.

6.8.6. For both the A46 north to Clifford Bridge Road south and A46 south to Clifford Bridge Road north, increases in travel time were seen when conditions were less congested due to the additional travel distance required to complete the movement. However, this additional distance travel time was counteracted when congestion was high, with the new alignment removing the queue on the approach to the A46 Walsgrave junction from its current alignment.

6.8.7. Away from the A46, the A428 east-west through Binley saw very minor increases in travel time. However, Clifford Bridge Road between Brinklow Road and the University Hospital Coventry access saw small decreases in travel time. The travel times in 2043 saw a similar pattern to 2028.

6.8.8. When comparing DM to DS in 2028 and 2043 a significant increase in speed is seen on all approaches to A46 Walsgrave junction in all peak periods indicating a reduction in congestion. However, decreases in speed are seen on the A46 links from Walsgrave to Tollbar Island southbound and from Tollbar Island to Binley northbound. This is due to the increased traffic on these links slowing the overall speed. Very little change is seen on Clifford Bridge Road or for most sections of Binley Road although the approaches to the A46 Binley junction do decrease both eastbound and westbound in some scenarios likely due to rerouting.

6.8.9. In terms of operational traffic impacts on the highway network, Modelling indicated that the introduction of the Scheme improved journey times and reduced queues on the A46 through the modelled area despite increases in traffic levels in the with Scheme scenario. Some increases in travel time were seen on local routes with increased queueing on Brandon Road and Brinklow Road. This was likely due partly to increased demand for trips in this area in the DS, leading to increased congestion. However, this was also likely affected more significantly by traffic previously held back at A46 Walsgrave in the DM which can now reach this area in the DS.

6.8.10. Queue lengths extending to the A46 were not seen in the with Scheme scenario in either peak period or year modelled.

7. Road Safety

7.1. Road safety audit

7.1.1. The preliminary design has been subject to a stage 1 road safety audit (RSA). The RSA for the Scheme was carried out by an independent road safety audit team in accordance with DMRB GG 119 Road safety audit.

7.1.2. An RSA is an important part of the process for designing safe roads. An audit is carried out at four stages in the development of highways schemes starting with the completion of the preliminary design (stage 1 RSA), the completion of the final design (stage 2 RSA), at completion of construction (stage 3 RSA) and 12-months post-opening of the operation of the Scheme (stage 4 RSA). The role of the auditors is to identify aspects of the engineering interventions that could give rise to road safety problems and to propose changes to the design or other mitigation measures. The RSA is carried out by auditors with experience of collision data analysis, road safety engineering experience and an understanding of highways design principles such as design requirements and best practice.

7.1.3. Coventry City Council has been consulted during the Stage 1 RSA, as future owner and maintainer of the B4082. Consultation and engagement with Coventry City Council in relation to future RSA's will be undertaken by the project team.

7.2. Accident Data Overview

7.2.1. Department for Transport Stats19 accident data records have been analysed, over the 2015-2019 period, to identify all reported accidents which have occurred across the Scheme impact area. The data set includes details of all recorded slight, serious and fatal accidents across the time period. Where observed data was not available, default accident rates have been used.

