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A38 Bromsgrove Route Enhancement Programme

March 2023

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1. Executive Summary

Following the announcement of the A38 Bromsgrove Route Enhancement Programme (BREP) in the DfT's Programme Entry in August 2022, Worcestershire County Council (WCC) is pleased to submit this Full Business Case (FBC) to the Department for Transport (DfT) for the full approval. The promoted scheme will deliver a major upgrade of the A38 corridor, which is a key part of the Major Road Network (MRN) in Worcestershire.

Ultimately, not delivering significant enhancements to the A38 corridor will mean that the MRN national priorities will not be achieved in the region. The objectives of key policies set out by the Worcestershire Local Enterprise Partnership (WLEP) in their Strategic Economic Plan (SEP), by WCC in the Local Transport Plan (LTP) and the District Council's in the Local Plans, will also not be realised.

1.1 Changes to the Scheme Since Outline Business Case

The A38 BREP MRN package has evolved through different stages of the business case development. Changes since the Outline Business Case (OBC) stage submission (dated November 2021) are summarised below:

- The replacement of the OBC stage walking/cycling bridge (Scheme 3) from Harvington Road to Old Station Road with the new Scheme 3 active travel corridor enhancements.

  The original Scheme 3 was designed to reduce severance across the A38. It was proposed to build upon the work undertaken as part of the National Productivity Infrastructure Fund (NPIF) Bromsgrove Scheme and tackle local severance by providing an active travel corridor between the Bromsgrove Town Centre and Bromsgrove Rail Station (which is a key desire line that forms an important part of WCC active travel strategy for Bromsgrove).The original Scheme 3 proposal involved the construction of new a pedestrian/cycle bridge across the A38 from Harvington Road to Old Station Road, which was originally severed as part of construction of the A38 and served as an important link between Aston Fields and Bromsgrove. To ensure compliance with Local Transport Note (LTN) 1/20 standards, the bridge design included large access ramps compared to those envisaged at Strategic Outline Case (SOC) Stage, resulting in wider environmental and local concerns, in addition to impacts on the value for money.

  The new Scheme 3 aims to tackle the same local severance by providing active travel corridor enhancements between the Bromsgrove Town Centre and Bromsgrove Rail Station.

- The introduction of a new active mode corridor improvement scheme, namely Scheme 9. Following the OBC submission, an LTN 1/20 compliance assessment was undertaken which highlighted the need for traffic calming measures along the corridor which were not previously envisaged. Therefore, Scheme 9 has been introduced and includes the installation of LTN 1/20 compliant traffic calming measures to reduce the speed of vehicles and improve attractiveness for active modes. It runs parallel to the A38 from Stratford Road connecting to the recently built off road active travel corridor on Harvington Road.

- Due to higher inflation experienced in 2022, resulting in increased scheme cost, OBC stage schemes have been separated into Phase 3 and Phase 4 based on a multi criteria assessment. This approach has been endorsed by the Project Board and the Cabinet on the 8th December 2022. It was also communicated to the DfT in November 2022. Phases 3 and 4 schemes are summarised below. Phase 3 includes the following schemes:

- Six hybrid schemes containing highways capacity and active travel improvements which were included in the OBC submission. These are reworked Schemes A and B and C to F.

- Three active mode improvement schemes, namely Schemes 3, 6 and 9.

- Two local public transport improvement schemes, namely Schemes 7 and 8, which have not changed compared to the OBC stage.

The core schemes within the A38 BREP Phase 3 remained as it is compared to the OBC schemes, therefore WCC believes that the Strategic Dimension of Phase 3 schemes remains robust.

Phase 2 (early delivery Schemes 2a, 2b and 4) and Phase 3 form the overall BREP MRN package and form the basis of this FBC, with Phase 2 that has been delivered using local contribution and Phase 3 to be delivered with local and MRN funding contributions.

Phase 4 includes the following schemes:

- Three highways improvement schemes: Scheme G and the complementary remaining parts of Schemes A and B that have been removed from Phase 3.

- Two active mode improvement schemes, namely Schemes 1 and 5.

The OBC included Phase 4 schemes, but these have now been removed from all aspects of this bid, and will be progressed once alternative funding sources are secured hence will be subject to a separate business case (please see Table 3.4 and Table 3.5 for more details).

- Progress of the designs to detailed design stage and refinement due to road safety audits.
- All assessment work carried out within the FBC includes updates to reflect the changes described above (only Phase 3 components). This includes updates to the strategic modelling, active modes appraisal, noise and air quality assessment, finance and costing information, economic assessment in addition to updates to the Management and Commercial Dimensions. The environment assessment report used for consenting includes Phases 3 and 4 schemes as requested by Worcestershire Regulatory Services and WCC Development Management.
- Updates to reflect further details requested by DfT during the OBC stage review.

1.2 Strategic Dimension

The scheme is a high priority both for WCC and WLEP. The scheme is well developed, has a strong Strategic Dimension, is backed by political support and is included in Worcestershire's Local Transport Plan (LTP4) and the City and Town Centre Investment Programme of WLEP's SEP. The scheme also features in WLEP's 2020-2040 Plan for Growth vision document as one of the three key pieces of physical infrastructure projects. The A38 improvements are also a priority within the Regional Evidence Base, compiled by Midlands Connect.

The A38 corridor performs a range of different functions, including as a link to the Strategic Road Network (SRN), a corridor to bypass Bromsgrove town centre, a distributor road for journeys that have an origin and/or destination in Bromsgrove and a local access route for residents and businesses that have direct frontages on to the corridor. The corridor experiences congestion and delay at key junctions, leading to unreliable journey times. This situation is projected to worsen into the future. To effectively support adopted Local Plans (for Bromsgrove and Redditch District and Borough in particular) and to deliver economic growth, significant improvements are required to key

junctions. In addition, significant enhancements are required to provide for pedestrians, cyclists and public transport users (building on the success of Bromsgrove on Demand (BoD) and aiming to contribute to the wider Demand Responsive Transport (DRT) service that has been launched by WCC recently. Phase 3 of the A38 BREP supports the delivery of circa 5500 homes and 14 Hectares of employment land based on the adopted Local Plans. Subject to the ongoing Bromsgrove Local Plan review, the scheme may further support delivery of additional homes.

This MRN FBC builds upon both the SOC submitted in July 2019 and the OBC submitted in November 2021 to the DfT. Updates have been made to reflect the changes to the scheme, progression of the assessment, appraisal and DfT feedback. In particular, during the transition from SOC to OBC, all traffic modelling data and economic appraisal have been updated, reflecting the development of a Production – Attraction (PA) based model.

The A38 BREP Phase 3 package includes six schemes focussed on junctions providing significant walking and cycling improvements as well as capacity enhancements (notated Schemes A to F) and three schemes focussed on active modes (notated as Schemes 3, 6 and 9, this is in addition to Phase 2 early delivery schemes) and two local public transport enhancements (notated as Schemes 7 and 8). Phase 2 schemes have been delivered early by WCC to take advantage of a local funding opportunity (namely: Schemes 2a, 2b and 4). This FBC presents the case for Phase 3 schemes, and it considers Phase 2 schemes as part of Phase 3' 'Without Scheme' scenario, and as part of local contribution.

Overall, the A38 BREP Phase 3 schemes address the MRN priorities by:

- Reducing congestion – Without improvements, existing congestion at junctions will continue to worsen leading to increased journey time and increased cost to the economy. The traffic modelling shows that in 2040, in the Do-Minimum scenario, junction capacity is exceeded at multiple locations on the corridor and journey times are increased.
- Supporting economic growth and rebalancing – Congestion on the A38 affects the wider economy, restricts labour markets and impacts on the ability of employees to access potential employment. Improvements are required to enable the A38 corridor to function effectively for businesses and workers.
- Supporting housing delivery - The ability to accommodate growth will be impeded without improvements, due to limited capacity on the network. Junction improvements will help enable the network to better cater for planned development and support delivery of the Local Plan requirements.
- Supporting all road users – Opportunities to support mode shift to walking and cycling are currently restricted due to actual and perceived severance caused by the A38, impacting on local trips and those to Bromsgrove Rail Station. Walking and cycling improvements included in this scheme address severance issues by providing better facilities along, across and adjacent to the A38, building on schemes being delivered across Bromsgrove in other programmes. These schemes will improve safety and security for non-motorised users crossing the A38 and in the surrounding area, resulting in a reduced number of collisions and subsequent economic active mode user benefits.
- Supporting the SRN - Congestion affects the strategic role of the A38, delaying traffic that is trying to reach the SRN via M5 junction 4, M5 junction 5 and M42 Junction 1 or using the corridor as a diversionary route, as well as traffic using the corridor to access urban areas and key employment areas south of Birmingham. Improvements to the corridor will provide efficient and reliable access to the M5 via Junction 4 and M42 via Junction 1.

Not delivering significant enhancements to the A38 corridor would mean that the MRN national priorities will not be achieved in the region. The objectives of key policies set out by the WLEPs in

their SEPs, by WCC in the LTP and the District and Borough Council's in the Local Plans, will also not be realised.

The wider A38 corridor benefits from financial contributions from WLEP who allocated £7.5 million of Local Growth Funding to the A38 enhancements in 2017. The first tranche of this funding was used (alongside contributions from Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP) and National Highways' (NH) Growth and Housing Fund to deliver the 'A38 Phase 1' improvements to the junction of the A38 with M5 Junction 4, M42 Junction 1 and Barley Mow Lane. These works are now complete (and are included within the 'without scheme' baseline scenario for this FBC).

More recently, WLEP funding has also been used to deliver Phase 2 'early delivery' schemes, providing walking and cycling enhancements (notated as Schemes 2a, 2b and 4). Phase 2 schemes are integral to the A38 BREP and were delivered ahead of Phase 3 schemes in order to make best use of available local funds. For the purpose of the FBC stage assessment, Phase 2 schemes are included in the 'without scheme' scenario of Phase 3 assessment (i.e. as part of the Do Minimum baseline) reflecting a conservative approach to modelling and benefits calculation. The remaining WLEP funding has funded the development and design of the OBC and FBC stages, for which funding is sought through this MRN bid.

1.3 Finance Dimension

All aspects and information included in the FBC Finance Dimension were subject to updated contactor and non-contractor costs and Phase 3 schemes delivery programmes.

The total investment outturn cost of Phase 3 scheme is [redacted]. The scheme costs are based on the tender returns/preferred contractor prices for the main works contract (for Schemes A to F and Schemes 6 and 8), Infrastructure Engineering Term Contract (IETC) contractor prices (for Schemes 3 and 9) and WCC Public Transport Department' Contractor (for Scheme 7), as such they represent a robust scheme cost reflecting market prices at this final stage of the scheme development. The cost also includes an allowance for Quantified Risk Assessment (QRA). Local contributions are based on S106 contributions of [redacted] with a further local contribution of [redacted] from WLEP. The majority of funding is sought from the DfT.

An additional [redacted] of local contribution (WLEP) was used to deliver Phase 2 "Early Delivery Schemes" of the A38 BREP. This was done because the time period for using the grant funding from the Local Growth Fund Deal 3 was ending in March 2021. WCC made the DfT aware of this outcome in November 2020. The DfT's preferred option was that the local contribution spent to deliver Phase 2 schemes is taken out of the A38 BREP scheme and the remaining scheme is submitted with a 15% local contribution. However, if that was not possible, then DfT requested that the OBC (and subsequently the FBC) should present the full scheme (including Phase 2 elements) and explain the process for delivering the early works. DfT also requested that the Value for Money (VfM) should be presented separately for Phase 3 schemes (Phase 2 included in the Do Minimum scenario), Phase 2 schemes and finally for the combined Phases 2 and 3 schemes, the latter two as sensitivity tests. Thus, in total this means that a local contribution total of [redacted] has been secured for Phase 3 schemes amounting to circa 18% of the total scheme cost, including work that has been delivered to progress the scheme to an FBC stage. Additionally, [redacted] for Monitoring and Evaluation and a further [redacted] for Part 1 Claims is contributed by WCC.

1.4 Economic Dimension

All information, calculations and assessments included in the FBC Economic Dimension were subject to comprehensive updates reflecting the progression of Phase 3 schemes, final designs, strategic traffic modelling, environmental modelling and other assessments detailed in the Economic Dimension and its appendices.

The Economic Dimension demonstrates high VfM for Phase 3 schemes, Phase 2 schemes and Phases 2 and 3 combined.

The A38 BREP Phase 3 is supported by a robust case for change. The scheme's (Phase 3) initial Level 1 Benefit Cost Ratio (BCR) (Transport user benefits) is estimated at 2.31 demonstrating that the scheme provides a 'High VfM' (between 2 and 4) to taxpayers. The Present Value of Benefits (PVB) equates to £66.04M compared against the Present Value of Costs (PVC) of £28.59M. Low and high growth sensitivity tests have been undertaken. The low growth test demonstrated a BCR of 1.78 implying a medium value for money whilst the high growth scenario demonstrated a BCR of 2.80 implying a high value for money.

With the inclusion of the wider economic benefits (Level 2 BCR, that includes induced investment, employment effects and productivity impacts) Phase 3 schemes demonstrate an adjusted BCR of 2.86 which implies a High VfM. The corresponding Level 2 BCR figures for the low and high growth sensitivity tests are 2.21 and 3.46 respectively, implying High VfM for both tests.

Analysis of the combined Phase 2 schemes (Schemes 2a, 2b and 4, also called early delivery schemes) and Phase 3 schemes has also been undertaken. As a standalone package, Phase 2 schemes offered a High VfM (with a BCR of 2.9) to taxpayers. When combined with Phase 3 schemes, a High VfM to taxpayers is anticipated with a BCR estimated at 2.35.

In summary, the A38 BREP scheme offers a High VfM to taxpayers and seeing the extensive sensitivity tests that have been carried out for the scheme the likelihood of achieving the VfM is also high. The scheme supports delivery of circa 5,500 homes and 14 Ha of employment land.

1.5 Commercial Dimension

The A38 BREP Phase 3 has sound commercial footing considering the tender returns received and the identification of preferred contractors. The Commercial Dimension has been subjected to comprehensive updates to reflect the details of the procurement processes that took place during 2022 and the start of 2023. It also illustrates identification of preferred contractors and risk sharing strategies.

The Commercial Dimension also demonstrates that the scheme is deliverable within the timelines, and that WCC and the selected contractors are ready to start the construction activities once the FBC is approved by DfT.

1.6 Management Dimension

All information included in the FBC Management Dimension were subject to comprehensive updates to demonstrate that WCC has the necessary resources and proven expertise to deliver Phase 3 of the A38 BREP in accordance with the programme and budget. By carrying forward the governance structure already in place and successfully used to deliver the A38 BREP Phases 1 and 2, this bid benefits from an established and clear process for assurance and approvals. The project has a clear and achievable programme. In addition, the Management Dimension demonstrates that:

- Likely risks are well understood, reflecting the fact the proposed schemes are at an advanced stage of development.
- In general, the scheme has a good level of support from relevant stakeholders.
- Final consenting is secured, and it reconfirms Permitted Development rights.
- Monitoring and Evaluation plan that addresses DfT comments received in February 2022 is in place.
- Carbon Management Plan is finalised and shared with the identified contractor.
- The identification of the preferred contractors of the main works contract, IETC and public transport scheme, award pending the final DfT approval of the FBC.
- Bromsgrove District Council has agreed to dedicate to WCC the land required for Schemes 3 and 6. Land required for Schemes B and C is expected to be secured by agreement with the relevant landowners, however, WCC has proceeded to make “The Worcestershire County Council A38 Bromsgrove Route Enhancement Programme Compulsory Purchase Order 2023”. The Order was sealed on 2nd March 2023. In accordance with statutory requirements, Notice of the making of the Order was published in a local newspaper (The Bromsgrove Standard) on 3rd March and 10th March 2023.

1.7 In Conclusion

WCC is ready, have the contractors on board and are in a position to start work on delivery as soon as DfT gives the go ahead.

Key extracts from the gateway review also set out:

- *The Review Team finds that the A38 BREP Phase 3 Team is experienced in project delivery and should meet the challenges that present themselves to the project. The team is led by an experienced SRO who is enthusiastic and determined to deliver successfully.*
- *The Full business case (FBC) is comprehensive and is a solid basis with an indicative good BCR of 2.6, which is high VfM. (BCR is now confirmed at 2.3).*

2. Business Case Alignment

The following points demonstrate that the Strategic, Economic, Commercial, Finance and Management Dimensions and the Traffic Modelling chapter are aligned, all updated to reflect the changes that occurred after the OBC submission (detailed in section 3.1.3.2), and how they feed into one another.

- The Strategic Dimension is updated to reflect:
  - The latest local, regional, and wider policies including Levelling Up priorities.
  - Changes to the scheme elements, and progression of designs into detailed design stage and constrains, this includes the phasing of OBC stage schemes into Phase 3 (this FBC) and Phase 4.
  - In spite of phasing the scheme into Phases 3 and 4, the core schemes within Phase 3 FBC package remained as is compared to the OBC schemes, therefore the Strategic Dimension of Phase 3 schemes remain robust.
  - Stakeholders' engagement and letters of support.
  - Environment assessment and consenting.
- The Traffic Modelling chapter is updated reflecting the changes to the scheme elements (addressing the impacts of Phase 3 only) and the progression of designs (informed by the Strategic Dimension), hence, forecasts and highway user impacts are up to date. The modelling approach is consistent to the modelling approach during the OBC stage.
- All information, assessments and calculations included in the Economic Dimension are updated to reflect any changes to the scheme components (Phase 3) and designs (informed by the Strategic Dimension), scheme impacts (informed by the updated traffic modelling, noise, air quality modelling and other environmental and economic assessments carried out within the Economic Dimension). Scheme costs, delivery programme and opening year fed into the Economic Dimension are based on main works tender, IETC and WCC Public Transport Department returns (informed by the Commercial and Finance Dimensions). These updates include:
  - Active modes appraisal and other non-highway user benefits impacts (due to phasing of the scheme and progression of designs).
  - Distributional impacts assessment (reflects new benefits calculations and addresses DfT comments during the OBC stage).
  - TAG worksheet for the environment topics (use of latest forms).
  - Social impacts assessment.
  - Construction impacts (using the final construction programme and traffic management assumptions) and updated whole life costs.
  - Final Value for Money statement and Appraisal Summary Table.
- The Commercial Dimension is updated to reflect the processes and returns of the main works tender, IETC and WCC Public Transport Department returns. Preferred contractors' construction costs, programmes and traffic management assumptions have been reviewed by WCC as part of tender evaluation and have been fed into the relevant FBC Finance, Economic and Management Dimensions.
- The Finance Dimension uses the preferred contractors' construction costs and programmes (output of the Commercial Dimension). Updates are also included in relation to the following:
  - None-contractors (WCC) costs (including sunk, overheads, supervision costs etc).

- Local and S106 contributions.
- Land and part 1 claims.
- Quantified Risk Assessment.
- Inflation calculations based on updated industry wide inflation indices.
- Section 151 chief officer review and sign off.

- The Management Dimension addresses all changes to the governance structure, roles, programme (consistent with Finance and Economic Dimensions), reporting, gateway review, stakeholder engagement, QRA and risk monitoring and sharing strategy, monitoring and evaluation and Carbon Management Plan.