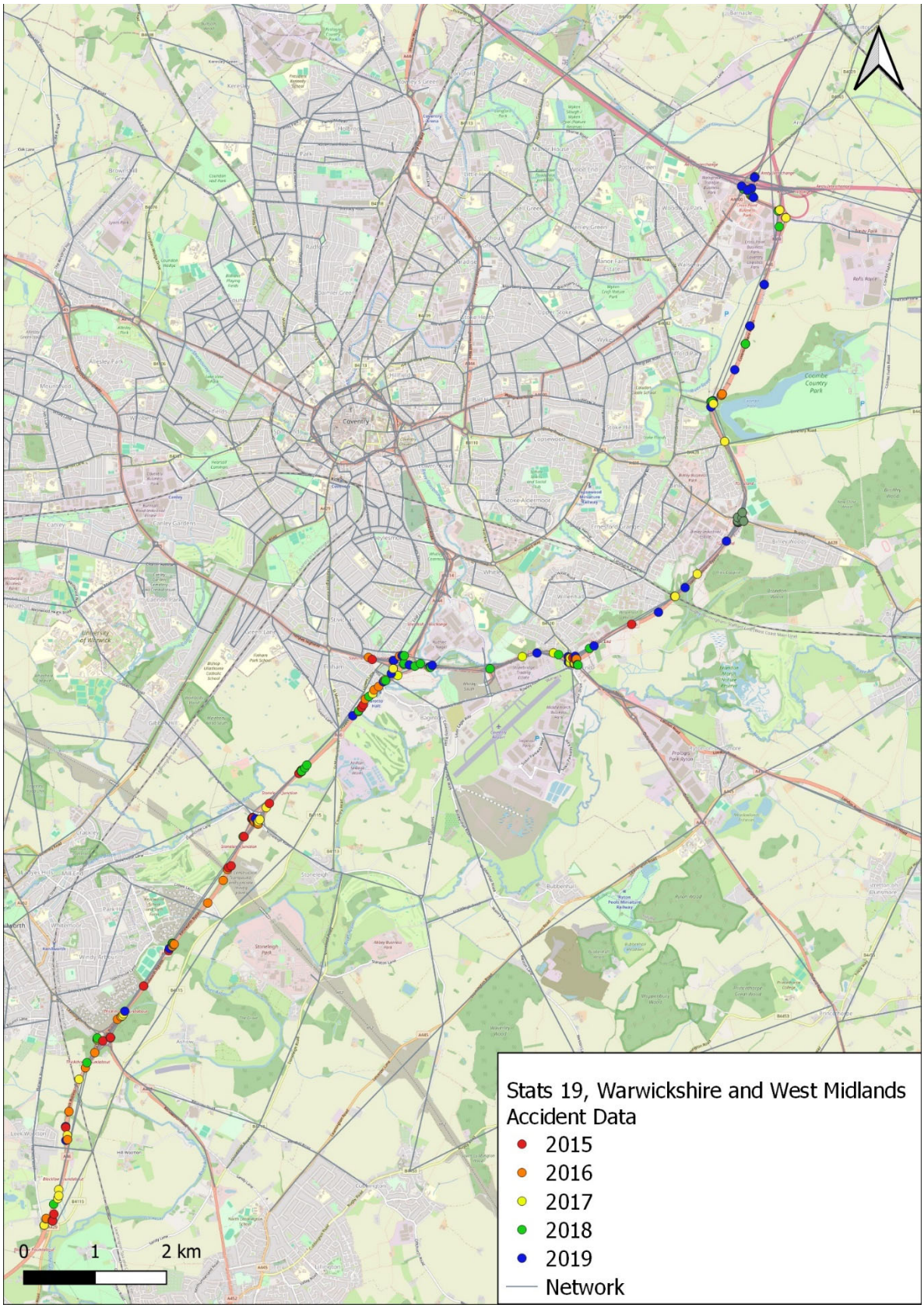
7.2.2. This information has been adopted to provide observed accident rates as an input to the COBA-LT (Cost-Benefit of Accidents - Light Touch) modelling assessment.

7.2.3. The economic appraisal for the Scheme includes monetised benefits associated with road safety. Reported Personal Injury Collision (PIC) data was provided for the A46 Trunk Road by National Highways in July 2023 covering the period 2015 to 2022 inclusive. This was filtered to the 3 year, pre covid restrictions, time period 2017 to 2019.

7.2.4. For the economic appraisal, a 5 year period for observed accidents is recommended and as such, the 2015-2016 data collated as part of the option selection stage assessment were appended to the data set to avoid periods affected by COVID-19 travel restrictions or the construction of the A46 Binley junction upgrade.

7.2.5. The PIC data includes data on road accidents reported to the police where at least one person is injured. Several people can be injured in one accident, resulting in multiple casualties being recorded. Figure 7-1 shows the location of the PICs in the study area by location and year.

Figure 7-1 A46 Observed Accidents Analysis (2015 and 2019)



7.2.6. The observed accidents by accident type are summarised in Table 7-1.

Table 7-1 Locally Observed Accidents, 2015 to 2019

Year	2015	2016	2017	2018	2019	Total
Fatal	3	0	1	0	0	4
Serious	3	8	2	5	10	28
Slight	25	23	33	29	25	135
Total	31	31	36	34	35	167

7.3. Scheme benefits

7.3.1. An assessment has been made of the number of accidents, and their associated costs, using COBA-LT. COBA-LT assesses the safety aspects of road schemes using detailed inputs of either separate road links and road junctions that would be impacted by a scheme, or combined links and junctions. The assessment is based on a comparison of accidents by severity and associated costs across an identified network in 'without scheme' and 'with scheme' forecasts, using details of link and junction characteristics, relevant accident rates and costs and forecast traffic volumes by link and junction.