The Business Case Lead, Abhi Bhasin, appointed in 2016 at an early stage of the business case development, will continue to have overall oversight of the whole business case and maintain strategic coherence across it and to support the Senior Responsible Officer (SRO) and the Client Project Manager in all aspects of the business case including coordination with the Project Board, WCC Cabinet and management of communication with stakeholders and the DfT. Abhi is trained and accredited at practitioner level in the HM Treasury's Better Business Cases™ methodology and has a strong understanding of the relevant policy area and its wider strategic context. He has supervised different stages of the development of several business cases for WCC, including the Phase 2 A38 BREP early delivery Schemes 2a, 2b and 4 and the Worcester Southern Link Road Phase 4 (SLR 4).

As the Management Dimension demonstrates, the Project Board comprises officers that hold the responsibility for the delivery of the A38 BREP Phase 3. The Board is well established, having played an active role in developing and securing funding for the Phase 1 schemes and has overseen the delivery of Phase 2 walking and cycling schemes (WLEP funded). Project Board members are from a wide delivery team, and they meet regularly throughout the life of the project, including at key milestones. The board will continue to oversee project delivery and will have a key role in terms of governance, accountability and decision making.

In summary, all FBC elements and technical work are fully aligned reflecting all changes since the OBC submission, and WCC are well positioned to progress with the implementation of the scheme once the FBC is approved by DfT.

2.1 Structure of the FBC Document

Following the Executive Summary and the Business Case Alignment chapters, the FBC document includes the following chapters:

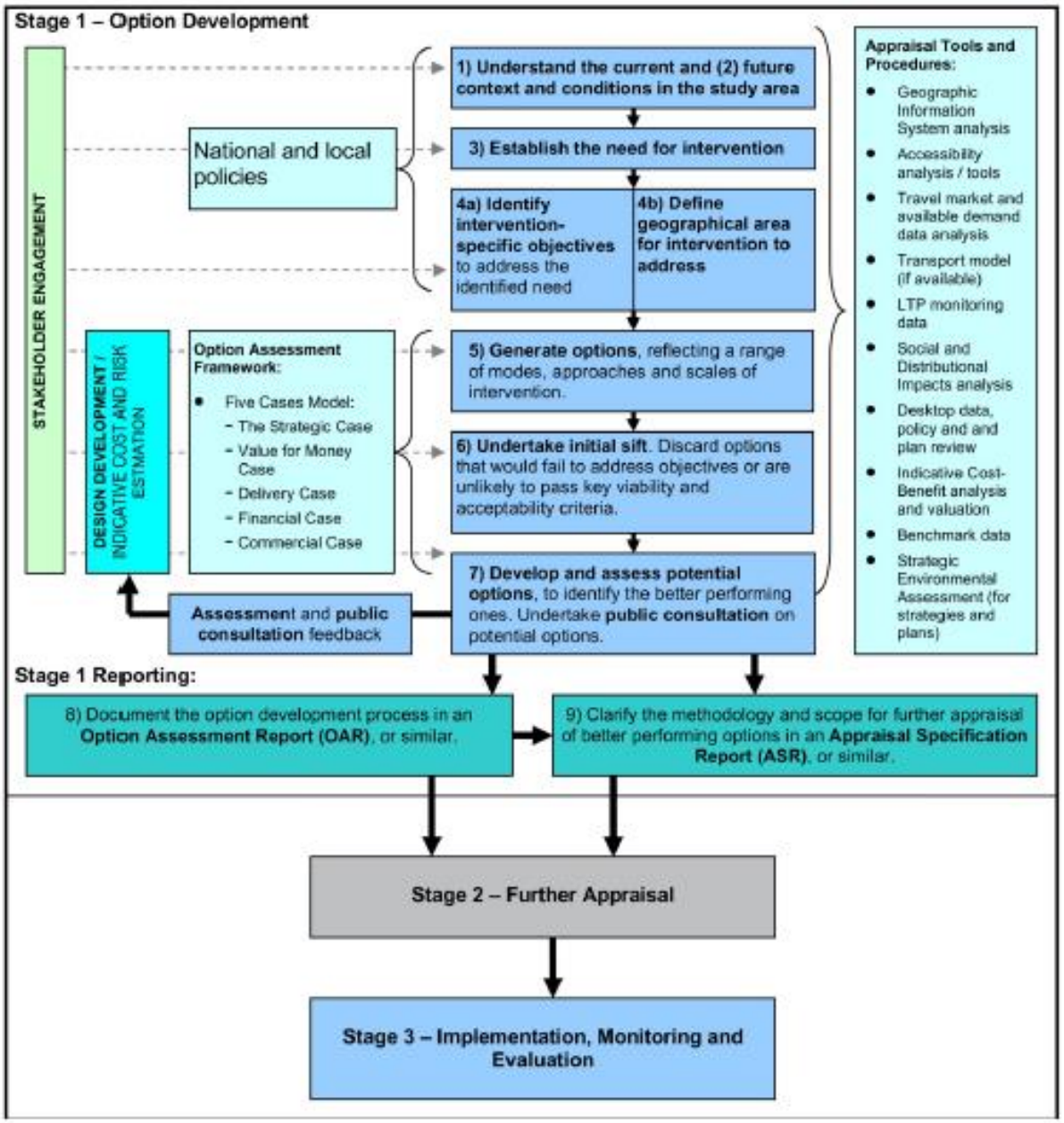
- Chapter 3 sets out the Strategic Dimension.
- Chapter 4 explains the Traffic Modelling used to underpin the FBC appraisal.
- Chapter 5 presents the Economic Dimension.
- Chapter 6 explains the Commercial Dimension.
- Chapter 7 sets out the Finance Dimension.
- Chapter 8 presents the Management Dimension.

3. Strategic Dimension

3.1 Introduction

This section sets out the Strategic Dimension for investment in the A38 Bromsgrove Route Enhancement Programme (BREP). It explains the wider context, presents the rationale for the scheme and makes the case for why the investment is required. It should be read alongside the supporting Options Assessment Report (OAR), included as Appendix S.1 as this provides more comprehensive assessment of the problems and issues on the corridor. The assessment of options in the OAR follows the latest Green Book advice and TAG Guidance on 'The Transport Appraisal Process (TAP)' (May 2018) and specifically addresses Stage 1 tasks, as shown in Figure 3.1. Stage 2 tasks are embedded in all chapters of this FBC.

Figure 3.1- Transport appraisal stages and tasks (reproduced from Transport Analysis Guidance: The Transport Appraisal Process. DfT, May 2018)



The Strategic Dimension deals with Phase 3 of the A38 BREP and it:

- Outlines the role and character of the A38 corridor.
- Provides an overview of the business strategy and policy context.
- Summarises the problems and challenges identified and the justification for intervention.
- Explains the impact/consequences of not changing.
- Outlines the objectives of the A38 BREP Phase 3 schemes and how they align with problems identified and the Major Road Network (MRN) requirements.
- Presents the key measures for success.
- Sets out the scope of the A38 BREP Phase 3 schemes (included within this MRN business case), and the elements which have been separately funded and delivered.
- Identifies constraints and explains the factors (interdependencies) upon which the successful delivery of A38 BREP Phase 3 schemes are dependent.
- Outlines how stakeholders have been involved in the development of the scheme.
- Provides detail on the option identification process.

3.1.1 Background to the A38 Corridor

The A38 in Bromsgrove is an important corridor on the MRN. It acts as a key strategic link, providing access to the Strategic Road Network (SRN), as well as offering an important local function as an eastern bypass to Bromsgrove town centre and providing access to housing, services and employment frontages.

WCC is delivering a major upgrade of the A38 corridor between M5 Junction 4 to the north and the junction of A38 with B4094 Worcester Road to the south, which is approximately 7.5 miles (12 km) long. This Full Business Case (FBC) seeks funding to deliver Phase 3 of the major upgrade of the A38 corridor between M42 Junction 1 to the north and the junction of A38 with B4094 Worcester Road to the south, which is approximately 3.8 miles (6.1 km) long. This corridor forms part of the strategic north south spine through Worcestershire, connecting Worcester, Droitwich, Bromsgrove to Birmingham to the North and Gloucester and Bristol to the south as an alternative to the M5 route. The study area is shown in Figure 3.2.

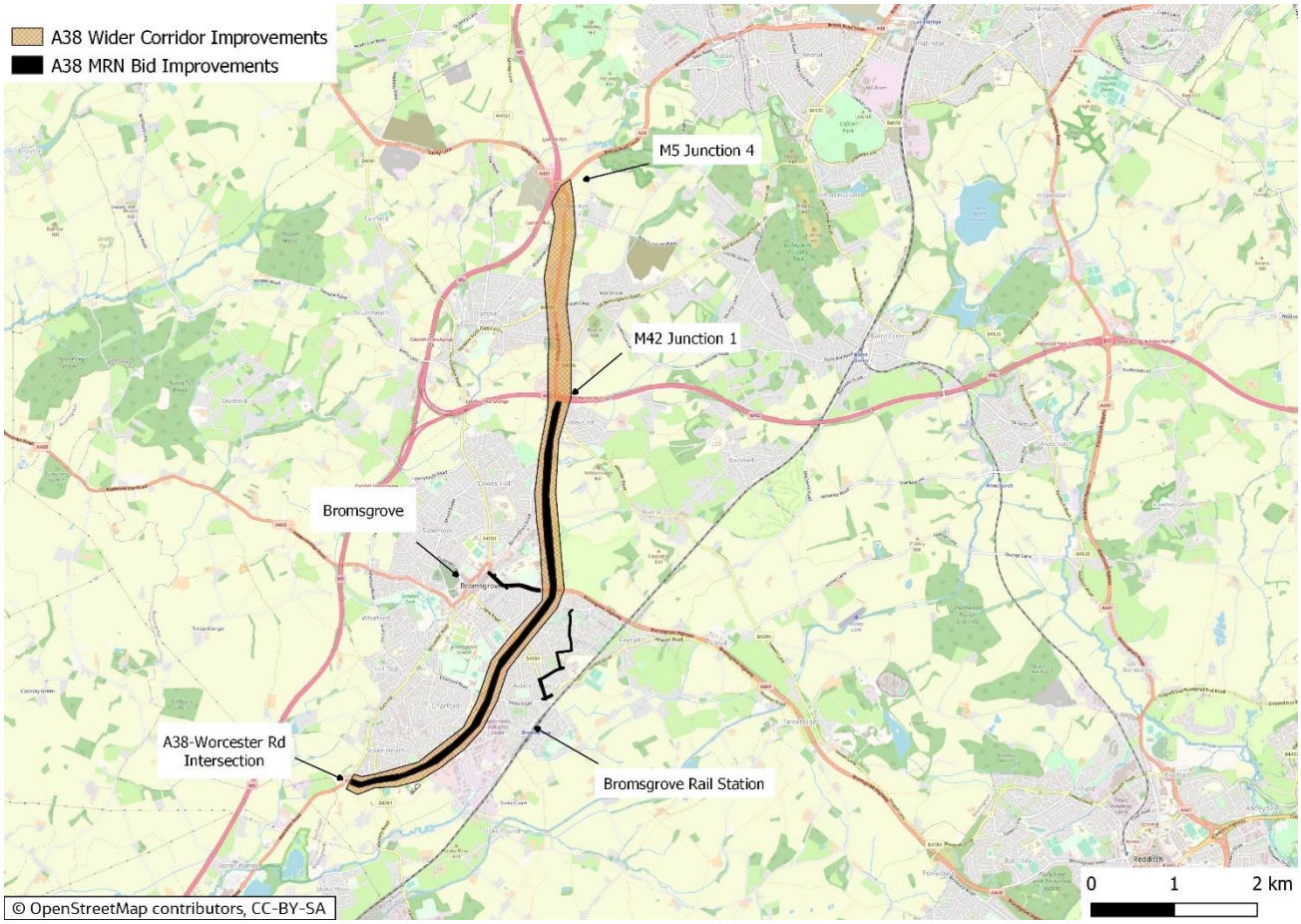
The A38 corridor is a multi-functional route serving a range of users which contributes to the problems and issues discussed later in this chapter. The key characteristics are:

- The route performs a range of different functions, including as a link to the SRN, a corridor to bypass Bromsgrove town centre, a distributor road for journeys that have an origin and/or destination in Bromsgrove and a local access route for residents and businesses that have direct frontages on to the corridor.
- The corridor comprises sections with differing speed limits, levels of frontage and access points in addition to varying levels of pedestrian and cyclist provision. In addition, the driving experience along the route varies due to the differing land uses along sections of the A38 from residential, open field to employment and retail.
- The two features of the A38 corridor outlined above, combined with high levels of car dependency across Bromsgrove, result in substantial congestion. The high level of car dependency across Bromsgrove is an important context for the A38 corridor (as detailed in section 3.3.1.3). There is a need to improve the strategic and local highway network to better cater for car trips, whilst also providing significantly improved facilities for pedestrians and

cyclists across, along and adjacent to the A38 to encourage better take up of sustainable modes.

The A38 Bromsgrove Route Enhancement Programme (BREP – or 'the scheme') comprises a package of schemes delivering targeted improvements to junctions and significant enhancement of facilities for active modes.

Figure 3.2 - Scheme location



3.1.1.1 A38 as a Strategic Link to the SRN

The A38 is an important part of the MRN, providing access to the SRN at the M5 (via Junctions 4 and 5) and the M42 (via Junction 1). This is because there are no west facing slip roads at M42 Junction 1 due to the shortness of the weaving section between junction 1 and M5 Junction 4a, therefore, the A38 is a vital link for Bromsgrove in the network. The A38 is also a motorway diversion route between M5 Junction 4 and 5 and the M42 Junction 1 to M5 Junction 4a.

The A38 is important in providing access to international gateways and High-Speed Rail (HS2) stations for Worcestershire residents at Birmingham Airport and Birmingham Interchange via M42 Junction 1 and Birmingham Curzon Street HS2 Rail Station via M5 Junction 4. Further, if drivers wish to travel north on the M5, the access from Bromsgrove is via M5 Junction 4 for most users, similarly if heading south the A38 provides access to M5 Junction 5.

The A38 also provides an important route for trips around the local Bromsgrove town centre, operating as a distributor route.

3.1.1.2 A38 as a Distributor Road

The A38 corridor supports local car journeys that have an origin and/or destination within Bromsgrove. It also provides access to local shops and services, including supermarkets, employment sites and it also provides access to Bromsgrove Rail Station, situated to the east of the A38.

3.1.1.3 A38 as a Local Access Route for Residents and Businesses

The A38 also acts as the 'front drive' for a range of business and residential properties that are adjacent to the corridor. The A38 interacts with the communities at Stoke Heath, Lickey End and Catshill.

The A38 currently suffers congestion, this situation is projected to worsen in the future as new housing and employment planned for the local area are delivered. To effectively support the future development of Bromsgrove and to deliver economic growth, significant improvements are required to the corridor itself, supported by targeted improvements for walking, cycling and public transport.

3.1.2 Background to the Scheme

WCC is undertaking a project to deliver a series of infrastructure interventions comprising of active mode, public transport and highway schemes that make up the A38 BREP Phase 3. The key objectives of this project are to:

- Reduce congestion and transport costs.
- Maximise the efficiency of the road network.
- Increase journey time reliability.
- Support the delivery of housing and employment growth, as outlined in the adopted Local Plans.
- Improve connectivity for pedestrians and cyclists on and across the A38 corridor.

A corridor-based enhancement to the A38 was identified within the Bromsgrove Transport package works as part of the development of Local Transport Plan 3, and subsequently Local Transport Plan 4 (LTP3 and LTP4). Initial scheme development was undertaken in 2015/2016 to support funding bids made in 2016 to Worcestershire Local Enterprise Partnership (WLEP), Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP) and National Highways (NH, previously called Highways England). WCC has undertaken further scheme development and remains committed to delivering improvements to the A38 corridor.

The wider A38 BREP corridor enhancement is being delivered in four phases, these phases are presented in Figure 3.3 and described below:

- Phase 1 (funded by WLEP, GBSLEP and NH' Growth and Housing Fund (GHF)), provided for capacity upgrades at M5 Junction 4, M42 Junction 1 (completed in 2020/21) and the Barley Mow Lane junction with the A38 (completed in 2019). The works are included in the Do Minimum scenario for the A38 BREP Phase 3, as these have now been completed on site. Phase 1 is not part of the MRN funding.
- Phase 2 comprised of the early delivery elements (also referred to as Schemes 2a, 2b and 4) of the A38 BREP presented at both the SOC and OBC stages. Phase 2 schemes have been delivered early using WLEP local contribution funding to take advantage of the local

funding availability. These works are an important part of the overall A38 BREP scheme, contributing to the improvement of active mode facilities on the corridor.

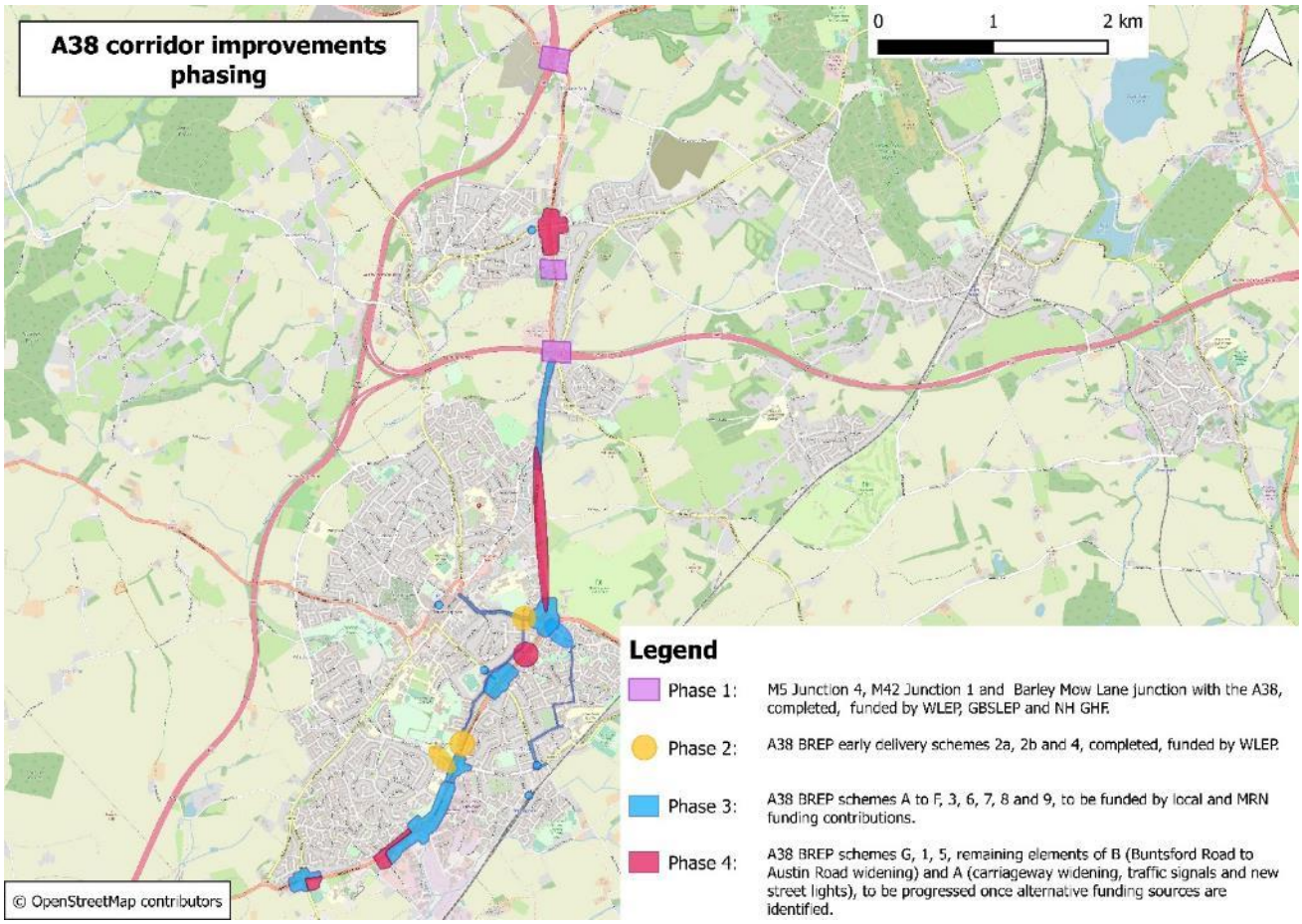
- Scheme 2a: An active travel corridor on the A38 between Charford Road and Harvington Road that includes a 3m wide cycleway and 2m wide segregated pedestrian / cycle facility provision of connection to Harvington Road.
- Scheme 2b: An active travel corridor providing connection between the A38 and Scheme 2A to South Bromsgrove High School, it includes the provision of a 3m wide shared cycle path and footpath.
- Scheme 4 is a signal toucan crossing of A448 to east of Fordhouse Road, to provide connectivity between Blackwood Road (Heart of Worcestershire College) and Regents Park Road and Fordhouse Road, and tie into Scheme E, Scheme 3 and Scheme 9.