7.3.2. Table 7-2 below presents the predicted change in number of accidents and Table 7-3 shows the predicted casualty reductions that would occur due to the implementation of the Scheme. As the tables show, the Scheme would result in an overall decrease in the number of accidents and casualties. However, this includes an increase in fatal casualties. This is based on long term, country wide, accident rates that predict accident severity proportions using road type. The number of predicted Killed or Seriously Injured (KSI) due to an increase in vehicle flows on a road type with a high KSI proportion would not therefore be offset by the same number of KSI reduction for the same vehicle flow reduction on a road with a lower KSI proportion due to a different road type.

7.3.3. Although the Do Something (with) and Do Minimum (without) Scheme scenarios both generate accident costs in monetary terms, the Scheme results in monetary disbenefits over the 60-year appraisal period due to this increase in fatal accidents.

Table 7-2 Predicted accident occurrence

Accident Results	Accidents and Accident Costs
Number of accidents – without Scheme	30,094
Number of accidents – with Scheme	30,034
Total accident change*	**-61***

*Note: Values are rounded so may not appear to add up as whole numbers

Table 7-3 Predicted casualty occurrence

Accident Results	Casualty Statistics
Fatal casualties – Without Scheme	322
Fatal casualties – With Scheme	325
Total change in fatal casualties	**2***
Serious casualties – Without Scheme	3,796
Serious casualties – With Scheme	3,795
Total change in serious casualties	**-1**
Slight casualties – Without Scheme	37,012
Slight casualties – With Scheme	36,944
Total change in slight casualties	**-69***

*Note: Values are rounded so may not appear to add up as whole numbers

7.3.4. Increases in accident costs are predominantly seen on the A46 and M69 links. This corresponds to the increase in traffic on these links as vehicles reroute to take advantage of the reduced journey time through the Scheme. An exception is the A46 southbound approach to the Scheme where the removal of the junction and realignment of the carriageway leads to a decrease in predicted accident costs due to the lower speed limit, higher standard and safer road type that will be delivered by the Scheme.

7.3.5. Some reductions in costs are seen in the local area although many links within Coventry are largely unaffected.

7.3.6. When considering the junctions assessed, the removal of the existing A46 Walsgrave roundabout gives a reduction in predicted accidents. The new A46 Walsgrave dumbbell arrangement does not offset this reduction as the flows through the new roundabout junctions are significantly lower and hence do not have an equivalent predicted accident rate. An increase in predicted accidents is seen at the A46 Binley due to the increased traffic wishing to utilise the A46 in this area.

7.3.7. The National Highways Safety Framework requires that for any scheme reasonable steps are taken to minimise the risk of death and injury arising from the scheme including:

- contributing to the overall reduction in road casualties;
- contributing to the overall reduction in the number of unplanned incidents;
- contributing to improvements in road safety for pedestrians and cyclists.

7.3.8. As demonstrated by the reduction in overall number of road casualties and number pf predicted accidents, the Scheme is considered to satisfy this requirement. The impact on pedestrians and cyclists is discussed in Section 8. In line with recent NH requirement updates, it is required that the accident analysis is also disaggregated into those that occur on the SRN. This is not additional benefit but sets out the benefits that can be directly attributed to the SRN.

7.3.9. An accident assessment has been carried out using COBA-LT using the same methodology as the full assessment but with any local road links and junctions removed. Table 7-4 below presents the predicted change in SRN accidents and Table 7-5 shows the predicted SRN casualty changes that would occur due to the implementation of the Scheme. As the tables show, the Scheme would result in an overall increase in accidents and casualties on the SRN.

Table 7-4 Predicted SRN accident occurrence

Accident Results	Accidents and Accident Costs
Number of accidents – without Scheme	7,634
Number of accidents – with Scheme	7,664
Total accident change	**30**

Table 7-5 Predicted SRN casualty occurrence

Accident Results	Casualty Statistics
Fatal casualties – Without Scheme	122
Fatal casualties – With Scheme	124
Total change in fatal casualties *	**3***
Serious casualties – Without Scheme	825
Serious casualties – With Scheme	836
Total change in serious casualties	**11**
Slight casualties – Without Scheme	10,496
Slight casualties – With Scheme	10,534
Total change in slight casualties	**38**

*Note: Values are rounded so may not appear to add up as whole numbers

7.3.10. Combining the results from the full and the SRN assessments therefore indicates a decrease in accidents on the local roads as seen in Table 7-6. Here, a negative number indicates a decrease in accidents with the Scheme.