Phase 2 schemes have been developed as part of the overall strategic active modes upgrade as part of the A38 BREP package. This FBC will continue adopting the same approach presented in the OBC submission in relation to these schemes: They form part of the Phase 3 Do Minimum scenario, and their economic and financial impacts are reported as a sensitivity test in the Economic Dimension. It should be noted that the Phase 2 package offered a High Value for Money to taxpayers. A copy of the approved WLEP FBC is appended (Appendix S.6).

- Phase 3 includes three active mode improvement schemes (Schemes 3, 6 and 9), two local public transport improvement schemes (Schemes 7 and 8) and six hybrid schemes containing highways capacity and active travel improvements which were included in the OBC submission (Schemes C to F and parts of Schemes A and B). Section 3.1.3.2 below provides more details.
- Phase 4 includes schemes that were originally included in the OBC stage but have now been moved to Phase 4 due to higher inflation experienced in 2022, resulting in increased scheme cost. Phase 4 includes two active mode schemes (Schemes 1 and 5) and one highway improvement schemes (scheme G), in addition to complementary parts of two highway schemes (Schemes A and B) included in Phase 3 above. Phase 4 schemes have been removed from all aspects of this bid and will be progressed once alternative funding sources are secured hence will be subject to a separate business case. Section 3.1.3.2 below provides more details.

Phase 2 and Phase 3 form the overall A38 BREP package, with Phase 2 that has been delivered using local contribution, and Phase 3 to be delivered with local and MRN funding contributions. Section 3.1.3 below presents the progression of this MRN bid through different stages of the business case development and explains the changes and the improvements added or removed to the scheme.

Figure 3.3 – A38 corridor improvement phasing



3.1.3 Overview of this MRN Bid

This MRN FBC seeks funding for a comprehensive package of measures for the A38 corridor which:

- Cater for all modes. The A38 BREP Phase 3 schemes include junction capacity enhancements, walking and cycling provision and localised small-scale measures for prioritising late running buses. These measures help to tackle congestion as well as improve accessibility by non-car modes and reduce the severance effect of the A38.
- Build further on the measures identified in the 2019 SOC and 2021 OBC, reflecting feedback from engagement exercises and the results of procurement and additional refined assessments.
- Build on other recent/ongoing investment in Bromsgrove, notably the Phase 3 schemes complement:
  - The walking and cycling schemes funded via the National Productivity Infrastructure Fund (NPIF) are now fully constructed.
  - The Phase 1 enhancements to the junctions with Barley Mow Lane, M5 Junction 4 and M42 Junction 1, funded by NH, WLEP and GBSLEP.
  - Phase 2 Walking and cycling improvements funded by WLEP as early delivery elements.

- Will deliver a step change in provision for pedestrians and cyclists, providing enhancements to north-south route on/alongside and across the A38 and fundamentally improving active mode provision along the corridor and in the adjacent area.
- Provide improvements to traffic signalling, to improve traffic flow and help improve journey time reliability.
- Provide junction capacity optimised to cater for future traffic conditions, helping to provide improved access to the SRN and address congestion and journey time issues.

The following two paragraphs presents the changes to the scheme before and after the OBC submission in November 2021.

3.1.3.1 Scheme Development Prior to the OBC Submission

At the time of the SOC submission to DfT in 2019, the DfT assessed the SOC recognising its advanced stage of development, however, DfT requested that all future work should replace the Origin – Destination method for determining the 2025 and 2040 forecast year travel patterns with Production – Attraction (PA) model.

Following on from the previous work undertaken at SOC stage, a review of all prior work was undertaken as a means of rebasing the project to a more up to date viewpoint, with consideration of updated policy, guidance and design standards. The OBC submission in November 2021 reflects the progression of the modelling, assessment and appraisal and the development of the design as it stood back then. In particular all traffic modelling data has been updated, reflecting the development of a Production – Attraction (PA) based model. The economic appraisal was also fundamentally enhanced compared to that presented at SOC stage. As part of this update, the following has been undertaken in preparation of the OBC:

- Updating of the traffic model to take into account the DfT comments on the model form. The 2017 Base year model utilised an Origin – Destination method for determining the 2025 and 2040 forecast year travel patterns. For the OBC submission, the model has been converted to a Production – Attraction (PA) model.
- Updating of the active mode provisions to take into account public engagement feedback, Local Transport Note (LTN) 1/20 standards, and best practice up to 2021. The active mode schemes also deliver enhanced linkages to residential areas to support the strategic context in linking the town centre and residential areas to Bromsgrove Rail Station.
- Review of the highway schemes prepared for SOC stage, taking into account public engagement responses, updated Design Manual for Roads and Bridges (DMRB) guidance, LTN 1/20 standards, and the latest modelling information for the 2040 design year.

The following paragraphs present the changes made to the schemes between the SOC and OBC stages and included in the OBC submission.

3.1.3.1.1 Highway Schemes Included in the OBC Submission

The OBC stage included seven highway schemes as described in Table 3.1 and presented in Figure 3.4 below.

The key changes to the highway schemes compared to the SOC stage include:

- General review/progression of the design to reflect the new flows resulted from the model update, minimise land take where possible (such as for Schemes B and C), avoid physical constraints and utilities.

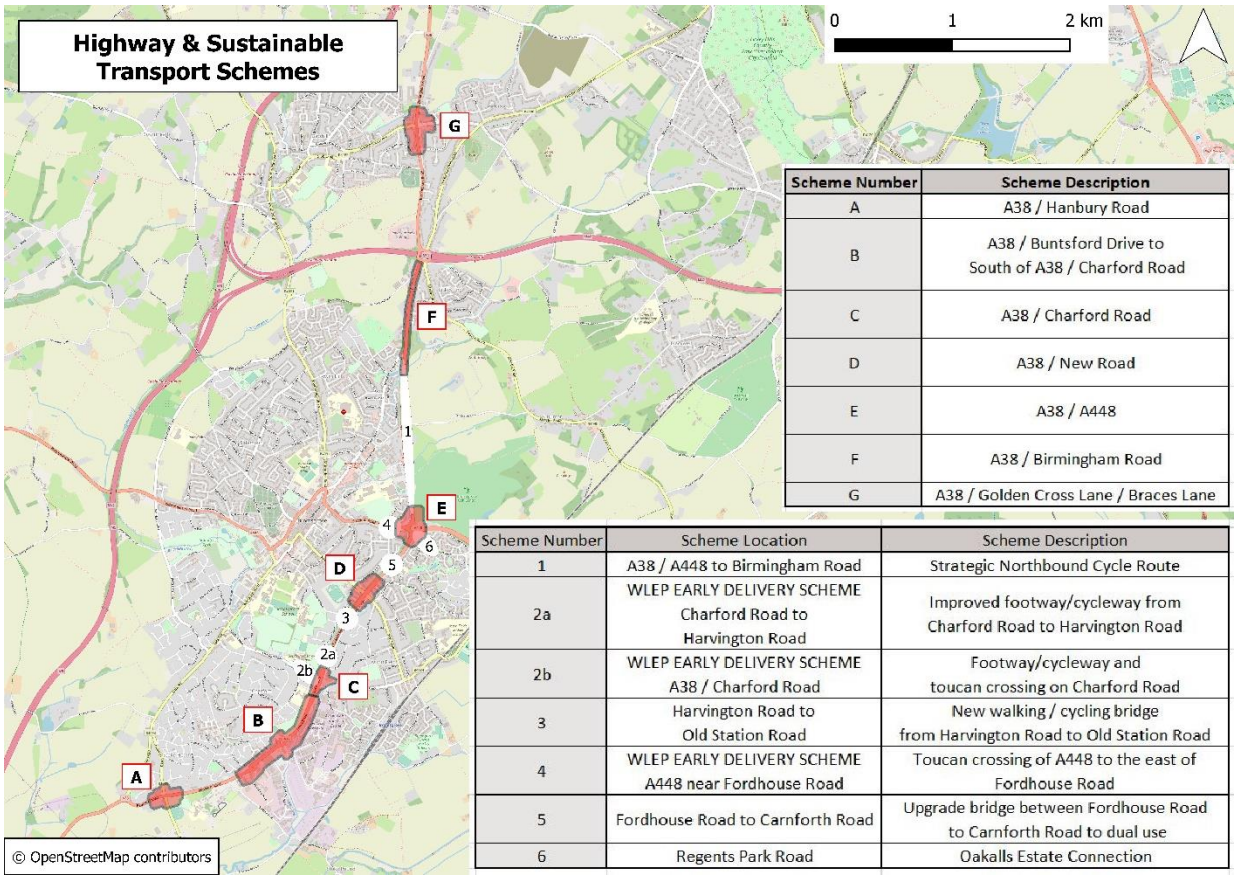
- At SOC stage, 8 schemes were included (A – H). Through the development of the OBC, Schemes F and H are combined into an expanded Scheme F. At SOC stage Schemes F and H were at a very early stage of concept development.
- All SOC stage schemes were reviewed to identify additional opportunities for pedestrians and cyclists. This has result in the addition of pedestrian crossings to various schemes and the inclusion of key provision for pedestrians and cyclists specially within Schemes B and C (as part of the wider vision for a north south parallel cycle route, much of which were included as sustainable Scheme 1 at SOC stage).

Table 3.1 - Highway schemes included in the OBC stage submission

OBC Reference	Scheme location	Description of proposed scheme
A	A38 / Hanbury Road	Provide a longer left turn lane on the Eastern A38 approach. Optimisation of signal timings to provide network control.
B	A38 / Buntsford Drive to south of A38 / Charford Road	Provision of two northbound lanes over approximately 100m on approach to Buntsford Drive roundabout, continuing to A38 / Charford Lane approach. Removal of guard railing at Buntsford Drive roundabout. Reconfigured lane markings on approaches and circulatory at A38 / Sherwood Road / Austin Road junction. New toucan crossings over Sherwood Road and A38 North. Development of Active Travel Corridor Link parallel to A38, providing a 3m wide shared footway/cycleway from Buntsford Drive to Charford Road (Scheme C and Scheme 2), as part of a wider cycle strategy for A38 corridor. Pedestrian / Cyclist linkage to Sherwood Road towards Bromsgrove Rail Station.
C	A38 / Stoke Road / Charford Road	Widening of the existing narrow 60m long two-lane approach and realignment of Charford Road. Widening of Culvert on Stoke Road to facilitate third lane over structure and realign ahead and right turn movement lane to improve access into the left turn lane to the A38 Southbound. Enhance pedestrian crossing widths across A38 corridor to 5m to support volume of pedestrians crossing over the A38 at grade. Provision of 3m wide footway/cycleway connection to link with Scheme B. Upgrade of uncontrolled crossings of Stoke Road (Upgrade to toucan) and Charford Road (Upgraded to pelican). Widen existing parking bays on Charford Road, to facilitate improved exit lane width from A38. Improved footway connection between A38 North and Warwick Avenue. Provision of on-crossing detection equipment at signals.
D	A38 / New Road	Provision of additional southbound traffic lane on A38. Realign Northbound A38 corridor to accommodate changes in southbound direction. Provision of an additional ahead lane from New Road West approach, with associated widening of A38 East exit. Provide new staggered pedestrian crossing on New Road West approach and exit in vicinity of Fordhouse Road and Bant Mill Road. Provision of wider crossing widths to support any future uplift in pedestrian movements. Provision of on-crossing detection equipment at signals. Reconfiguration of signal timings to accommodate separate phases for New Road East and West.
E	A38 / A448	Provision of two additional flare lanes (30 and 85m) on A38 north approach. Provision of a 61m flare lane on A448 East approach. Provision of longer flare lane (100m) on A38 South approach. Provision of 46m flare on A448

OBC Reference	Scheme location	Description of proposed scheme
		West approach. Provision of toucan crossings on A38 South and A448 Stratford Road approaches. Provision of 2 lane exit on A38 South and A448 West. Provision of Pedestrian crossing facilities across A38 North and A448 West arms. Signalisation of both A38 and A448 arms. Provision of cycle connection from A448 West to Regents Park Road, to connect to Schemes 4 and 6). Provision of cycle route from A448 West toucan crossing to A38 North to link to Scheme 7). Provision of MOVA signal control. Revisions to circulatory markings. New footway connection from Scheme 4 on northern side of A448 West to Toucan Crossing by circulatory.
F	A38 / Birmingham Road to south of M42 Junction 1	Realignment of Birmingham Road junction, to accommodate two southbound lanes through junction, with a 3m wide footway on the eastern side of the A38, narrowing to a minimum of 2m in front of properties in front of dwelling curtilages. Provision of on crossing detection to Birmingham Road signals, and pedestrian crossing near Barnsley Hall Drive. Provision of localised widening of kerb lines to accommodate two lanes southbound from M42 J1 to Birmingham Road. School Lane to be converted to left out only, and car left in only, with associated kerb adjustments. Banning of right turn into School Lane. Consideration of lining and signing scheme on Alcester Road between School Lane and Birmingham Road (Cost excluded for Alcester Road scheme). Conversion of existing 40mph section from south of Birmingham Road to North of M42 J1 to 30mph.
G	A38 / Golden Cross Lane / Braces Lane	Provision of two northbound and two southbound ahead movement lanes on A38 corridor through junction. Improve NB approach to 150m two lane, and southbound to be 125m. Conversion of Lane 2 on SB approach to allow ahead movements from current right turn only, with associated exit widening. Improve controlled A38 north crossing point. Relocate bus stop within A38 North merge area to Golden Cross Lane. Remove bus stop lay-by in A38 south direction and relocate. Provide new formal crossing provision on A38 south. Provision of on crossing detectors on crossing points.

Figure 3.4 - Highway and sustainable transport schemes as included in the OBC submission



Scheme Number	Scheme Description
A	A38 / Hanbury Road
B	A38 / Buntsford Drive to South of A38 / Charford Road
C	A38 / Charford Road
D	A38 / New Road
E	A38 / A448
F	A38 / Birmingham Road
G	A38 / Golden Cross Lane / Braces Lane

Scheme Number	Scheme Location	Scheme Description
1	A38 / A448 to Birmingham Road	Strategic Northbound Cycle Route
2a	WLEP EARLY DELIVERY SCHEME Charford Road to Harvington Road	Improved footway/cycleway from Charford Road to Harvington Road
2b	WLEP EARLY DELIVERY SCHEME A38 / Charford Road	Footway/cycleway and toucan crossing on Charford Road
3	Harvington Road to Old Station Road	New walking / cycling bridge from Harvington Road to Old Station Road
4	WLEP EARLY DELIVERY SCHEME A448 near Fordhouse Road	Toucan crossing of A448 to the east of Fordhouse Road
5	Fordhouse Road to Carnforth Road	Upgrade bridge between Fordhouse Road to Carnforth Road to dual use
6	Regents Park Road	Oakalls Estate Connection

3.1.3.1.2 Active Mode Schemes Included in the OBC Submission

The following schemes for active modes made up part of the A38 corridor scheme as included in the OBC submission. The scheme locations and descriptions are detailed in Table 3.2 below and Figure 3.4 above.

During the OBC development stage the active mode schemes have evolved considerably in response to:

- Technical work which has identified additional opportunities to enhance provision for pedestrians and cyclists.
- A design review undertaken following publication of LTN 1/20 standards.
- Feedback received from stakeholders during an engagement exercises undertaken in early 2020 and 2021, the latter presented Schemes 3 and 5 as they stood at that point.

The following are key changes to the scheme as compared to the SOC stage:

- The OBC stage Scheme 1 was a new scheme that has been added in response to engagement feedback which called for additional facilities for pedestrians and cyclists. Overall A38 BREP aims to deliver a high quality north south pedestrian and cycle route parallel to the A38 running from Birmingham Road in the north to Buntsford Drive in the south and covering a distance of around 2.5 miles. Scheme 1 delivers a key part of this route, between Birmingham Road and the A448. Scheme 2a then provides a key section between Harvington Road and Charford Road and Schemes B and C include the remaining sections to Buntsford Drive.
- The SOC stage Scheme 1 was combined with Scheme B junction improvement.

- Scheme 2b was added in response to stakeholder feedback which highlighted the need to provide better links for pedestrians and cyclists between the A38 and Bromsgrove High School. This scheme has been delivered early, using WLEP funding.
- Scheme 6 is a new scheme added after SOC stage in response to engagement feedback.

Table 3.2 – Active mode schemes in the OBC submission

OBC Reference	Scheme Location	Scheme Description
1	Northbound Strategic Cycle Link	Active Travel Corridor Link (Birmingham Road to Buntsford Business Park) - Widening of existing footway to a 4m wide shared cycleway/footway link between the A38/A448 roundabout and Birmingham Road junctions, incorporating a new section between Birmingham Road and Old Burcot Lane. Scheme to include removal of left turn merge at Slideslow Drive Roundabout, and provision of connections to existing access points.
2a*	Charford Road to Harvington Road	Active Travel Corridor – A38 between Buntsford Business Park to Birmingham Road. Scheme provides a 4m shared footway/cycleway along existing footpath between Charford Road and Harvington Road, provision of connection to Harvington Road. Closure of existing cut through to A38, and links with new pedestrian/cyclist bridge structure included as part of Scheme 2B.
2b*	Charford Road to Harvington Road (extension along Charford Road)	Active Travel Corridor - Connection between Scheme 2A and South Bromsgrove High School, to provide a 3m wide shared cycle path and footpath.
3	Harvington Road to Old Station Road	New Walking/Cycling bridge from Harvington Road to Old Station Road, including access ramps and stairs to connect Old Station Road and Harvington Road, to provide missing link in NPIF strategy. Stop up existing at grade crossing point over A38. Reconfigure junction of Old Station Road / Bant Mill Road / Harvington Road, to improve conditions for cyclists and pedestrians to support a north to south parallel route to the A38, and connection to NPIF Route between Town Centre and Station (East to West). Old Station Road/Stonehouse Road/Warwick Avenue junction to be upgraded to provide connection for walking/cycling trips as part of NPIF Route connection.
4*	A448 near Blackwood Road	Signal Toucan Crossing of A448 to east of Fordhouse Road, to provide connectivity between Blackwood Road (Heart of Worcestershire College) and Regents Park Road and Fordhouse Road markings, and tie into Scheme 6.
5	Fordhouse Road to Carnforth Road	Upgrade bridge between Fordhouse Road to Carnforth Road to facilitate cycling, bridge to be widened and parapet heights to be raised. Stairs also to be added on eastern side of A38.
6	Regents Park Road Connection to Oakalls Loop	Provision of a footway/cycleway connection between Scheme 4 and the existing cycle provision within the Oakalls Estate of Bromsgrove, to provide further connectivity from the north and west of Bromsgrove to the station.