Table 7-6 Distribution of accident occurrence savings by severity

Area	Fatal	Serious	Slight	Total
SRN	3	11	38	52
Local	-1	-12	-107	-119
Total	2	-1	-69	-67

7.3.11. In summary, the introduction of the Scheme leads to a decrease in overall accidents across the combined SRN and local road network. Although a decrease in the total number of accidents and casualties is seen, the monetary valuation is a disbenefit as more KSI accidents are predicted which have a higher cost than slight accidents. In both cases, this is attributable to a shift from accidents on local roads to the SRN as traffic reroutes onto the A46.

7.3.12. However, it should be noted that the combined impact of The A46 Coventry Junctions Scheme (i.e. both Binley and Walsgrave) predicts an overall decrease in both total number of accidents and KSI over all and broken down for either the SRN or local roads indicating an improvement in safety due to the combined scheme for the wider SRN as well as local roads as shown in Table 7-7. A negative number indicates a decrease in the predicted number of accidents.

Table 7-7: Combined A46 Coventry Junctions assessment distribution of accident casualty occurrence savings by severity

Area	KSI	Slight	Total
SRN	-1	-256	-257
Local	-18	-141	-159
Total	-18	-397	-416

8. Walking, cycling and horse-riding

8.1. WCH provision within the Scheme

8.1.1. At present only bridleway 156/R75x/1 from Farber Road to Walsgrave Hill Farm (via the Farber Road overbridge) provides PRoW facilities within the Order Limits. No works are proposed to this bridge. Operation of the Scheme would not result in any impacts on any existing WCH facilities, and the Scheme would not lead to any changes to the existing local WCH network.

8.1.2. A signalised pedestrian crossing would be provided on the B4082 link road to the immediate east of the Clifford Bridge Road/B4082 roundabout. This would improve the north-south movement of pedestrians along the eastern side of Clifford Bridge Road between Wyken and Binley. This would become a Coventry City Council asset. The crossing also involves installing loops for the functioning of the crossing within the circulatory carriageway of Clifford Bridge Road roundabout. Associated with the crossing, pedestrian guard railing may also be installed around the south-eastern and north-eastern curves of the roundabout.

8.1.3. The Applicant proposes to retain the Hungerley Hall Farm accommodation bridge as part of the Scheme and will continue to maintain the asset. Should the requirements for farm access change in future as a result of development in the area, the Applicant is open to discussing the future use of the bridge with any prospective applicant of Local Plan allocation H2:3 and Coventry City Council in regard to its future use as an active travel route, at that point in time.

8.1.4. The Scheme does incorporate enabling works for future WCH provision to be provided by others. This includes additional earth works which provides verge widening along the new section of the B4082 link road to accommodate the future provision of a segregated walking and cycling route and a section of shared use path by others. No verge widening is proposed to the existing B4082 to deter unauthorised WCH access along the new B4082 towards the A46. Ducting would be provided in the road and verge to allow for a future signalised pedestrian crossing to be installed across the B4082 link road to access the Hungerley Hall Farm accommodation bridge.

8.1.5. A surfaced WCH route and signalised crossing at the Hungerley Hall Farm accommodation overbridge would not be provided as part of the Scheme to deter the public from erroneously entering the agricultural land to the east of the A46 mainline. A gate would be provided across the western entrance to Hungerley Hall Farm accommodation overbridge to prevent trespass onto agricultural/private land and avoid a potential road safety hazard due to the use of the bridge for farm traffic. Access would be maintained for agriculture.

8.1.6. As noted previously, the National Highways Safety Framework requires that, for any scheme, reasonable steps are taken to minimise the risk of death and injury arising from the scheme by contributing to improvements in road safety for pedestrians and cyclists.

8.1.7. The Scheme has prioritised safety in design and is modelled to decrease the overall number of accidents on the road network by creating a high-quality dual carriageway, with the provision of new cycling and walking infrastructure, providing safety improvements for walkers, cyclists and vulnerable users.

8.1.8. The findings from the WCH surveys show that there are a notable number of unaccompanied minors crossing the B4082 near Clifford Bridge Road roundabout. Timings of these movements coincide with school hours. The existing crossing point that is used is an uncontrolled crossing to an island. The Scheme will provide a new signalised pedestrian crossing at this location to provide a safe crossing point on B4082. The Scheme is therefore consistent with the National Highways Safety Framework requirements.

8.1.9. A WCH assessment was undertaken, and the outcome is provided in ES Chapter 12 (Population and Human Health) (**TR010066/APP/6.1**). Details of the design mitigation and enhancement measures are shown on ES Figure 12.3 (Design mitigation and enhancement measures) (**TR010066/APP/6.2**).

9. Public Transport

9.1.1. There are no significant changes proposed to public transport routeing or facilities due to the Scheme.

9.1.2. However, users on bus services that pass through the A46 Walsgrave junction, will benefit from improved journey times. Minor positive impacts on bus journey times on the local road network may also indirectly result from the Scheme as traffic reassigns away from these routes and onto the SRN. Furthermore, any other private coach services such as National Express will also benefit from improved journey times for services travelling through the A46 Walsgrave junction.

10. Conclusions

10.1. Policy Context

10.1.1. In terms of adherence to national policy requirements, the Scheme demonstrates compliance with the Government's strategic vision for the development of the national road network. The benefits of the Scheme are demonstrated by its inclusion within the RIS and within national, regional and local transport and planning policy. Section 3(6) of the Infrastructure Act 2015 places a duty on the SoS to comply with the provisions of the RIS.

10.1.2. The NPS NN highlights the importance of the national road network and that responding to economic and traffic growth are the key drivers for its development.

10.1.3. The Scheme is also consistent with the core planning principles laid out in the NPPF and is consistent with national planning policy through local planning documentation.

10.1.4. In this aspect the Scheme is wholly aligned with national policies. The Scheme is intended to alleviate congestion and accommodate future traffic growth, and contribute to increased economic growth, both regionally and nationally.

10.1.5. Regional and local planning policy recognises the A46 as a crucial piece of local infrastructure and highlights that the A46 currently suffers from congestion which is placing a constraint on local growth.

10.1.6. By increasing road capacity, reducing congestion at the new junction and improving green infrastructure, the Scheme will encourage inward investment, support housebuilding and support the economic growth in the Coventry and Warwickshire areas.

10.1.7. The Scheme also accords with the policies of the Coventry City Council Local Plan and the Rugby Borough Council Local Plan in contributing to key regional infrastructure needed to support economic and housing growth.

10.2. The Impact of the Scheme on Traffic Conditions

10.2.1. The Scheme fulfils its objectives by providing capacity, relieving congestion, improving journey times and increasing accessibility for the local communities.

10.2.2. The modelling analysis indicates that the forecasted local and regional traffic growth will cause a significant increase in delays at Walsgrave Junction and along the A46 and B4082. The Scheme, however, provides the required capacity improvements to allow for the forecasted traffic growth.

10.2.3. In terms of operational traffic impacts on the highway network, the VISSIM modelling assessment show the Scheme is operating successfully with 2043 forecasted demand. The junction improvements provided by the Scheme generate benefits with respect to congestion relief.

10.2.4. In summary it is considered that the Scheme provides the following transport benefits:

- The Scheme provides additional capacity and improved journey times which may encourage housing and economic growth in the local area as well as across the A46 corridor.
- The Scheme improves accessibility for local communities by reducing congestion along the A46 corridor.
- The Scheme improves operational issues by reducing congestion at the Walsgrave Junction, along the A46 and the B4082.
- The Scheme is predicted to reduce traffic flows on many local roads.
- The Scheme improves journey time reliability for the area.
- Public transport routes are expected to be more consistent on the local road network due to reduction of congestion and delays on the A46.

10.2.5. VISSIM modelling shows the Scheme junction operating satisfactorily without any significant excess queuing.

10.2.6. Road traffic congestion is significantly reduced by the Scheme, with journey times along the A46 reducing in the 2043 Do Something scenario to be approximately equivalent or better than 2018.

10.3. The Impact of the Scheme on Walking and Cycling

10.3.1. The Scheme provides support to walking, cycling and other vulnerable users by incorporating safe, convenient, accessible and attractive routes for pedestrians and cyclists.