**Phase 2 Schemes 2a, 2b and 4 have been constructed as an early delivery scheme, funded by WLEP.*

3.1.3.1.3 Public Transport Schemes Included in the OBC Submission

The SOC stage did not include any specific public transport measures. However, local improvements have been proposed in the OBC stage in the light of recent DfT requirements. The OBC included two local improvement measures for buses to promote the use and the reliability of public transport access Bromsgrove Rail Station and rail services.

Scheme 7 introduced upgrade to 9 bus stops (including provision of physical infrastructure/shelters), the use of smart technology and wind turbine/solar panel powered Real Time Information (RTI) screens, and improvements to wayfinding signage in order to achieve enhanced awareness and confidence in accessing the station. Scheme 7 includes a Smart Interchange Point for 1 stand at Bromsgrove Bus Station and 1 Stand at Bromsgrove Rail Station, recognising the importance of new and innovative Smart Hubs at critical interchange points which would allow connection with the strategic corridor routes, and provide a location for DRT pickup through a booking system that allows full accessibility to all residents.

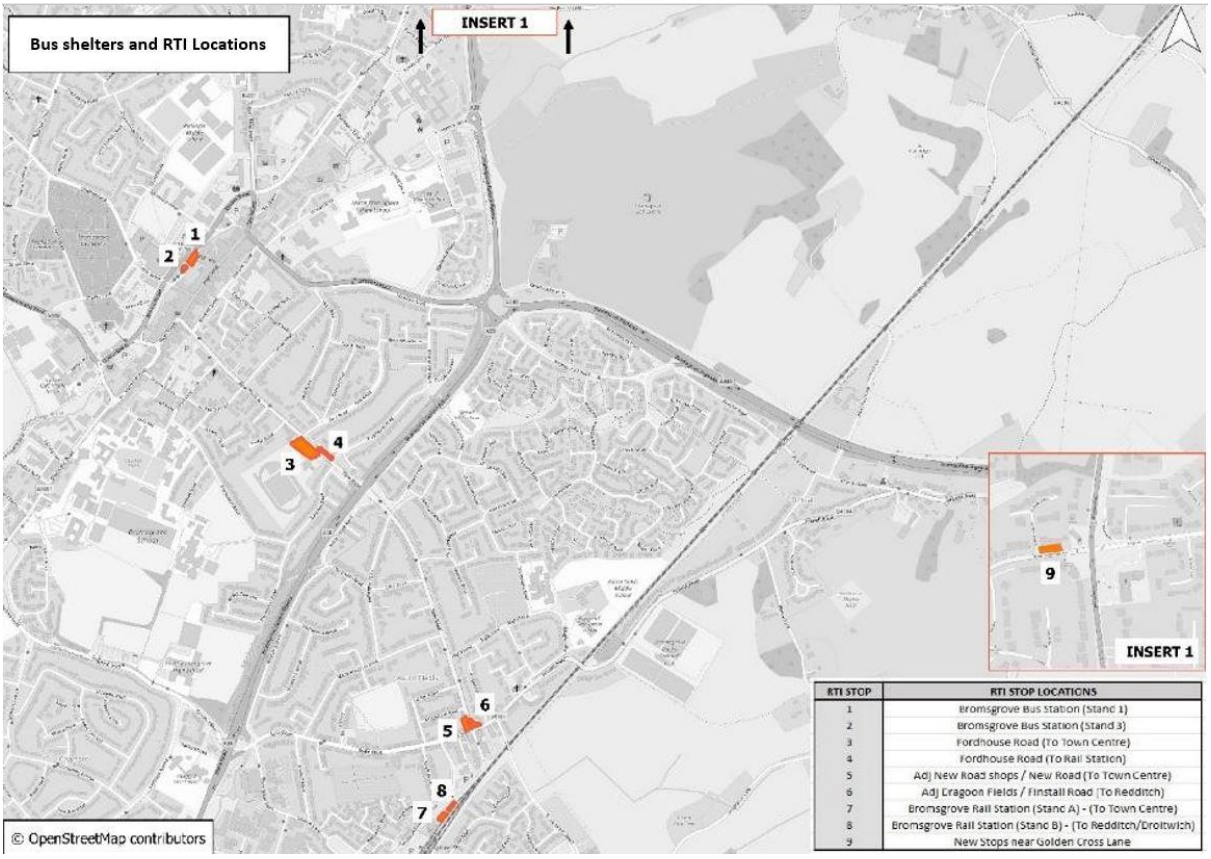
Scheme 7 will be complemented by WCC's initiative on Demand Responsive Transport (DRT) service in Bromsgrove, called Bromsgrove on Demand (BoD) (please refer to section 3.3.1.12 for more details).

Scheme 8 included the provision of select vehicle detection at New Road and Charford Road junctions to support buses in crossing the A38 corridor, on the primary routes between the Town Centre and Bromsgrove Rail Station. Table 3.3 provides further details, while Figure 3.5 presents the locations of Scheme 7 interventions.

Table 3.3 – Public transport schemes in the OBC submission

OBC Reference	Scheme Location	Scheme Description
7	Bus shelters and RTI	Provision of upgrades to bus stops to install additional information on the route between the Town Centre and Rail Station. This allows for 9 bus stop upgrades (including provision of physical infrastructure/shelters), plus wind turbines/solar panels powered RTI screens at Town Centre (Bromsgrove Bus Station), Fordhouse Road (By the Ryland Centre), New Road, Finstall Road (near Dragoon Field), Bromsgrove Station and new stops on Golden Cross Lane (near Marlbrook Crossroad). A Smart Interchange Point will be delivered for 1 stand at Bromsgrove Bus Station and 1 Stand at Bromsgrove Rail Station, allowing connection with the strategic corridor routes, and providing a location for DRT.
8	Public transport select vehicle detection	Provision of select vehicle detection at New Road and Charford Road junctions to support buses in crossing the A38 corridor, on the primary routes between the Town Centre and Bromsgrove Rail Station. Scheme 8 will be delivered at the same time as Schemes C and D.

Figure 3.5 – Scheme 7/ Shelters and RTIS stop locations in the OBC submission



3.1.3.2 Scheme Development Since the OBC Submission

Following the submission of the OBC (November 2021) work has progressed with scheme development. Table 3.4 and Table 3.5 below present the highway and active mode schemes that are included in the FBC stage and provide a comparison against what was included in the OBC submission. Figure 3.6 below also provides an update to the locations of the schemes. There are no changes in the public transport schemes (Schemes 7 and 8).

Changes since the OBC stage submission are summarised below:

<u>Changes to the schemes</u>

- The first change is the replacement of the OBC stage walking/cycling bridge (Scheme 3) from Harvington Road to Old Station Road with the new Scheme 3 active travel corridor enhancements.

  The original Scheme 3 was designed to reduce severance across the A38. It was proposed to build upon the work undertaken as part of the National Productivity Infrastructure Fund (NPIF) Bromsgrove scheme and tackle local severance by providing an active travel corridor between the Bromsgrove Town Centre and Bromsgrove Rail Station (which is key desire line that forms an important part of WCC active travel strategy for Bromsgrove). The original Scheme 3 proposal involved the construction of a new pedestrian/cycle bridge across the A38 from Harvington Road to Old Station Road, which was originally severed as part of construction of the A38 and served as an important link between Aston Fields and Bromsgrove town centre. In order to ensure compliance with LTN 1/20 standards, the bridge design included larger access ramps compared to what was envisaged at SOC Stage, resulting in wider environmental and local concerns, in addition to impacts on the value for money.

The new Scheme 3 aims to tackle the same local severance by providing active travel corridor enhancements between the Bromsgrove Town Centre and Bromsgrove Rail Station.

The new Scheme 3 includes active travel enhancements for pedestrians and cyclists via a combination of segregated cycle routes, new shared cycle/footway facilities, existing facilities and on-road cycling. The route follows New Road, Rigby Lane, Drummond Road, the existing shared facility in Oakalls estate to join Scheme 6, into Scheme E at Oakalls roundabout and then along Stratford Road to the Town Centre.

- The second change is the introduction of a new active mode corridor improvement scheme, namely Scheme 9. Following the OBC submission, an LTN 1/20 compliance assessment was undertaken which highlighted the need for traffic calming measures along the corridor which were not previously envisaged. Therefore, Scheme 9 has been introduced to include the installation of LTN 1/20 compliant traffic calming active modes. It includes active travel enhancements with on- road cycling proposed along Fordhouse Road, Bant Mill Road and Harvington Road including traffic calming measures and a new toucan crossing on New Road.

Phasing of the OBC schemes into Phases 3 and 4

- Due to higher inflation experienced in 2022, resulting in increased scheme cost, OBC schemes (including the new Schemes 3 and 9) have been separated into Phase 3 and Phase 4 based on a multi criteria assessment carried out by WCC that included scoring of the individual schemes based on journey time benefits, safety, deliverability, land acquisition, third party contributions etc (details of this assessment are presented in section 3.4.5.4.2). This approach has been endorsed by the Project Board and the Cabinet on the 8th December 2022. It was also communicated to DfT in November 2022.

  Phase 3 includes the following schemes:

  - Six hybrid schemes containing highway capacity and active travel improvements which were included in the OBC submission. These are Schemes: C to F and parts of Schemes A and B (only limited elements of the latter two schemes have been moved to Phase 4 as described below).

  - Three active mode improvement schemes, namely Schemes 3, 6 and 9.

  - Two local public transport improvement schemes which have not changed compared to the OBC stage (please refer to section 3.1.3.1.3 for details). Local public transport improvements, notated as Scheme 7 (Provision of upgrades to 9 bus stops including provision of physical infrastructure/shelters and wind turbines/solar panels powered Real time information (RTI) screens) and Scheme 8 (the provision of select vehicle detection at New Road and Charford Road junctions to support buses in crossing the A38 corridor, on the primary routes between the Town Centre and Bromsgrove Rail Station). The latter scheme will be delivered at the same time as Schemes C and D, hence not discussed separately within the FBC. The two public transport elements aim to build on the success of BoD (which was a pilot DRT project) and aim to contribute to the success of the wider DRT that has been launched by WCC recently.

  Phase 2 (early delivery Schemes 2a, 2b and 4) and Phase 3 form the overall A38 BREP package i.e. the basis of this FBC, with Phase 2 delivered using local contributions, and Phase 3 to be delivered with local and MRN funding contributions.

  Phase 4 includes the following schemes:

  - Three highway improvement schemes: Scheme G and the complementary remaining parts of Schemes A and B that have been removed from Phase 3:

- Phase 4 elements of Scheme A: Carriageway widening and new footway construction along Redditch Road, ramp down to existing playground and changes to street lighting and traffic signals.

- Phase 4 elements of Scheme B: A38 widening over approximately 100m of highway widening on approach to Buntsford Drive roundabout up to the A38/ Sherwood Road Roundabout.

- Two active mode improvement schemes, namely Schemes 1 and 5.

Phase 4 schemes have been removed from all aspects of this bid and will be progressed once alternative funding sources are secured hence will be subject to a separate business case.

Progression of technical work and assessment

Technical work has developed since the approval of the OBC, primarily related to the elements outlined below:

- Progression of the designs to detailed design stage and refinement due to road safety audits.
- All assessment work carried out within the FBC includes updates to reflect the changes described above i.e. include only Phase 3 components. These updates include (but not limited to):
  - Updates to the traffic modelling to reflect the removal of Scheme G, the parts of schemes A and B moved to Phase 4, in addition to any changes in relation to the active mode improvements that might impact the traffic transport model results such as the new Schemes 3 and 9.
  - Updates to the active modes appraisal and other non-highway user benefits impacts as a result of removing Schemes 1, 5 and G from and the inclusion of the new Schemes 3 and 9.
  - Updates to environment assessment and consenting: The environment assessment report used for consenting includes Phases 3 and 4 schemes as requested by Worcestershire Regulatory Services and WCC Development Management.
  - Updates to noise and air quality modelling using the latest traffic modelling results, considering only Phase 3 schemes.
  - Updates to the finance information including costs information, local and S106 contributions, land and part 1 claims, Quantified Risk Assessment (QRA), inflation calculations based on the final delivery programme…etc considering only Phase 3 schemes.
  - A comprehensive update to the Economic Dimension to reflect Phase 3 schemes only including updates to opening year and construction and future maintenance impacts.
  - Updates to the Management and Commercial Dimensions considering Phase 3 elements and reflecting any changes in the project structure and roles, programme, reporting, gateway review, stakeholder engagement, QRA, monitoring and evaluation, Carbon Management Plan and the process and results of the procurement.
- Updates to reflect further details requested by DfT during the OBC stage review.

The overall approach to modelling and assessment is consistent with the approach adopted for the OBC submission.

Table 3.4 – Changes to the hybrid schemes containing highways capacity and active travel improvements included in the FBC stage compared to the OBC stage

Ref.	Scheme location	OBC Description of proposed scheme	FBC Description of proposed scheme (phase 3)	Change from the OBC stage
A	A38 / Hanbury Road	Provide a longer left turn lane on the Eastern A38 approach. Optimisation of signal timings to provide network control.	Provide a longer left turn lane on the Eastern A38 approach, undertaking using white lining and carriageway surfacing, within existing kerb line.	Removal of carriageway widening and new footway construction along Redditch Road. Removal of ramp down to existing playground. Changes to street lighting and traffic signals have been omitted (part of Phase 4).
B	A38 / Buntsford Drive to south of A38 / Charford Road	Provision of two northbound lanes over approximately 100m on approach to Buntsford Drive roundabout, continuing to A38 / Charford Lane approach. Removal of guard railing at Buntsford Drive roundabout. Reconfigured lane markings on approaches and circulatory at A38 / Sherwood Road / Austin Road junction. New toucan crossings over Sherwood Road and A38 North. Development of Active Travel Corridor Link parallel to A38, providing a 3m wide shared footway/cycleway from Buntsford Drive to Charford Road (Scheme C and Scheme 2), as part of a wider cycle strategy for A38 corridor. Pedestrian / Cyclist linkage to Sherwood Road towards Bromsgrove Rail Station.	Provision of an additional northbound traffic lanes from A38/ Sherwood Road/Austin Road Roundabout to A38 / Charford Lane approach. New toucan crossings over Sherwood Road and A38 North. Development of Active Travel Corridor Link parallel to A38, providing a 3m wide shared footway/cycleway from Buntsford Drive Sherwood Road and a segregated pedestrian / cycle route on the east side of the A38 between Sherwood Road to Charford Road (Scheme C and Scheme 2), as part of a wider cycle strategy for A38 corridor. Pedestrian / Cyclist linkage to Sherwood Road towards Bromsgrove Rail Station. Additional provision of an upgraded footway on the west side of A38.	Removal of A38 widening over approximately 100m of highway widening on approach to Buntsford Drive roundabout up to the A38/ Sherwood Road Roundabout (part of Phase 4). Inclusion of acoustic barrier.
C	A38 / Stoke Road / Charford Road	Widening of the existing narrow 60m long two-lane approach and realignment of Charford Road. Widening of Culvert on Stoke Road to facilitate third lane over structure and realign ahead and right turn movement lane to improve access into the left turn lane to the A38 Southbound.	Widening of the existing narrow 60m long two-lane approach and realignment of Charford Road. Widening of Culvert on Stoke Road to facilitate third lane over structure and realign ahead and right turn movement lane to improve access into the	Inclusion of an 81m long 1.5m high gabion basket wall along the Brook Retail Park car park to the south of the scheme. Inclusion of acoustic barrier.

Ref.	Scheme location	OBC Description of proposed scheme	FBC Description of proposed scheme (phase 3)	Change from the OBC stage
		Enhance pedestrian crossing widths across A38 corridor to 5m to support volume of pedestrians crossing over the A38 at grade. Provision of 3m wide footway/cycleway connection to link with Scheme B. Upgrade of uncontrolled crossings of Stoke Road (Upgrade to toucan) and Charford Road (Upgraded to pelican). Widen existing parking bays on Charford Road, to facilitate improved exit lane width from A38. Improved footway connection between A38 North and Warwick Avenue. Provision of on-crossing detection equipment at signals.	left turn lane to the A38 Southbound. Enhance pedestrian crossing widths across A38 corridor to 5m to support volume of pedestrians crossing over the A38 at grade. Provision of 4m wide footway/cycleway connection to link with Scheme B. Upgrade of uncontrolled crossings of Stoke Road (Upgrade to toucan) and Charford Road (Upgraded to pelican). Widen existing parking bays on Charford Road, to facilitate improved exit lane width from A38. Improved footway connection between A38 North and Warwick Avenue. Provision of on-crossing detection equipment at signals.	
D	A38 / New Road	Provision of additional southbound traffic lane on A38. Realign Northbound A38 corridor to accommodate changes in southbound direction. Provision of an additional ahead lane from New Road West approach, with associated widening of A38 East exit. Provide new staggered pedestrian crossing on New Road West approach and exit in vicinity of Fordhouse Road and Bant Mill Road. Provision of wider crossing widths to support any future uplift in pedestrian movements. Provision of on-crossing detection equipment at signals. Reconfiguration of signal timings to accommodate separate phases for New Road East and West.	Provision of additional southbound traffic lane on A38. Realign Northbound A38 corridor to accommodate changes in southbound direction. Provision of an additional ahead lane from New Road West approach, with associated widening of A38 East exit. Provide new staggered pedestrian crossing on New Road West approach and exit in vicinity of Fordhouse Road and Bant Mill Road. Provision of wider crossing widths to support any future uplift in pedestrian movements. Provision of on-crossing detection equipment at signals. Reconfiguration of signal timings to accommodate separate phases for New Road East and West.	Removal of the pedestrian crossing on New Road (west) as it is being incorporated into Scheme 9. Inclusion of acoustic barrier.
E	A38 / A448 (Oakalls Roundabout)	Provision of two additional flare lanes (30 and 85m) on A38 north approach. Provision of a 61m flare lane on A448 East approach. Provision of	Provision of two additional flare lanes (30 and 85m) on A38 north approach. Provision of a 61m flare lane on A448 East approach.	Carriageway widening to allow for the inclusion of an additional circulatory lane and additional

Ref.	Scheme location	OBC Description of proposed scheme	FBC Description of proposed scheme (phase 3)	Change from the OBC stage
		longer flare lane (100m) on A38 South approach. Provision of 46m flare on A448 West approach. Provision of toucan crossings on A38 South and A448 Stratford Road approaches. Provision of 2 lane exit on A38 South and A448 West. Provision of Pedestrian crossing facilities across A38 North and A448 West arms. Signalisation of both A38 and A448 arms. Provision of cycle connection from A448 West to Regents Park Road, to connect to Schemes 4 and 6). Provision of cycle route from A448 West toucan crossing to A38 North to link to Scheme 7). Provision of MOVA signal control. Revisions to circulatory markings. New footway connection from Scheme 4 on northern side of A448 West to Toucan Crossing by circulatory.	Provision of longer flare lane (100m) on A38 South approach. Provision of 46m flare on A448 West approach. Provision of toucan crossings on A38 South and A448 Stratford Road approaches. Provision of 2 lane exit on A38 South and A448 West. Provision of Pedestrian crossing facilities across A38 North and A448 West arms. Signalisation of both A38 and A448 arms. Provision of cycle connection from A448 West to Regents Park Road, to connect to Schemes 4 and 6). Provision of cycle route from A448 West toucan crossing to A38 North to link to Scheme 7). Provision of MOVA signal control. Provision of an extra exit lane westbound on the A448 Stafford Road. Inclusion of an additional circulatory lane. New footway connection from Scheme 4 on northern side of A448 West to Toucan Crossing by circulatory.	west bound lane on the A448 exit. Inclusion of acoustic barrier
F	A38 / Birmingham Road to south of M42 Junction 1	Realignment of Birmingham Road junction, to accommodate two southbound lanes through junction, with a 3m wide footway on the eastern side of the A38, narrowing to a minimum of 2m in front of properties in front of dwelling curtilages. Provision of on crossing detection to Birmingham Road signals, and pedestrian crossing near Barnsley Hall Drive. Provision of localised widening of kerb lines to accommodate two lanes southbound from M42 J1 to Birmingham Road. School Lane to be converted to left out only, and car left in only, with associated kerb adjustments. Banning of right turn into School Lane.	Realignment of Birmingham Road junction, to accommodate two southbound lanes through junction, with a 3m wide footway on the eastern side of the A38, narrowing to a minimum of 2m in front of properties in front of dwelling curtilages. Provision of on crossing detection to Birmingham Road signals, and pedestrian crossing near Barnsley Hall Drive. Provision of localised widening of kerb lines to accommodate two lanes southbound from M42 J1 to Birmingham Road. School Lane to be converted to left out only, and car left in	Inclusion of Live site Cameras and Zone site cameras.

Ref.	Scheme location	OBC Description of proposed scheme	FBC Description of proposed scheme (phase 3)	Change from the OBC stage
		Consideration of lining and signing scheme on Alcester Road between School Lane and Birmingham Road (Cost excluded for Alcester Road scheme). Conversion of existing 40mph section from south of Birmingham Road to North of M42 J1 to 30mph.	only, with associated kerb adjustments. Banning of right turn into School Lane. Consideration of lining and signing scheme on Alcester Road between School Lane and Birmingham Road (Cost excluded for Alcester Road scheme). Conversion of existing 40mph section from south of Birmingham Road to North of M42 J1 to 30mph.	
G	A38 / Golden Cross Lane / Braces Lane	Provision of two northbound and two southbound ahead movement lanes on A38 corridor through junction. Improve NB approach to 150m two lane, and southbound to be 125m. Conversion of Lane 2 on SB approach to allow ahead movements from current right turn only, with associated exit widening. Improve controlled A38 north crossing point. Relocate bus stop within A38 North merge area to Golden Cross Lane. Remove bus stop lay-by in A38 south direction and relocate. Provide new formal crossing provision on A38 south. Provision of on crossing detectors on crossing points.	Not included in the FBC.	This scheme has been moved to Phase 4.

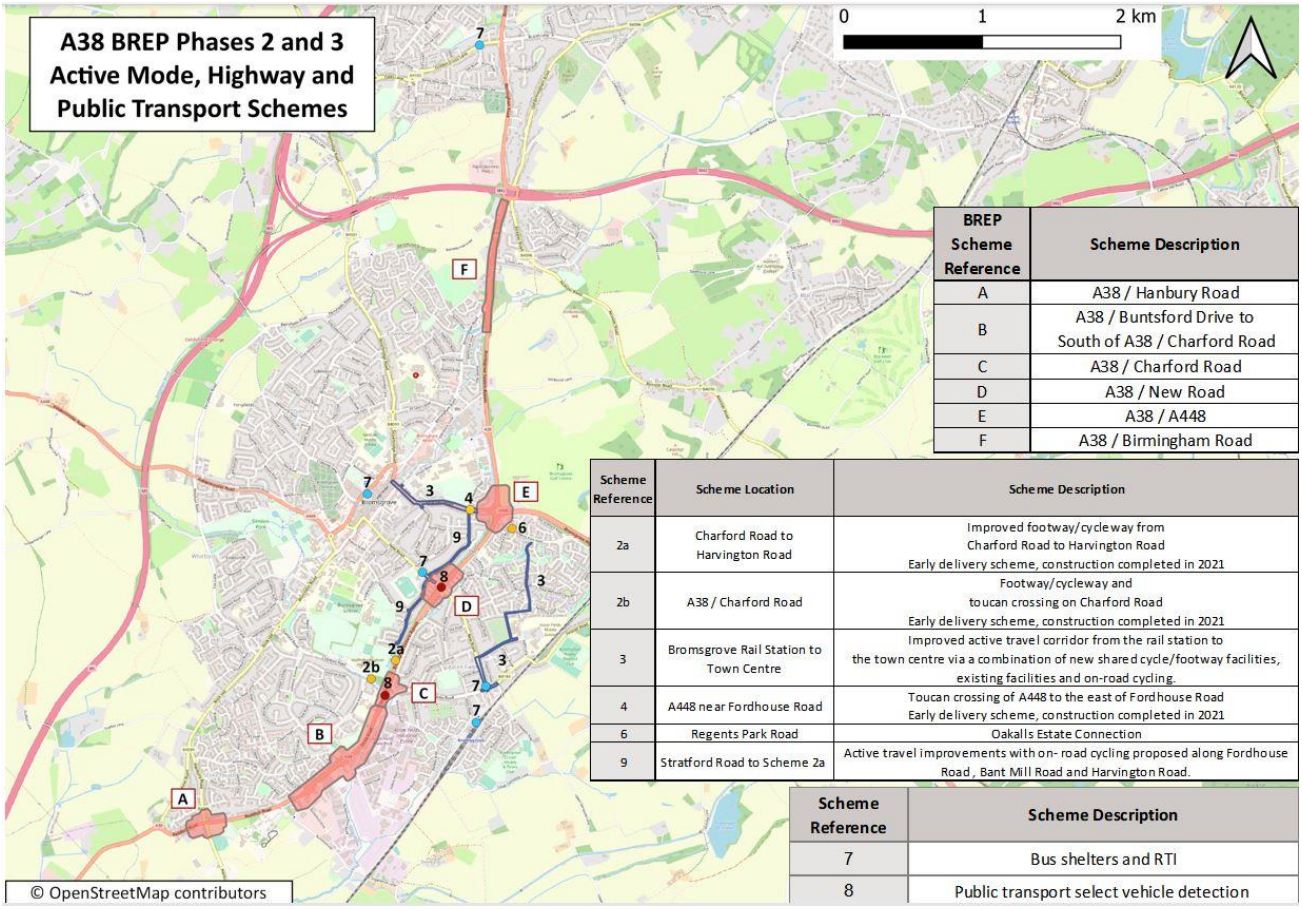
Table 3.5 – Changes to active mode schemes included in the FBC stage compared to the OBC stage

Ref.	Scheme Location	OBC Description of proposed scheme	FBC Description of proposed scheme	Change from the OBC stage
1	Northbound Strategic Cycle Link	Active Travel Corridor Link (Birmingham Road to Bunstsford Business Park) - Widening of existing footway to a 4m wide shared cycleway/footway link between the A38/A448 roundabout and Birmingham Road junctions, incorporating a new section between Birmingham Road and Old Burcot Lane. Scheme to include removal of left turn merge at Slideslow Drive Roundabout, and provision of connections to existing access points.	Not included in the FBC.	This scheme has been moved to Phase 4.
2a*	Charford Road to Harvington Road	Active Travel Corridor – A38 between Charford Road and Harvington Road a 3m wide cycleway and 2m wide segregated pedestrian / cycle facility provision of connection to Harvington Road.	No change.	No change, already delivered.
2b*	Charford Road to Harvington Road (extension along Charford Road)	Active Travel Corridor - Connection between the A38 and Scheme 2A to South Bromsgrove High School, to provide a 3m wide shared cycle path and footpath.	No change.	No change, already delivered.
3	Bromsgrove Train Station to Town Centre	New Walking/Cycling bridge from Harvington Road to Old Station Road, including access ramps and stairs to connect Old Station Road and Harvington Road, to provide missing link in NPIF strategy. Stop up existing at grade crossing point over A38. Reconfigure junction of Old Station Road / Bant Mill Road / Harvington Road, to improve conditions for cyclists and pedestrians to support a north to south parallel route to the A38, and connection to NPIF Route between Town Centre and Station (East to West). Old Station Road/Stonehouse Road/Warwick Avenue junction	Active Travel Corridor for pedestrians and cyclists from the train station to the town centre via a combination of segregated cycle routes, new shared cycle/footway facilities, existing facilities and on-road cycling. The route follows New Road, Rigby Lane, Drummond Road, the existing shared facility in Oakalls estate to join Scheme 6, into Scheme E at Oakalls roundabout and then along Stratford Road to the Town Centre.	The OBC Scheme 3 bridge from Harvington Road to Old Station Road has been replaced by the new Scheme 3.

Ref.	Scheme Location	OBC Description of proposed scheme	FBC Description of proposed scheme	Change from the OBC stage
		to be upgraded to provide connection for walking/cycling trips as part of NPIF Route connection.		
4*	A448 near Blackwood Road	Signal Toucan Crossing of A448 to east of Fordhouse Road, to provide connectivity between Blackwood Road (Heart of Worcestershire College) and Regents Park Road and Fordhouse Road markings, and tie into Scheme E, Schemes 3 and 9.	No change.	No change, already delivered.
5	Fordhouse Road to Carnforth Road	Upgrade bridge between Fordhouse Road to Carnforth Road to facilitate cycling, bridge to be widened and parapet heights to be raised. Stairs also to be added on eastern side of A38. Crossing on Fordhouse Road to be added.	Not included in the FBC.	This scheme has been moved to Phase 4.
6	Regents Park Road Connection to Oakalls Loop	Provision of a footway/cycleway connection between Scheme E and the existing cycle provision within the Oakalls Estate of Bromsgrove, to provide further connectivity from the north and west of Bromsgrove to the station.	No change	No change
9	Stratford Road to Scheme 2a		Active Travel Corridor with on- road cycling proposed along Fordhouse Road, Bant Mill Road and Harvington Road including traffic calming measures and a new toucan crossing on New Road.	A new scheme that was not included in the OBC was required to bring the infrastructure up to LTN 1/20 standards.

**Phase 2 Schemes 2a, 2b and 4 have been constructed as an early delivery scheme, funded by WLEP.*

Figure 3.6 – Highway, sustainable transport and public transport schemes included in the FBC stage – (Phases 2 and 3)



BREP Scheme Reference	Scheme Description
A	A38 / Hanbury Road
B	A38 / Buntsford Drive to South of A38 / Charford Road
C	A38 / Charford Road
D	A38 / New Road
E	A38 / A448
F	A38 / Birmingham Road

Scheme Reference	Scheme Location	Scheme Description
2a	Charford Road to Harvington Road	Improved footway/cycleway from Charford Road to Harvington Road Early delivery scheme, construction completed in 2021
2b	A38 / Charford Road	Footway/cycleway and toucan crossing on Charford Road Early delivery scheme, construction completed in 2021
3	Bromsgrove Rail Station to Town Centre	Improved active travel corridor from the rail station to the town centre via a combination of new shared cycle/footway facilities, existing facilities and on-road cycling.
4	A448 near Fordhouse Road	Toucan crossing of A448 to the east of Fordhouse Road Early delivery scheme, construction completed in 2021
6	Regents Park Road	Oakalls Estate Connection
9	Stratford Road to Scheme 2a	Active travel improvements with on- road cycling proposed along Fordhouse Road , Bant Mill Road and Harvington Road.

Scheme Reference	Scheme Description
7	Bus shelters and RTI
8	Public transport select vehicle detection

The sections above present the changes to the scheme components carried out during different stages of the business development. The rest of the document present updated Strategic Dimension reflecting Phase 3 schemes.

3.2 Strategic Context

The A38 BREP Phase 3 aligns closely with the overall aspirations of the LEPs, WCC and Bromsgrove District Council, as well as Redditch Borough Council. As the scheme has been under development for some time it is directly referenced in many of the key local policy documents including the LTP. It also supports the Governments national priorities and the Midlands Connect Strategy for the region.

A detailed review of the policy context is included in the OAR, which is included as Appendix S.1. This section of the Strategic Dimension provides an overview of the overall policy context within which this scheme is situated. The main policies and strategies considered are shown in Figure 3.7.

Figure 3.7 – Policy context (key documents)

3.2.1 Strategic/National Policy Context

Table 3.6 highlights the national level strategic policy context, within which the A38 BREP Phase 3 has been developed. The scheme aligns closely with the objectives of the DfT's MRN programme and wider policy.

Table 3.6 – Strategic/national policy context

Policy/strategy	Relevance/key ambitions	Contribution of A38 BREP Phase 3 scheme (compared to a future no intervention scenario)
National Planning Policy Framework (NPPF) (2021)	The focus of the NPPF is to encourage sustainable developments, which meet economic, social and environmental objectives. This includes development which helps build a strong, responsive and competitive economy as well as strong vibrant and healthy communities, whilst also protecting and enhancing natural and built environments.	The scheme will help to meet the NPPF's policy of promoting sustainable transport, by promoting walking and cycling and facilitating trips via these modes. Additionally, the scheme will contribute towards the NPPF policy of building a strong, competitive economy by improving the performance and reliability of the MRN.
DfT Single Department Plan (2019)	DfT's focus is on putting passengers and road users at the heart of the transport system, both in delivering the day-to-day operations and also when making longer-term policy and investment decisions. The plan supports jobs, enables business growth, and brings the country closer together.	The scheme will help to meet the DfT's wider department vision by improving efficiency on the A38 corridor, supporting future growth and adoption of active travel modes.
DfT Transport Investment Strategy (2017) - Moving Britain Ahead	A key aim of the DfT Transport Investment Strategy is to create a more reliable, less congested and better-connected transport network.	The existing and predicted future conditions on the A38 corridor are contrary to this aim as the current network is unreliable and congested. The scheme will reduce congestion and improve reliability on the SRN.
DfT MRN programme (2018)	Recognises the key roles that routes such as the A38 play in the wider Local Authority network and in linking to the SRN. Promotes consideration of all road users.	Junction improvements will reduce delay on the A38 corridor and improve journey times onto the SRN. The scheme includes key improvements for pedestrians and cyclists. The scheme meets the objectives of the MRN fund.
DfT Outcome Delivery Plan (2021-2022)	The Delivery Plan sets out how DfT will deliver its priority outcomes. These priority outcomes include improving connectivity across the UK and growing the economy by enhancing the transport network, on time and on budget. Other priority outcomes aim to tackle climate change and improve air quality by decarbonising transport, and finally to build confidence in the transport network as the country recovers from COVID-19 and improve transport users' experience, ensuring that the	The scheme will improve the experience of road users, thereby helping to build confidence in the transport network and improve transport users' experience. It improves connectivity and journey times on the MRN, contributing to the economy. Improved active mode infrastructure implemented as part of the scheme will contribute to the priority 'tackle climate change and improve air quality by decarbonising transport'.

Policy/strategy	Relevance/key ambitions	Contribution of A38 BREP Phase 3 scheme (compared to a future no intervention scenario)
	network is safe, reliable, and inclusive.	
DfT Cycling and Walking Investment Strategy (July 2020)	Outlines a clear ambition to make cycling and walking the natural choices for short journeys or as part of a longer journey with supporting objectives to increase cycling and walking levels. Commitments in the strategy include building extensive new protected cycle routes in towns and cities and setting higher standards for cycling infrastructure.	The scheme has evolved through different stages of the business case development to include additional facilities for walking and cycling, aimed at reducing the severance effect of the A38 and ensuring that a high-quality north-south route is provided along/adjacent to the corridor. The incorporation of these measures as an integral part of the overall package is in line with the strategy and will contribute to the Government's wider ambitions for walking and cycling.
DfT Second Cycling and Walking Investment Strategy (2022)	The key ambition of the strategy is that walking, wheeling and cycling are natural choices for shorter journeys or as part of a longer journey. The ambition is to boost overall levels of walking, wheeling and cycling across England whilst targeting investment to enable more active mode use in towns and cities. Investment will focus on increasing safety, maximising impacts on wider government objectives and be fully integrated into wider transport and growth plans.	The scheme will improve active mode infrastructure along and across the A38 route, improving the attractiveness and perceived safety of active modes and thereby facilitating increased trips.
DfT Operational Sustainability Strategy (2021-2025)	The DfT is required to continue to deliver their departmental duties but in a more efficient and sustainable way. This includes reducing gas emissions, waste and water use produced as part of DfT operations. In addition to procuring more sustainable and efficient products and services, DfT also aims to support nature recovery and adapt to climate change as part of its operations.	The scheme will be constructed in a way to minimise the whole life carbon footprint and to use principles of sustainable procurement when procuring services and products.
Local Transport Note 1/20 (July 2020)	Sets out the standards that DfT now require all local authorities to adhere to in delivering high quality cycle infrastructure. It emphasises that "On busy and faster roads which are usually the most direct route between places, it will be necessary to provide dedicated space for cycling" and recognises that "A cycle route network will include busier major	The scheme includes cycling infrastructure as an integral part of the overall package, recognising that these enhancements are crucial alongside the wider BREP interventions.

Policy/strategy	Relevance/key ambitions	Contribution of A38 BREP Phase 3 scheme (compared to a future no intervention scenario)
	roads as these are usually the most direct routes between major attractors". Therefore, the new guidance emphasises that on corridors such as the A38 cycling provision must be made.	
DfT Decarbonising Transport: Setting the Challenge (March 2020)	DfT set out its aim to develop an innovative and challenging plan that will accelerate the decarbonisation of transport. The Transport Decarbonisation Plan aims to encourage car users to shift to more sustainable mode choices such as public transport, walking and cycling with an ultimate goal of mitigating greenhouse gas emissions. This plan is intending to improve health and make daily life more efficient through delivering policies that will enable shifting from a car dependent transport model to public transport and active travel.	The inclusion of walking and cycling schemes within Phase 3 will help to encourage sustainable travel choices in the longer term. Building on the success of BoD and aiming to contribute to the success of the wider DRT that has been launched by WCC recently, RTI screens powered by a wind turbines/solar panels will be used, and a new DRT point will be introduced near the train station.
Defra's 25 Year Environmental Plan (2018)	People who live near busy roads are most likely to be exposed to dangerous levels of air pollution, and long-term exposure of this kind reduces life expectancy.	The A38 has known air quality issues, so the schemes will be developed in this context and in consultation with Worcestershire Regulatory Services and WCC Development Management.

3.2.2 Greater Birmingham and Midlands Policy Context

Table 3.7 highlights the Greater Birmingham and Midlands level strategic policy context and highlights the key importance within the region on promoting growth and overcoming barriers to growth. Hence, whilst the A38 BREP Phase 3 scheme falls within Worcestershire it is clear that the scheme has a regional significance.