10.3.2. The provision of a new signalised pedestrian crossing facility on the eastern arm of the Clifford Bridge Road roundabout to facilitate safe north to south movements across the B4082.

10.3.3. The retention of Hungerley Hall Farm accommodation overbridge allows for a future WCH route to be provided through to Coombe Country Park, to be delivered in the future in parallel with local developments. To help facilitate this the Scheme provides a widened verge within the extents of the new B4082 link road to allow a WCH connection to be delivered by others in the future.

10.4. The impact of the Scheme on Public Transport

10.4.1. There are no significant changes proposed to public transport routeing or facilities due to the Scheme. As such, due to the limited number of public transport services that utilise the A46 in this area, the Scheme is unlikely to have a significant impact on bus journey times. However, as congestion and vehicle flows on local routes are predicted to decrease, a small positive impact is likely for local services and services that pass through the A46 Walsgrave junction.

10.5. The impact of the Scheme on accidents

10.5.1. The Scheme results in an overall decrease in the number of accidents and casualties. However, this includes an increase in fatal casualties. In total, COBA-LT analysis indicates that, over a 60-year timeframe the Scheme improvements will save a total of 61 accidents but with an increase of 1 KSI casualty.

10.6. The impact of the Scheme on network resilience and journey time reliability

10.6.1. The implementation of the Scheme will generate reliability benefits as road capacity is increased, delays are shortened and accidents (and their impacts) are reduced, all of which contribute to improved reliability. It can then be concluded that the improved reliability of the A46 as a result of the Scheme will also lead to increased network resilience.

10.7. Conclusions

10.7.1. In conclusion, the Scheme fulfils its objectives by providing capacity, relieving congestion, improving journey times and reliability as well as network resilience.

10.7.2. The modelling analysis indicates that the forecasted local and regional traffic growth will cause the existing Walsgrave Junction to be over capacity. This will in turn create an increase in delays along adjacent sections of the A46. The Scheme, however, provides the required capacity improvements to allow for the forecasted traffic growth.

10.7.3. In terms of operational traffic impacts on the highway network, the local junction modelling assessment show the Scheme is operating in almost free-flow conditions with 2043 forecasted demand. The junction improvements provided by the Scheme generate benefits with respect to congestion relief as well as road safety. Further information on the Scheme's environmental and economic impacts can be found in ES Chapters 5-15 (**TR010066/APP/6.1**) and Section 5 of the Case for the Scheme (**TR010066/APP/7.1**) respectively.

10.7.4. It is considered that the Scheme achieves the main Scheme objectives to provide relief from traffic congestion and improve journey times by increasing the capacity of the two remaining at-grade junctions on the A46 between the M6 and the M40, benefitting both the strategic and local traffic needs and supporting future growth forecasts from Coventry City Council.

10.7.5. The Government has highlighted the express need for further growth and improvements to the national networks within the NPS NN. The Road Investment Strategies support the Scheme as a required improvement to the SRN.

10.7.6. The Scheme itself complies with national planning policy within the NPS NN and NPPF in reducing congestion-related delay, improving journey time reliability, increasing the overall capacity of the A46 and improving traffic flow.

11. Acronyms and Abbreviations and Glossary of Terms

Acronyms and Abbreviations

Acronyms and Abbreviations	Meaning
AADT	Average Annual Daily Traffic
AM	Ante meridiem (before midday)
AoDM	Area of Detailed Modelling
BCR	Benefit to Cost Ratio
CAS	Common Analytical Scenarios
CCTV	Closed circuit television
COBA-LT	Cost and Benefit to Accidents – Light Touch
CoSTM	Coventry Strategic Transport Model
DCO	Development Consent Order
DfT	Department for Transport
DM	Do-Minimum
DS	Do-Something
DTDV	Day-to-day variability
ES	Environmental Statement
FMA	Fully Modelled Area
GEH	Geoffrey E. Havers Statistic
GVA	Gross Value Added
ha	Hectares
IP	Inter Peak
JTV	Journey time variability
km	Kilometres
KPI	Key Performance Indicator
KSI	Killed or Seriously Injured
LEP	Local Enterprise Partnership
LPA	Local Planning Authority
m	Metres
Mph	Miles per hour
MRTM	Midlands Regional Transport Model
NPPF	National Planning Policy Framework
NPS NN	National Networks National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OD	Origin-Destination
PA 2008	Planning Act 2008
PIC	Personal Injury Collision