Table 3.7 – Greater Birmingham/Midlands policy context

Policy/strategy	Relevance/key ambitions	Contribution of A38 BREP Phase 3 scheme (compared to a future no intervention scenario)
Midlands Connect Strategy – Powering the Midlands Engine (March 2017)	The vision is for a stronger economy and a Midlands Engine which powers the UK. It focusses on investment that overcomes barriers to growth.	The scheme will help to support growth by improving a key route through the Midlands and supporting access to the SRN and international gateways, including Birmingham Airport.
Midlands Connect Transport Strategy (2022)	Midlands Connect has published a new transport strategy. The strategy aims to help the region level up, decarbonise transport and build a resilient economy.	The scheme will help to support growth by improving a key route through the Midlands and supporting access to the SRN and international gateways, including Birmingham Airport. This will assist in levelling up the region and providing a resilient economy through improved connectivity.
Midlands Connect Our Routes to Growth (July 2018)	Highlights the importance of securing investment in the MRN and an overall ambition for faster, more reliable, higher capacity roads.	Same as above
Midlands Connect, regional evidence base (July 2019)	Highlights that the Midlands economy is not reaching its full potential and the need for roads investment to better support the economy. Outlines the core importance of the MRN to industry in the Midlands. Identifies the A38 BREP as a regional priority for MRN investment and a key part of the MRN network.	This FBC takes forward the MRN scheme backed by Midlands Connect and aims to enhance the A38 corridor so that it can better support the development of the local Bromsgrove economy.
GBSLEP Strategic Economic Plan 2016 – 2030 (2017)	Sets out the importance of providing appropriate infrastructure improvements to support proposed development. Notes the importance of the A38 in terms of “Optimising economic growth through development at motorway junctions and at other well-connected sites…"	Improvements to the A38 corridor will make journeys onto the SRN, and into Birmingham, more reliable and help to support the economic growth of the region.
MHCLG West Midlands Local Industrial Strategy (2019)	Recognises that infrastructure is one of the five foundations of productivity and also outlines the following ambition: “setting out plans to develop inclusive growth corridors. This will ensure infrastructure is integrated with other programmes locally to maximise impact on employment and skills, high quality housing and development viability and improved public green space and air quality”.	The scheme will help to connect employment and skills and support the wider industrial strategy for the region.

3.2.3 Worcestershire Policy Context

Table 3.8 summarises the key policy drivers across Worcestershire County Council's ambition and strategy. This shows that improvements to the A38 are a clear priority for Worcestershire and that the Phase 3 scheme is closely aligned with the overall business strategy of both the LEP and WCC.

Table 3.8 – Worcestershire policy context

Policy/strategy	Relevance/key ambitions	Contribution of A38 BREP Phase 3 scheme (compared to a future no intervention scenario)
WLEP Strategic Economic Plan 2014 (and 2017 review)	Additional investment in Worcestershire's transport infrastructure and services is essential to provide businesses with improved access to markets and employees and to encourage economic growth. The SEP recognises that congestion is particularly acute in Bromsgrove and identifies the need for improvements to the A38 corridor as part of its City and Town Centre Investment Programme.	By enhancing the A38 corridor, the scheme will help to support the wider development aspirations of WLEP and the local Councils.
WLEP Plan for Growth 2020-2040	The capacity of existing motorway junctions and strategic corridors such as the A38 particularly at Bromsgrove is not sufficient partially due to higher than national average of people who commute by private vehicles. There is a need to improve movement of people and freight along key road corridors to ease congestion and improve productivity.	Improvements to the A38 Bromsgrove corridor as a key physical infrastructure project will unlock land for additional homes and new office and warehouse space in an area where the Green Belt is a significant constraint on development.
WCC Corporate Plan 2022 - 2027	'Open for business' is one of the key priorities of the Plan. Continued investment in transport infrastructure is considered important in achieving this aim - as the Plan states that 'having good transport and digital infrastructure is a pre-requisite to attract and retain high-tech and knowledge intensive businesses and building a resilient and dynamic economy for the future'. Another key priority is the environment. The Plan commits to 'improving all modes of transport, striving for national top-quartile performance in the condition of our roads and pavements'.	The Plan notes that reducing congestion has been identified by residents as a top priority, therefore WCC is investing in major projects such as improving the A38 in Bromsgrove. The A38 BREP scheme will contribute directly to this and to the other key priorities of 'open for business' by reducing congestion and improving journey times.
WCC Economic Strategy, 2010 - 2020	Sets out the importance of 'Supporting the sustainable development of the county through infrastructure development, especially transport'.	Improvements to the A38 will improve journey time reliability and reduce congestion, supporting journeys to work. By enhancing a key transport

Policy/strategy	Relevance/key ambitions	Contribution of A38 BREP Phase 3 scheme (compared to a future no intervention scenario)
		link, this scheme will assist in supporting the economic strategy.
WCC LTP4 (2017)	Identifies key issues in north Worcestershire and the Bromsgrove area in relation to congestion and the need to ensure infrastructure can support development. Identifies the A38 as a key corridor requiring improvements. Includes Strategic Active Travel Corridor Schemes, including 8 improvement schemes in Bromsgrove and several on the A38 itself. The upcoming LTP5 is expected to reflect a continuation in approach and vision.	This scheme will address the priorities of the adopted LTP. The refined scheme for the A38 corridor includes targeted improvements for pedestrians and cyclists and supports the development of Active Travel Corridors on and adjacent to the A38. This scheme, as part of a wider package of measures, is consistent with WCC policy on walking and cycling.
WCC Network Management Plan (2017)	The Network Management Plan identifies a key need to fund and deliver capacity enhancements at pinch points to support development growth, address air quality issues and tackle congestion.	The A38 BREP scheme will tackle key pinch points, in line with the approach set out in the Network Management Plan.
WCC Transport Policies (2017)	Policy WC1 commits to embedding safe walking and cycling infrastructure provision within the delivery of all other transport schemes. Various policies provide guidance on the type of pedestrian facilities. The policies also set a framework for the consideration of transport and air quality.	The A38 BREP scheme, includes walking and cycling improvements as a core part of the overall package. These interventions have been designed in line with the criteria and principles set out in the Transport Policies document.
Worcestershire Regulatory Services Air Quality Action Plan (AQAP)	The AQAP sets out actions that will be implemented to improve air quality and work towards meeting objectives	The scheme will be developed in this context and in consultation with Worcestershire Regulatory Services.
Worcestershire Energy Strategy	This includes a priority theme to promote low carbon transport and active travel and is particularly focussed on promoting active travel corridors which improve facilities for walking and cycling.	The active mode elements of the scheme align with this important priority.
Other transport policy	NPIF - WCC was successful in securing NPIF funding to investigate and identify improvements to nine cycle routes in Bromsgrove. Three of these cross the A38. Following this success WCC has been actively identifying further opportunities	Removing the barrier/segregation caused by the A38 would increase the attractiveness of Bromsgrove Rail Station and using more sustainable modes to travel around the town. Improved connectivity to and from the Rail Station, combined with improved

Policy/strategy	Relevance/key ambitions	Contribution of A38 BREP Phase 3 scheme (compared to a future no intervention scenario)
	for enhancements to walking and cycling infrastructure including adjacent to and across the A38.	services, will support access to the planned HS2 stations in Birmingham.

3.2.4 Local Policy Context

Table 3.9 summarises the local level District Council policy context.

Table 3.9 – Worcestershire policy context

Policy/strategy	Relevance/key ambitions	Contribution of A38 BREP Phase 3 scheme (compared to a future no intervention scenario)
Adopted Bromsgrove District Plan (2017)	The Bromsgrove District Plan includes major residential development sites around the edge of Bromsgrove, with Perryfields Road and Whitford Road being particularly relevant to the A38. Smaller residential allocations are also found in surrounding areas. In total the Local Plan identifies a need for 7,000 dwellings and 28 Hectares of employment land in the period 2011-2030. However, the adopted local plan only allocated land for 4,700 dwellings to 2023, noting that allocating land for the remaining 2,300 homes would be subject to a Green Belt review as part of a Local Plan Review. Subject to the ongoing Local Plan review, the scheme may further support delivery of additional homes and employment land. The Local Plan supports sustainable transport infrastructure improvements to provide a better walking and cycling experience in and around Bromsgrove's urban area.	This scheme will deliver the improvements required to support the development envisaged across Bromsgrove District and will also support the important cross- border sites.
Bromsgrove District Plan review (ongoing)	The Local Plan review will also identify development allocations for growth beyond 2030 and in its Issues and Options consultation put forward various scenarios. The consultation documents published in September 2019 proposed that the new Plan will have a likely start date of 2023 and an end date of 2040. Over this period the Plan will be required to provide for	In WCC's response to the ongoing Bromsgrove Local Plan Review Issues and Options consultation, they noted that whatever timescale or housing number is, the ability of the road network in Bromsgrove to accommodate further growth is severely constrained.

Policy/strategy	Relevance/key ambitions	Contribution of A38 BREP Phase 3 scheme (compared to a future no intervention scenario)
	at least 6,443 dwellings and up to 90 Hectares of employment land.	
Adopted Redditch Local Plan (2017)	Within close proximity of the A38 corridor area there are significant cross-boundary allocations within the adopted Local Plan for Redditch. This includes an additional 3,400 dwellings (and 5.5 hectares of employment land) on the border with Redditch but located within Bromsgrove District, to meet Redditch's housing need, as identified in their own Local Plan. The allocation at Foxlydiate is particularly relevant to the A38. In addition, there are further allocations within the Redditch Local Plan (and sited within Redditch itself). Around 3,000 dwellings and 27.5 hectares of employment land are to be accommodated within Redditch Borough.	Improvements to the A38 corridor will support the housing growth, particularly where this is close to the A448 corridor, which in turn connects to the A38 at Bromsgrove and provides for southbound access to the M5 corridor in addition to the M42 junction.
Infrastructure Delivery Plans (2014)	The Infrastructure Delivery Plans (IDP) for both Bromsgrove District and Redditch Borough recognise that junction improvements are required along the length of the A38 corridor in order to help support the development outlined in the adopted Local Plans.	This scheme provides the junction schemes noted as required in the IDP.

3.2.5 Levelling Up Priorities

3.2.5.1 Government Levelling up Agenda

As outlined in the Levelling Up White Paper, the government is committed to spreading opportunity and prosperity to all parts of the UK. The Department for Levelling Up, Housing and Communities (DLUHC) has an ambitious agenda of Levelling Up regions of the UK that have, both historically and contemporaneously, suffered from a disproportionately low quantity of, and poor quality of, economic opportunities. Through this, the UK has the potential to benefit from significantly augmented economic growth, reduced unemployment and greater wellbeing in areas where these are desperately required, such as the Midlands and the North.

Bromsgrove itself has been identified as Category 2 by DLUHC, reflecting its status as a priority region for Levelling Up interventions relating to employment, productivity and wellbeing. These priorities are stated as follows:

- Boosting productivity, pay, jobs and living standards by growing the private sector.
- Spreading opportunities and improving public services.
- Restoring a sense of community, local pride and belonging.
- Empowering local leaders and communities.

3.2.5.2 Transport As an Enabler for Levelling Up

DfT aims to deliver on the Levelling Up agenda by improving connectivity across the UK and growing the economy by enhancing the transport network on time and on budget. DfT also recognises that a conscious shift in focus for transport investments is required to better link towns, cities and left behind places outside of London and the South East region. As such, the Department is committed to delivering on priority outcomes from the Levelling Up agenda. Further, DfT's Outcome Delivery Plan outlines the aims to raise productivity and empower places so that everyone across the country can benefit from a transport perspective.

Within this context, DfT's Levelling Up Toolkit states that transport is a vital enabler for a productive and well-connected economy, allowing the movement of people and goods in towns and cities across the UK. Investment in the transport network can create larger and more unified labour markets, improve access to local services, enhance business connectivity, and expand access to new and existing markets, including international gateways. These impacts are pivotal in ensuring inequality is tackled on a national scale, especially as underfunded regions recover from the COVID-19 pandemic.

In addition, the MRN programme places further strategic emphasis on the middle tier of the country's busiest and economically significant 'A' roads. The government has committed to a multi-billion MRN funding between 2020 – 2025 to deliver a series of objectives. As with DfT's priorities, these MRN funding objectives also align with the Levelling Up priorities.

Specific to the A38 BREP Phase 3 proposals, the proposed package of interventions will alleviate congestion, support economic growth, rebalancing through enabling freer movement of goods, services and labour in the region and support housing delivery.

3.2.5.3 Levelling Up in Worcestershire

WCC's corporate strategy is presented in 'Shaping Worcestershire's Future'. The document outlines the council's plan for the region as well as its priorities over 2022 – 2027. These priorities relate to businesses, children and families, the environment and health and wellbeing. The successful championing of these priorities will lead to levelling up of the region and reducing disparity in a national context, as well as against the individual local areas inside of its constituency.

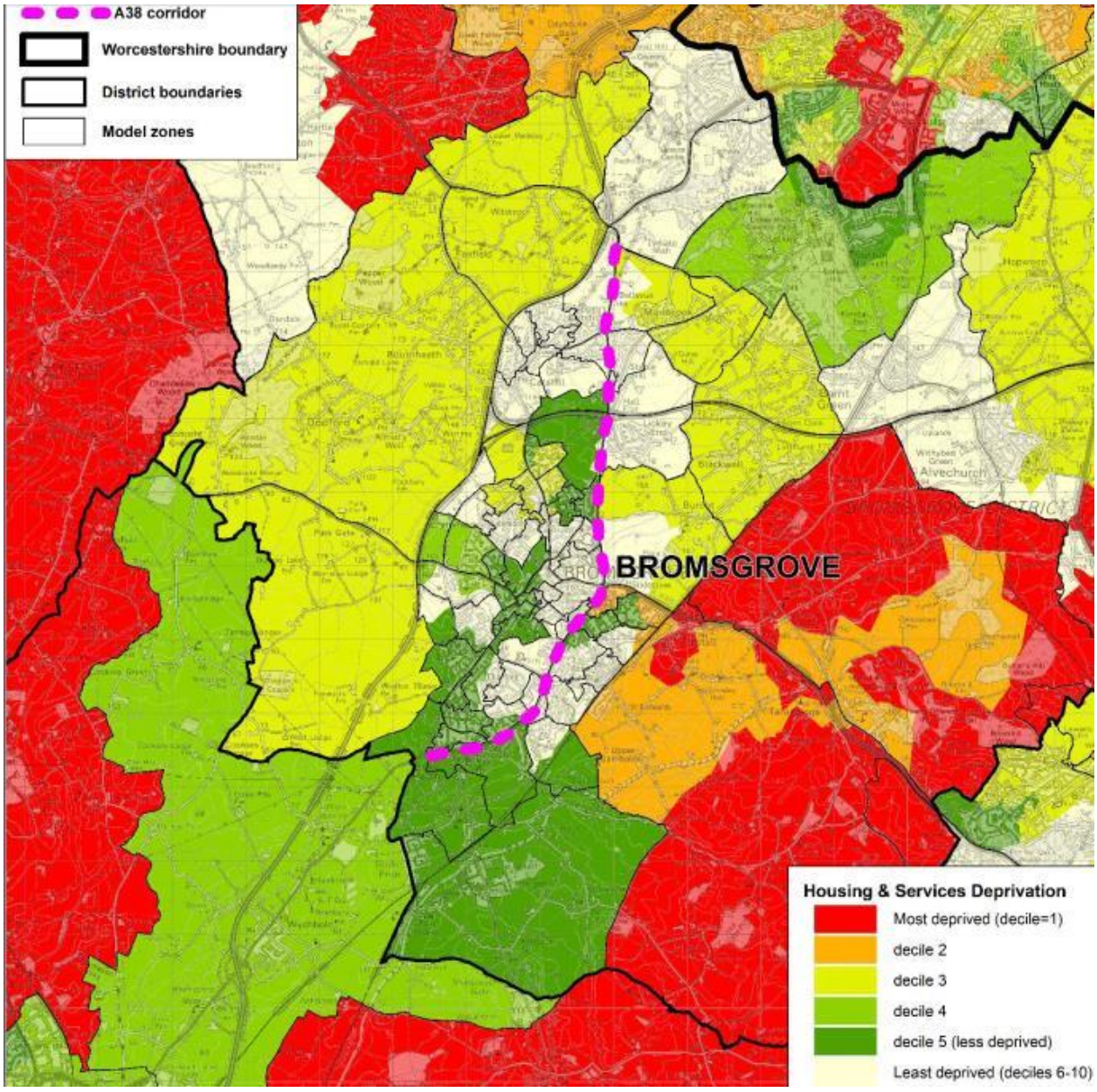
Transport is a key pre-requisite for these areas of focus in Shaping Worcestershire's Future. Within this context, A38 BREP Phase 3 schemes are envisaged to support Levelling Up and growth drivers presented in WCC's corporate strategy by providing better transport infrastructure and improving connectivity on key MRN corridors in Worcestershire.

As identified earlier in this section, Bromsgrove has been identified as a Category 2 region by DLUHC. As such, there is clear requirement for interventions that unlock economic opportunities and wellbeing within the region. Investment in the A38 corridor plays a vital role in this effort through alleviating issues of congestion and reliability, reducing severance between local business and communities. This would enhance productivity, enable economic growth and facilitate an increase in living standards. Through this, a greater sense of civic and community pride could be enabled in the region, empowering local communities. The A38 BREP provides clear benefits to help achieve National, Regional and Local Levelling Up objectives.

Additionally, the Levelling Up need around the A38 corridor is further highlighted by Index of Multiple Deprivation (IMD) 2019 and its domain data. IMD data provides aggregate view of deprivation of an area. The Barriers to Housing and Services Domain measures the physical and financial accessibility of housing and local services. The indicators fall into two sub-domains: 'geographical barriers', which relate to the physical proximity of local services, and 'wider barriers' which includes issues relating to access to housing such as affordability and homelessness.

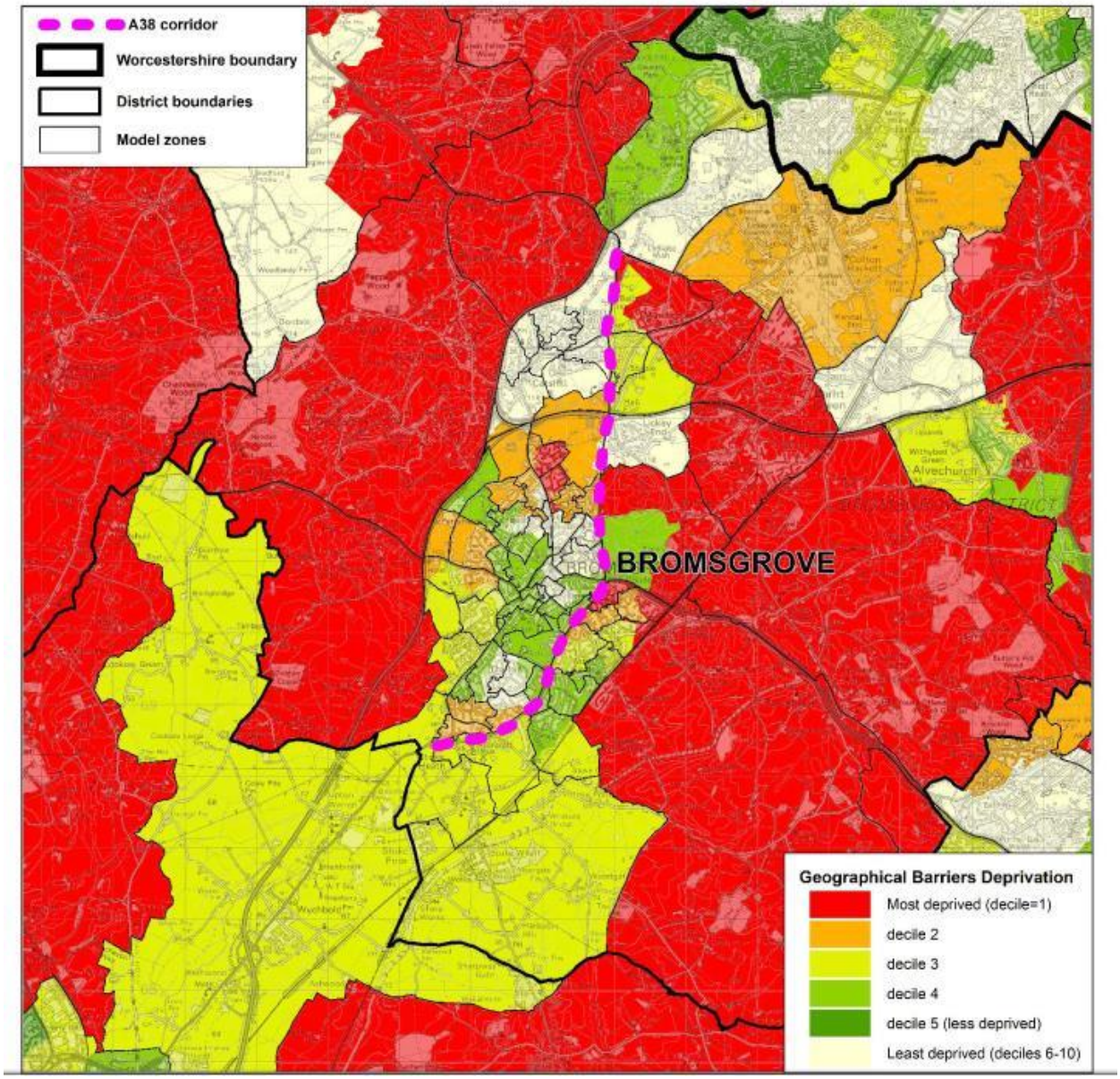
Figure 3.1 below demonstrates the extent of deprivation in terms of Housing and Services in Worcestershire around the A38 corridor. In particular, the corridor is in close proximity to some of the most deprived areas in the county in terms of physical and financial accessibility of housing and local services.