Acronyms and Abbreviations	Meaning
PM	Post Meridiem (after midday)
PRoW	Public Rights of Way
RIS 1	Road Investment Strategy 1
RIS 2	Road Investment Strategy 2
RP1	Roads Period 1
RP2	Roads Period 2 / Second Road Period
RSA	Road Safety Audit
SATURN	Simulation and Assignment of Traffic to Urban Road Networks
SPD	Supplementary Planning Document
SRN	Strategic Road Network
TAG	Transport Analysis Guidance
TDP	Transport Decarbonisation Plan
TMP	Traffic Management Plan
VDM	Variable Demand Modelling
VISSIM	VISSIM is a micro-simulation modelling software developed by the PTV Group, Germany: https://www.ptvgroup.com/en/solutions/products/ptv-vissim/
WCH	Walking, Cycling and Horse Riding

Glossary of Terms

Term	Meaning
The 2008 Act	The Planning Act 2008.
Annual Average Daily Traffic	The total volume of vehicle traffic of a motorway or road for a year divided by 365 days.
The Applicant	National Highways.
Area of Detailed Modelling	The area within which significant changes in flow and speed due to the Scheme may be expected to occur. The AoDM has been specified as detailed, simulation, network.
At-grade	On the same level. For example, when a road is on the current ground level.
Base year	The outputs of the traffic model coinciding with the year the traffic data was collected.
Benefit to Cost Ratio	The benefit cost ratio is a presentation of the amount of benefit being bought for every £1 of cost to the public purse – the higher the BCR the greater the benefit for every £1 spent.
Bypass	The diversion of a major road to carry traffic around a built-up area, constructed to improve the journey of through traffic and/or improve the environmental conditions along the original route.

Term	Meaning
Case for the Scheme	The Case for the Scheme aims to provide details of the need and case for the Scheme. It provides key information in support of the Scheme and demonstrates the robustness of the application made, following careful consideration of alternatives.
Climate	Long-term weather conditions prevailing over a region.
Climate change	This refers to a change in the state of the climate, which can be identified by changes in average climate characteristics which persist for an extended period, typically decades or longer.
Closed-circuit Television	A type of video surveillance.
Congestion	A situation where the volume of traffic is too great for the road, causing vehicles to slow down or stop, often caused by bottlenecks, traffic incidents and junction design.
Consultation Report	The Report which sets out how the Applicant has complied with the consultation requirements of the Planning Act 2008 and how the Applicant has had regard to the responses received.
Cost and Benefit to Accidents – Light Touch	COBA-LT software undertakes the analysis of the impact on accidents as part of the economic appraisal for a road scheme, in accordance with the Department for Transport's Transport Analysis Guidance.
Department for Transport	The national Government body responsible for transport in Britain, and therefore in overall control of the road network. It is responsible for policy decisions, and its responsibilities are carried out by a range of agencies and local authorities.
Development Consent Order	The consent for a Nationally Significant Infrastructure Project required under the Planning Act 2008.
Design Manual for Roads and Bridges	The Design Manual for Roads and Bridges contains information about current standards relating to the design, assessment and operation of motorway and all-purpose trunk roads in England.
Do Minimum	The conditions that would persist in the absence of the implementation of a construction or improvement scheme but on the basis that maintenance on the road network is ongoing.
Do Something	The conditions that would occur as a consequence the implementation of a construction or improvement scheme.
Earthworks	The removal or placement of soils and rocks such as in cuttings, embankments and environmental mitigation, including the in-situ improvement of soils/rocks to achieve the desired properties.
Environmental Statement	A statutory document which reports the EIA process, produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations.
Essential Mitigation	Mitigation required to offset the impacts as a result of construction and operation of the Scheme, which is secured through a Development Consent Order.
GEH Statistic	The Geoffrey E. Havers Statistic is a formula used in traffic modelling to compare two sets of traffic volumes. This avoids the pitfalls that occur when using simple percentages where volumes vary over a wide range so that a small numerical difference from a small initial value leads to a high percentage change being reported.

Term	Meaning
Grade separated	A type of junction where the major route (or routes) through the junction do not stop and do not cross any other road on the level. Movements to other roads are made using slip roads and bridges.
Green Belt	A designation for land around certain cities and large built-up areas, which aims to keep this land permanently open or largely undeveloped.
Gross Value Added	A measure of the total value of goods and services produced in an economy.
Habitat	The place or type of site where an organism or population naturally occurs. Often used in the wider sense referring to major assemblages of plants and animals found together.
Junction	A place where two roads meet, regardless of design or layout.
Key Performance Indicator	Critical quantifiable indicators of progress towards a result.
Land Use	What land is used for, based on broad categories of functional land cover, such as urban and industrial use and the different types of agriculture and forestry.
Local Enterprise Partnership	Partnerships between local authorities and businesses. They decide what the priorities should be for investment in roads, buildings and facilities in the area
Local Planning Authority	The body empowered by law to exercise planning functions.
Midlands Regional Transport Model	The modelling for the Scheme is based on this model. MRTM2 is one of five Regional Transport Models used to assess programme level strategies across regions and provide a starting point for the development of detailed proposed scheme specific models, where networks, volumetric counts and availability of travel demand data can reduce the trafficking modelling programme
Mitigation	Measures intended to avoid, reduce and, where possible, remedy significant adverse environmental effects as the result of the Scheme.
Motorway	A special type of road reserved for motorised traffic only, the numbers of which are prefixed with the letter ‘M’.
Nationally Significant Infrastructure Project	Nationally Significant Infrastructure Project, further defined within Chapter 1 of this Case for the Scheme.
National Planning Policy Framework	A planning framework which sets out the Government's planning policies for England and how these are expected to be applied.
National Networks National Policy Statement	A statement setting out the need for, and the Government’s policies to deliver, the development of Nationally Significant Infrastructure Projects on the national road and rail networks in England.
Noise	Unwanted sound.
Operational	The functioning of the Scheme on completion of construction.
Order Limits	The extent of the area within which the Scheme may be carried out.
Public right of way	A highway where the public has the right to pass. It can be a footpath (used for walking), a bridleway (used for walking, riding a horse and cycling), or a byway that is open to all traffic (including motor vehicles).

Term	Meaning
Road Investment Strategy	A document which sets a long-term strategic vision for the network. With that vision in mind, it then: specifies the performance standards Highways England (National Highways) must meet; lists planned enhancement schemes National Highways expect to be built; and states the funding that they will make available during the first Road Period (RP), covering the financial years 2015/16 to 2019/20.
Road Investment Strategy 2	A document which sets a long-term strategic vision for the network. With that vision in mind, it then: specifies the performance standards Highways England must meet; lists planned enhancement schemes National Highways expect to be built; and states the funding that they will make available during the second Road Period (RP2), covering the financial years 2020/21 to 2024/25.
Road Safety Audit	There are four stages of a Road Safety Audit (RSA) where the design is audited by independent road safety auditors.
Roundabout	A circular, one-way junction at which other roads meet and terminate.
Simulation and Assignment of Traffic to Urban Road Networks	SATURN is a powerful and flexible highway assignment software package.
The Scheme	The A46 Coventry Junctions (Walsgrave) Scheme for which development consent is being sought.
Stakeholder	An organisation or individual with a particular interest in the Scheme.
Strategic Road Network	The network of motorways and trunk roads in England.
Supplementary Planning Document	Supplementary Planning Documents (SPDs) are additional guidance on some of the policies of the Local Plan. They provide detailed guidance on how planning policy will be implemented3. SPDs do not have the same status as the policies in the Local Plan but have been subject to public consultation and are taken into account as material considerations in dealing with planning applications
Transport Analysis Guidance	Guidance produced by the Department for Transport for undertaking transportation studies, appraisals and modelling. Also referred to as WebTAG.
Transport Decarbonisation Plan	A plan that sets out the government's commitments and the actions needed to decarbonise the entire transport system in the UK.
Traffic Management Plan	A document that sets out how construction traffic including site personnel movements will be controlled to ensure the safe and efficient delivery of the Scheme.
Variable Demand Model	Used to predict the future levels of demand for private vehicle travel, taking into account trip generation, distribution and mode split.
Value for Money	An assessment that takes into consideration both the monetised and unmonetised benefits and costs of the Scheme.
VISSIM	VISSIM is a micro-simulation modelling software developed by the PTV Group, Germany: https://www.ptvgroup.com/en/solutions/products/ptv-vissim/
Walkers, cyclists and horse-riders	A collective term used to describe pedestrians, cyclists and equestrians.