Figure 3.8 - Housing and services deprivation



Furthermore, Figure 3.9 below highlights the extent of deprivation particularly in terms of physical access to services around the A38 corridor. A large proportion of the immediate context area of A38 BREP Phase 3 suffers from high levels of deprivation in terms of access to services.

Figure 3.9 - Geographical barrier deprivation



Bromsgrove town received £14.5m funding in 2021 from Levelling Up Fund. Redditch also received £15.6m from Towns Fund, the scheme improvements support links to Redditch via A38/A448, and south of A448 to M5 J5. The A38 BREP Phase 3 will help to unlock growth, rebalance the housing market and make it more affordable and accessible for local communities. Equally, the interventions will bring about the step change in local accessibility. Such improvements to area's physical and socio-economic fabric will make significant contributions to Levelling Up the local communities. The DfT Levelling Up toolkit is included in Appendix S.8.

3.2.6 Overarching Approach for Bromsgrove and the A38 Corridor

The overarching approach currently being taken to transport in Bromsgrove by WCC, developed in response to current and predicted challenges and reflected in local level planning and transport policies and strategies, is to enhance the A38 corridor as a key priority. Policy recognises the critical importance of improving the A38 and this is reflected in the LTP, which prioritises a scheme that will improve junctions, increase capacity and reduce queues and delays and considerably enhance conditions for cyclist and pedestrians along and across the A38 and in the wider area.

However, WCCs wider approach to transport in Bromsgrove also recognises the importance of other improvements to the town's provision and network. The vision for enhancement of the A38 is supported in the ambitions set out in policy and the actions currently being taken by WCC, by a desire to improve:

- Public transport connectivity – To further promote the use and the reliability of public transport access to Bromsgrove Rail Station and rail services through the upgrade of bus shelters, the use of smart technology and Real Time Information (RTI) in order to build on the success of BoD (which was a pilot DRT project) and to contribute to the wider DRT that has been launched by WCC recently, and to improve wayfinding signage in order to achieve enhanced awareness and confidence in accessing the station, combined with an ambition to improve walking and cycle routes to Bromsgrove Rail Station.
- Cycle and walking infrastructure – It is recognised that the A38 acts as a barrier/causes severance for walking and cycling movements within Bromsgrove and the volume of traffic in conjunction with a lack of infrastructure makes walking and cycling unattractive. WCC is continuing to build on walking and cycling improvements started through NPIF, developing a targeted list of schemes and promoting active travel campaigns as identified in the LTP4. Improved routes along, across and adjacent to the A38 are an important part of this wider ambition.
- Local Road Network (LRN) – Improvements to the LRN are required to accommodate planned housing and employment growth in Bromsgrove. These works will be delivered by developers. However, it is recognised that the LRN will only operate efficiently if the delays on the A38 are resolved.

3.3 The Case for Change

The A38 BREP Phase 3 MRN scheme aims to address both existing and future problems. The identification of problems has been based on those identified in existing and evolving policy, as well as modelling and other data sources.

The WCC Local Transport Plan 4 (LTP4) identified that the main challenges for North East Worcestershire, including the Bromsgrove area, are:

- To relieve congestion.
- To enhance transport network reliability and resilience.
- To enable and promote economic growth.
- To tackle air quality issues.
- To improve all aspects of road safety.

In addition, the policy and vision of WCC for Bromsgrove recognises additional challenges in terms of addressing barriers to walking and cycling and improving public transport.

The following sections consider the challenges affecting the A38 corridor at Bromsgrove in the context of the above. It identifies specific problems that require attention in respect of congestion, reliability, enabling growth and catering for pedestrians and cyclists. Issues around air quality, noise, public transport and safety are noted as further important considerations.

The following data sources have been used in these sections. In addition, the traffic modelling has used additional data, and this is set out in the Traffic Data Collection Report (Appendix TM.2) in more detail.

- Traffic Surveys undertaken as part of the 2017 Traffic Model surveys, including:
    - Manual Classified Counts.

  - Automatic Traffic Counts.
  - Queue Surveys.
  - Roadside Interview Surveys.
- 2015 - 2020 Five Year collision data (Pre COVID-19).
- 2020 Pedestrian and Cycle surveys (Pre COVID-19).

Additionally, consideration has been given to the following:

- 2011 Census.
- Information provided by NH on diversion interventions from the M5 and M42 onto the A38.
- Environment baseline information.

More details on each of the problems and considerations are contained in the OAR (Appendix S.1) and in the following paragraphs that describe existing and future situations.

No material changes are observed in the case for change section (existing and future situations) in comparison with the OBC submission.

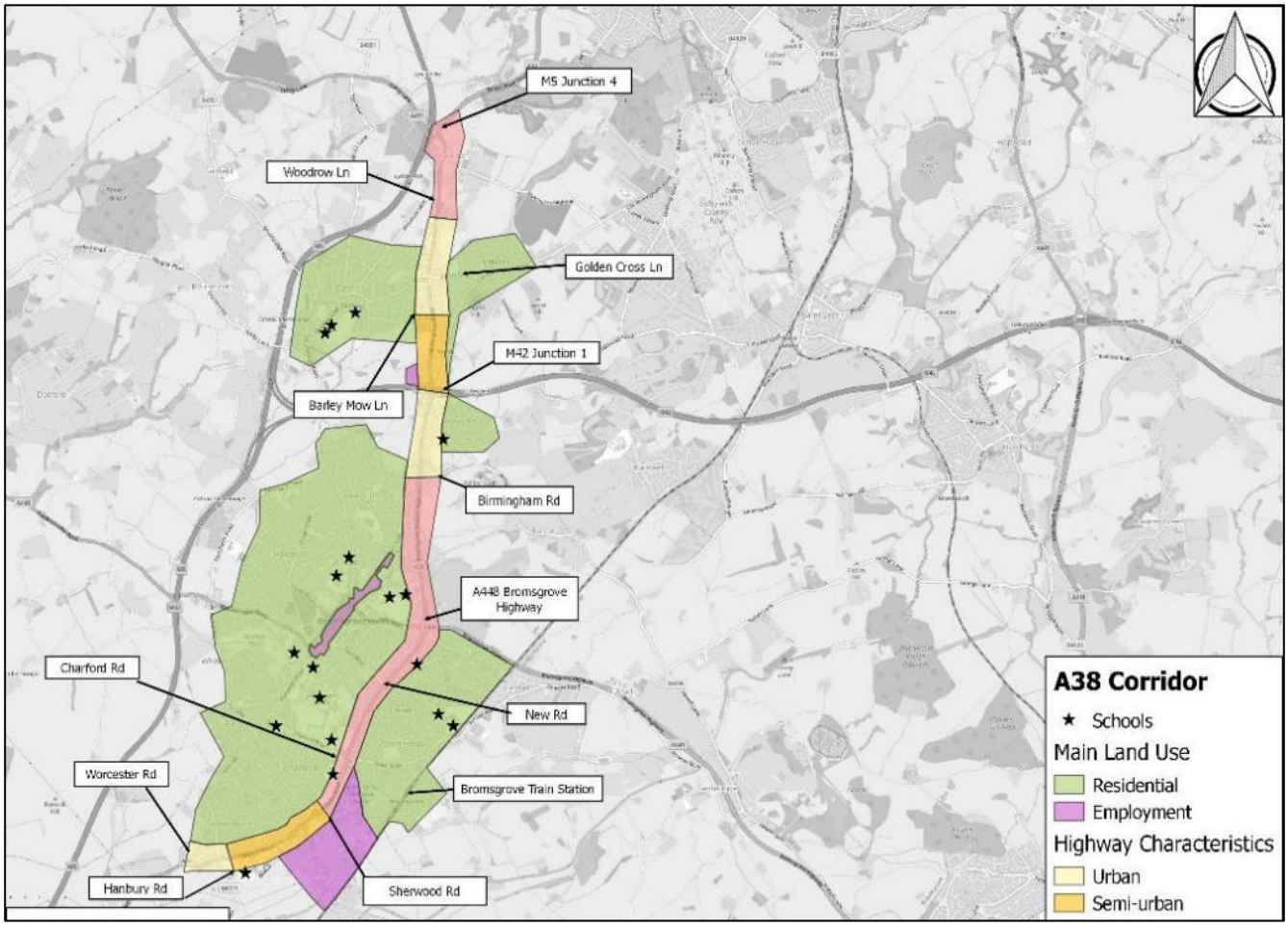
3.3.1 Existing Arrangements

There is no material change in this section when compared to the OBC submission. The following paragraphs document the evidence in relation to the existing situation.

3.3.1.1 Route Character and Function

The A38 corridor has a number of differing characteristics, dependent on the section of route being considered. The key elements which influence the character of the route are the design standard, and geometric layout and the neighbouring land uses. Figure 3.10 below shows a summary of the A38 corridor in the study area, and it's differing character and adjacent land use.

Figure 3.10 – Character areas, reflecting highway design standard and adjoining uses



3.3.1.1.1 Urban Route Function

Within the A38 corridor an urban character is present at three locations, these are characterised by a 30 or 40mph speed limit, with footways present on one or both sides of the carriageway, pedestrian crossing facilities, and direct access to dwellings and local services. The sections that are urban are located at:

- Worcester Road/B4094 Roundabout to Hanbury Road (Stoke Heath).
- Birmingham Road to M42 Junction 1 (Lickey End).
- Barley Mow Lane to Birmingham Road (Catshill).

At these locations the A38 has a role to facilitate and maintain pedestrian and cycle movements, in addition to the A38 strategic role at junctions, to meet the local and strategic needs of the areas.

3.3.1.1.2 Strategic Route Function

There are sections of the A38 that have national speed limits, to cater for a high movement functionality. Along these sections there are no or poor-quality pedestrian or cyclist infrastructure, leading to gaps in the active mode travel network. The sections defined as strategic are:

- Austin Road to Birmingham Road junction.
- M5 Junction 4 to Old Birmingham Road.

The section between Austin Road and Birmingham Road, passes by, although with no direct access to schools, retail stores and residential areas. The speed limit on this section varies between 40mph and the national speed limit. The design of the road impacts the ability for active modes to cross between the various land uses and Bromsgrove Rail Station to the east of the A38, leading to a degree of severance.

3.3.1.1.3 Semi-Urban Route Function

Other sections of the route are defined as Semi-Urban; these are areas that are subject to a lower 30 or 40mph speed limit, with pedestrian facilities of varying quality. Within these areas are a degree of sporadic frontage activity on both sides of the A38 in accessing both residential and employment land.

- Hanbury Road to Austin Road junction.
- M42 Junction 1 to Barley Mow Lane.

In summary, the route has a varied character, serving a number of different land uses, with varying degrees of design standards for all modes of transport.

3.3.1.2 Movement Patterns

Assessment of the 2017 Roadside Interview Survey (RSI) was undertaken to understand trip origin and destination pairings.

The analysis presented at this location, considers the three RSI sites that were located directly on the A38 corridor. All sites recorded trips inbound to the Bromsgrove Town Centre direction of travel. These sites are referred to as:

- Site A – South of M5 Junction 4 (RSI Site 7).
- Site B – North of A38 Birmingham Road junction (RSI Site 9).
- Site C – South of the A38 / Worcester Road roundabout (RSI Site 3).

Figure 3.11 shows the location of the three RSI sites in relation to the A38 corridor. Figure 3.12 to Figure 3.14 show the origins-destinations based on the data collected for each site, while Figure 3.15 combines the same data for the three sites.

Figure 3.11 – RSI site locations (2017 Survey)

Figure 3.12 – Combined site A (RSI site 7) - Origin destinations

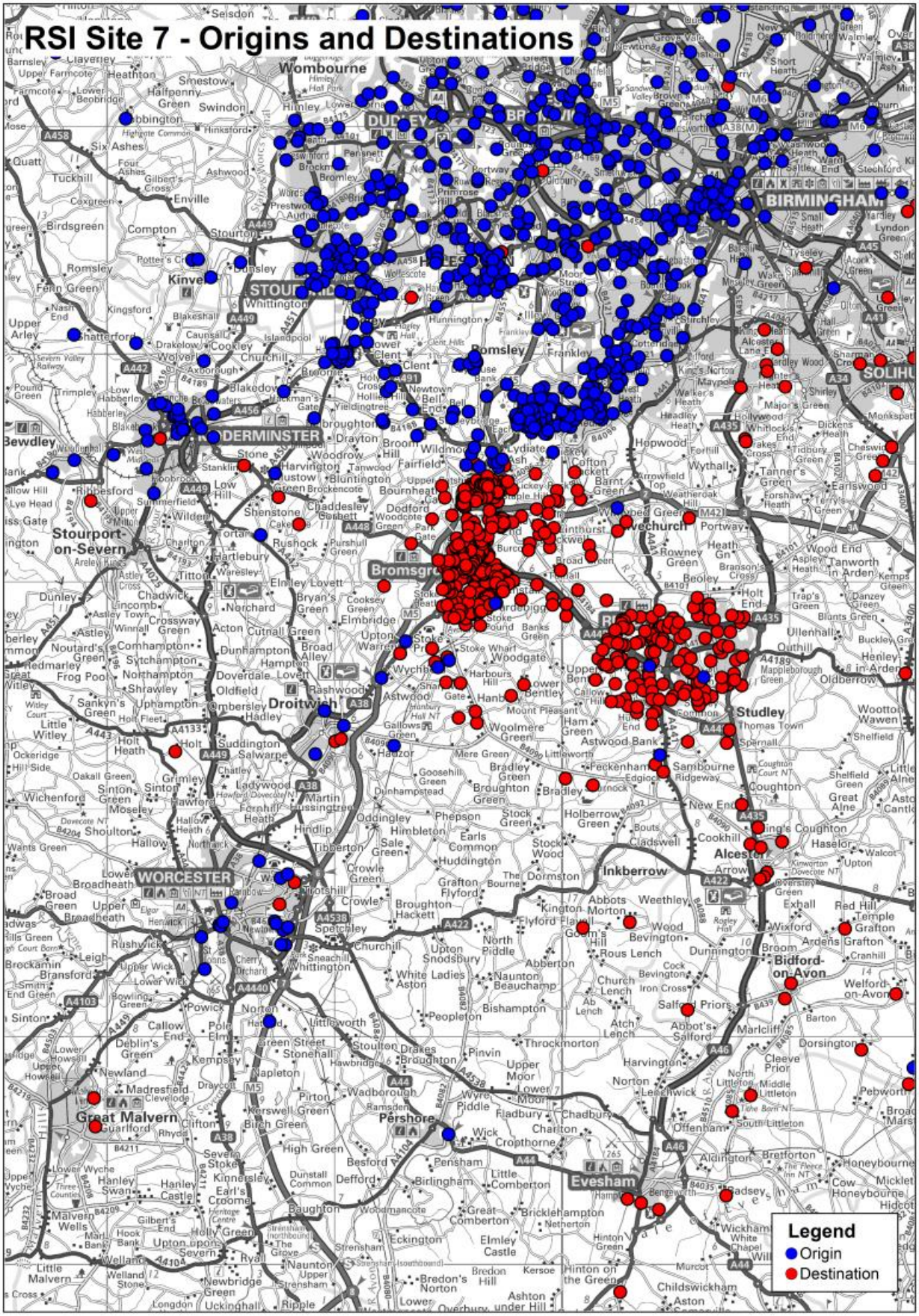


Figure 3.13 – Combined site B (RSI site 9) - Origin destinations

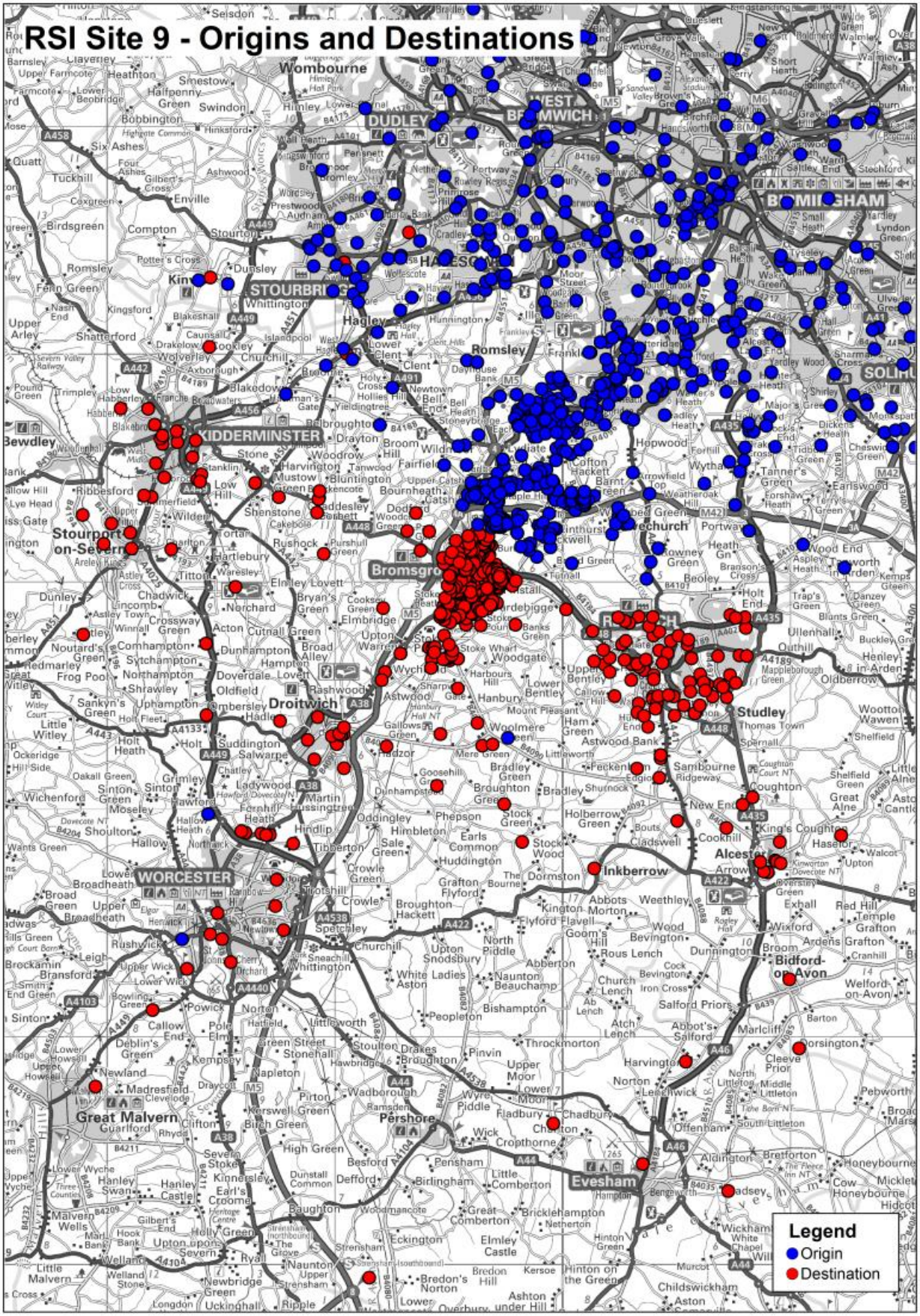


Figure 3.14 – Combined RSI site C (RSI site 3) - Origin destinations

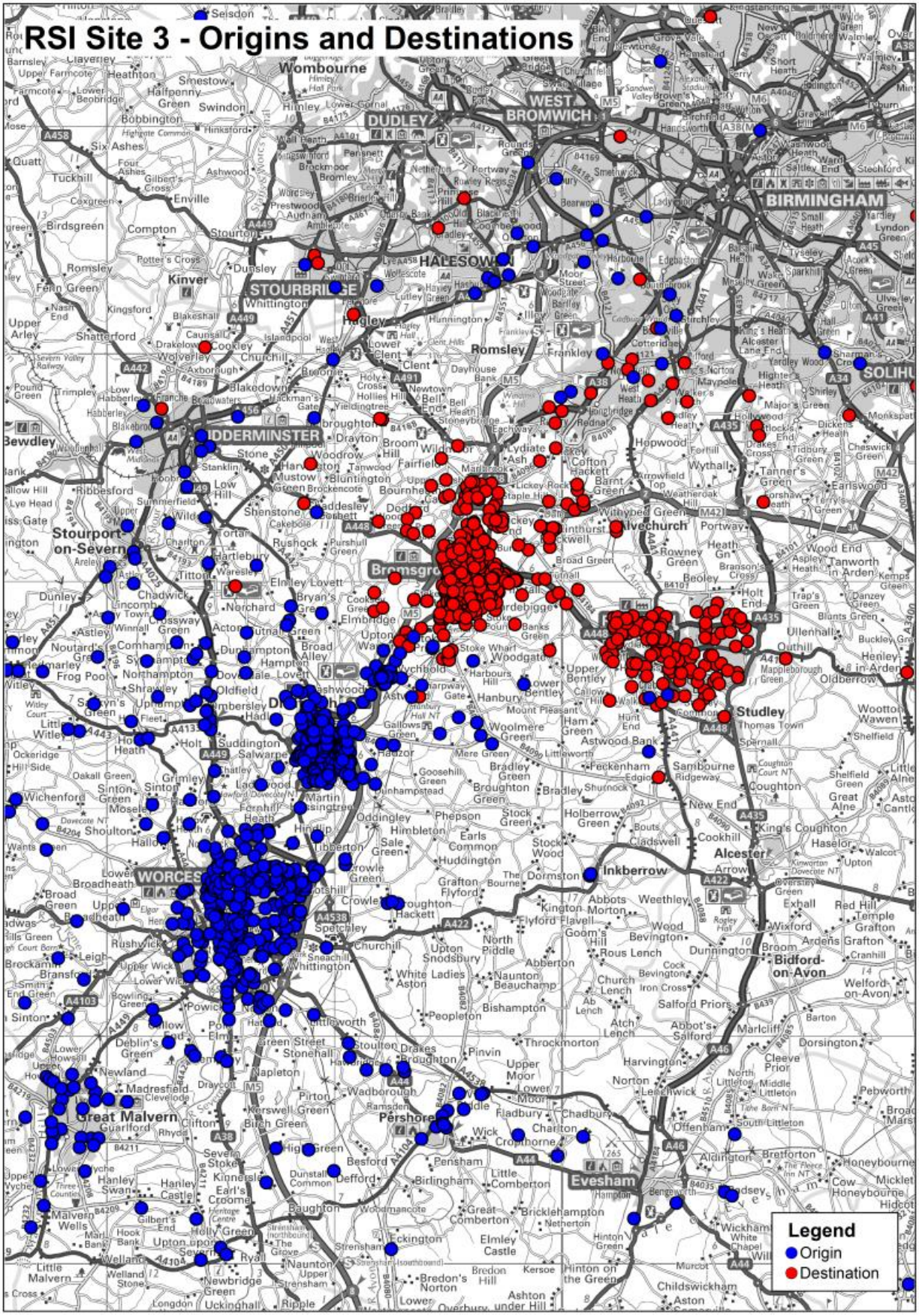
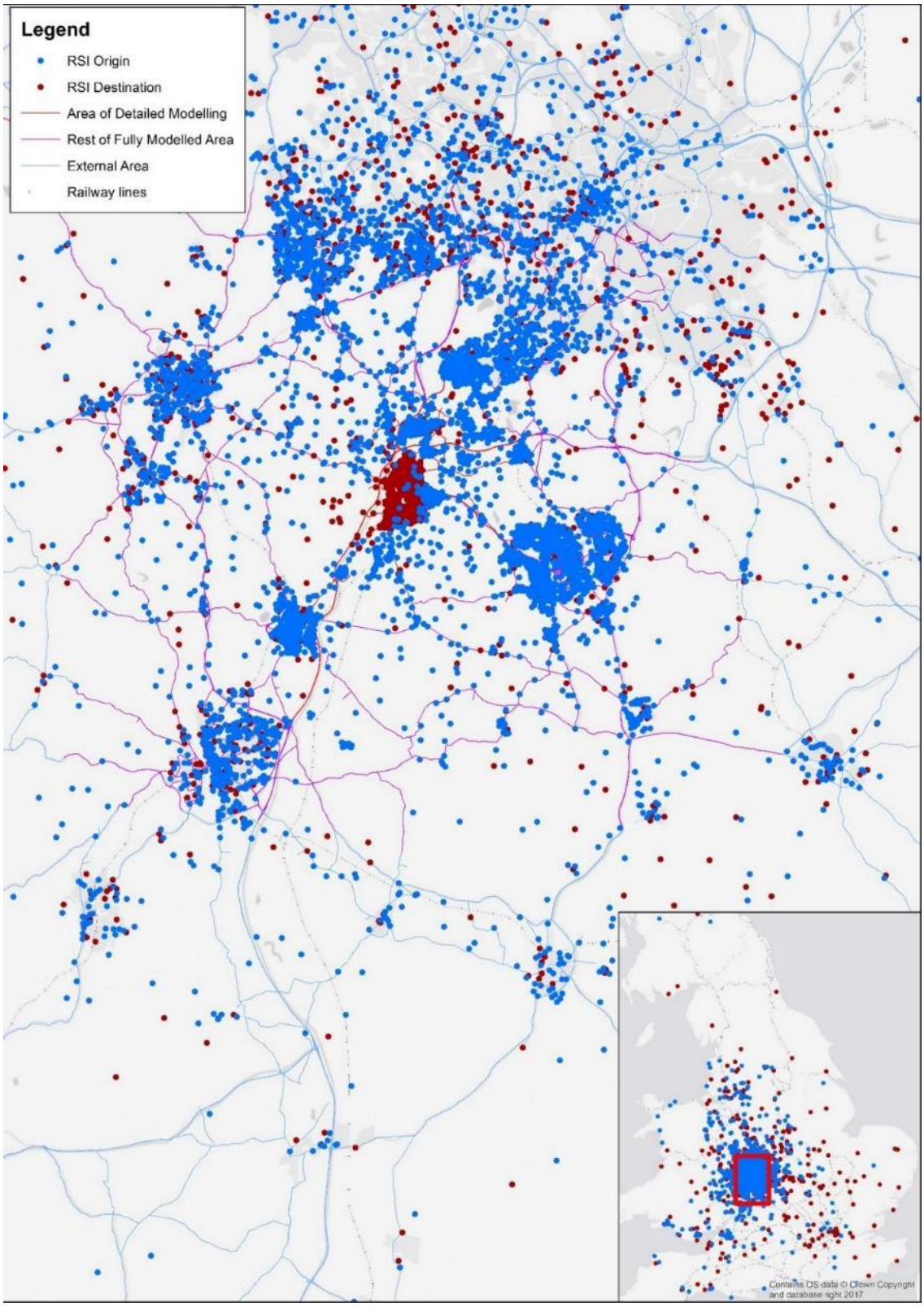


Figure 3.15 – Combined RSI sites (A/B/C) - Origin destinations



3.3.1.2.1 OD Data Evaluation by Site – Site Ref A (South of M5 Junction 4)

The inbound to Bromsgrove site shows that there are both destination in Bromsgrove, but also in the Redditch area. The majority of people travelling in this direction is from south Birmingham, and the Black Country areas.

3.3.1.2.2 OD Data Evaluation by Site – Site Ref B (North of A38 Birmingham Road)

The majority of trips originate from the South Birmingham area clustered around the A38 corridor, in addition to a cluster around Catsthill. In terms of destinations the majority of trips are either Bromsgrove or Redditch focussed, indicating the importance of the A38/A448 connections.

3.3.1.2.3 OD Data Evaluation by Site – Site Ref C (South of A38 / Worcester Road Roundabout)

The majority of trips at this location are from Droitwich Spa and Worcester, with Bromsgrove and Redditch being the key destinations, trips north of the Bromsgrove conurbation to Birmingham, are minimal, indicating that through trips are more likely to be utilising the M5 corridor.

3.3.1.2.4 OD Data Evaluation Tables

The RSI data at the three locations have demonstrated that there are trips that have the following travel patterns (Figure 3.13), which are defined as being either local trips (shorter distance), and strategic trips (longer distance or passing over or along the A38 corridor):

- Origin and Destination within Bromsgrove (Local Trips) – Assumed as within 5km of Bromsgrove centre.
- Origin or Destination within Bromsgrove (Strategic Trips).
- Origin and Destination outside of Bromsgrove, but travelling along A38 corridor in part, or its entirety (Strategic Trips).

Table 3.10 – OD Data evaluation

Trip Type	Absolute Value	Percentage
Origin and Destination within Bromsgrove (Local Trips)	2,201	17.95%
Origin or Destination within Bromsgrove (Strategic Trips)	7,304	59.55%
Origin and Destination outside of Bromsgrove, but travelling along A38 corridor in part, or its entirety. (Strategic Trips)	2,760	22.50%
Total	12,265	100.0%

The data shows that trips with an origin or destination within Bromsgrove accounts for 77.5% of trips on the A38 corridor based upon the RSI data at three key strategic points on the A38, meaning that there is about 22.5% of trips that are travelling along the A38 that start and end outside Bromsgrove. Of these trips a small proportion appear to be travelling the full length of the A38, with a significant number joining at the A448 junction half-way along the link.

3.3.1.3 Census Data and Socio-Economic Context

The 2011 census data indicates that Bromsgrove has a high level of car dependency (Table 3.11), with sustainable modes representing a small proportion of overall trips when compared with the West Midlands and England figures. Further, Bromsgrove households have a higher level of car ownership (Table 3.12) than the corresponding West Midlands and England figures.

The travel pattern data (Table 3.13, Table 3.14 and Table 3.15) indicates a strong linkage between Bromsgrove residents with employment opportunities outside of the Bromsgrove Local Authority area and connections to Birmingham, Redditch, Dudley and Solihull. Furthermore, Bromsgrove attracts a proportion of trips from Birmingham, Redditch, Dudley and Wychavon areas.

Table 3.11 – Journey to work data (2011 Census – Table CT1108)

Mode	Bromsgrove	West Midlands	England & Wales
Work at Home	14.97%	9.98%	10.46%
Train, Underground, Metro, Light Rail, Tram	1.11%	2.56%	8.70%
Bus; minibus or coach	3.40%	7.45%	7.19%
Car Driver	64.41%	61.65%	54.45%
Car Passenger	5.98%	5.92%	4.99%
Bicycle	1.13%	1.96%	2.79%
On foot	7.72%	9.03%	9.77%
Other	1.26%	1.46%	1.66%

Table 3.12 shows that Bromsgrove has a much higher proportion of home workers than the West Midlands region, but of those that do travel, a higher proportion chose the car over sustainable travel modes, when compared to the national and regional patterns.

Table 3.12 – Car ownership (2011 Census – Table CT0202)

Location	No Cars / Vans in household	1 Car / Van in household	2 or more Cars / Vans in household
England and Wales	17.08%	38.72%	44.20%
England	17.18%	38.82%	44.00%
West Midlands	17.55%	37.95%	44.50%
Bromsgrove	5.17%	24.47%	70.36%

The data in Table 3.12 shows that the proportion of multiple cars owning households is significantly higher than the comparative data for England and the West Midlands areas.

Table 3.13 – Distance travelled to work (2011 Census – Table CT1109)

Distance	Bromsgrove	West Midlands	England & Wales
< 2 km	15.13%	16.47%	16.66%
2 – 5 km	15.20%	20.51%	18.34%
5-10 km	17.09%	18.44%	17.36%
10-20 km	17.83%	14.61%	15.36%
20-30 km	6.41%	5.79%	5.78%
30-40 km	1.95%	2.31%	2.57%
40-60km	1.01%	1.82%	2.33%
>60 km	1.91%	2.66%	3.00%
Work mainly at or from home	14.97%	9.98%	10.46%
No fixed place of work	8.50%	7.40%	8.15%

Table 3.13 shows that there are proportionally fewer shorter trips under 5 km than across the West Midlands and the national proportions. There are a greater proportion of trips in the 10-30 km categories which potentially demonstrates Bromsgrove linkages to the wider West Midlands and the areas of Birmingham, Dudley and Solihull areas, compared to the West Midlands as a whole. There is also a lower proportion of commute trips that are over 30km than the national and regional proportions.

Table 3.14 – Commuting destinations from Bromsgrove (>1000 Trips) (Nomis – RF04AEW)

Local Authority Area – Place of Work	Trips	Percentage
Bromsgrove	11275	30.4%
Birmingham	9983	26.9%
Redditch	2904	7.8%
Dudley	1896	5.1%
Solihull	1892	5.1%
Wychavon	1550	4.2%
Sandwell	1325	3.6%
Worcester	1177	3.2%
Other	5131	13.8%
Total	37133	100%

Table 3.15 – Commuting destinations to Bromsgrove (>1000 Trips) (Nomis – RF04AEW)

Local Authority Area – Place of Work	Trips	Percentage
Bromsgrove	11275	37.5%
Birmingham	5071	16.8%
Redditch	3764	12.5%
Dudley	1934	6.4%
Wychavon	1518	5.0%
Wyre Forest	1181	3.9%
Other	5357	17.8%
Total	30100	100%

Table 3.14 and

Table 3.15 show a strong linkage between Bromsgrove and Birmingham and Redditch, with nearly 35% of trips heading out of Bromsgrove, a further 30% of trips are within the Bromsgrove District area. This shows that a large number of commute trips have the potential to pass along or across the A38 corridor to reach the place of work, with some of the trips being of a longer distance.

This pattern of car dependency is important context for the A38 corridor enhancements, which seek to improve the strategic and local highway network to better cater for car trips, whilst also providing significantly improved facilities for pedestrians and cyclists across and along the A38 encourage better take up of sustainable modes.

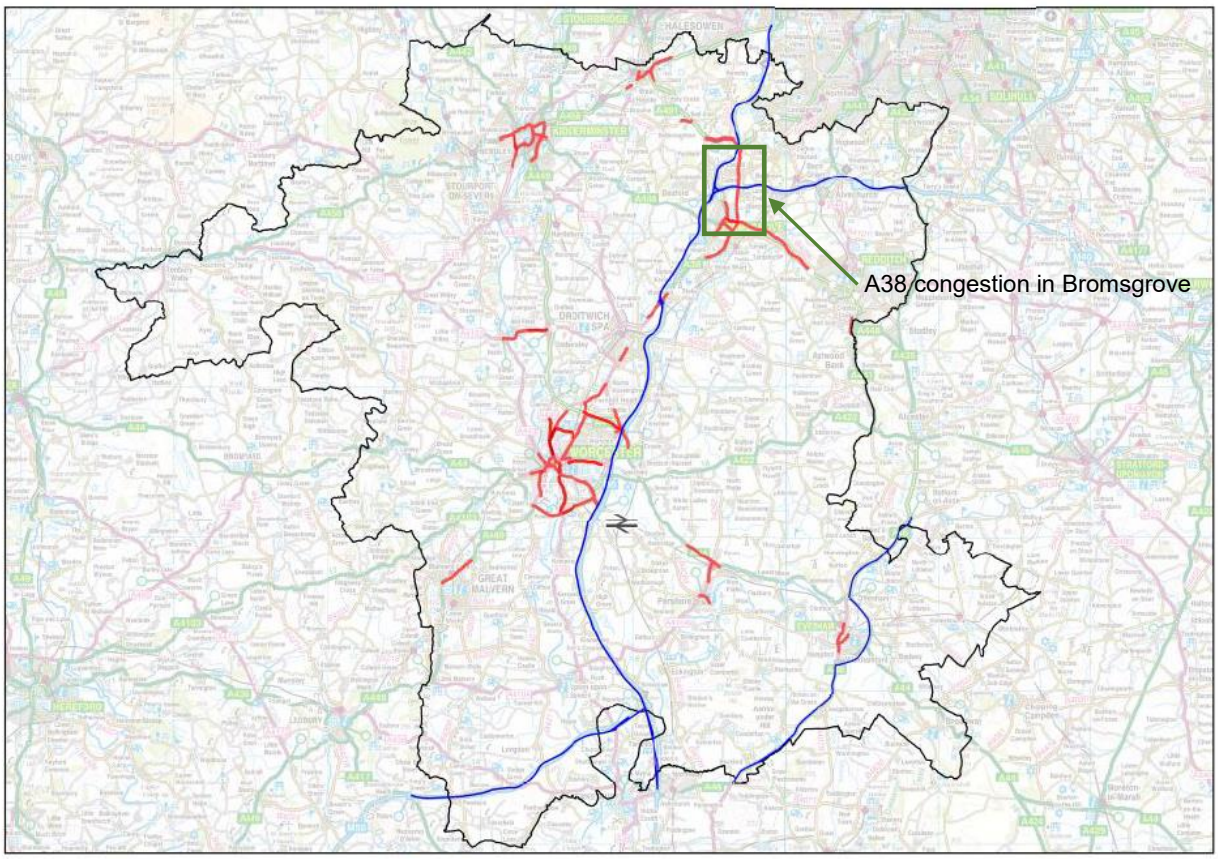
3.3.1.4 Congestion

The A38 corridor currently experiences significant weekday morning and evening peak congestion. This results in delays at junctions that in turn results in unreliable journey times. Ultimately, car dependency and high traffic flows on the A38 are hindering local movements within Bromsgrove and access to the SRN, specifically to the M5 and the M42.

The WLEP Strategic Economic Plan (SEP) recognises that 'access to and from the SRN is constrained in parts of the county due to capacity constraints on the local highway network, particularly around urban areas, with Worcester and Bromsgrove having particularly acute problems. It notes that constraining economic growth and investment in Worcestershire's transport infrastructure and services is essential to provide businesses with improved access to markets and employees as well as encouraging economic growth.

Figure 3.16, taken from the SEP, highlights that the A38 is recognised as a significant area of congestion within the County.

Figure 3.16 – Areas of congestion highlighted in the WSEP

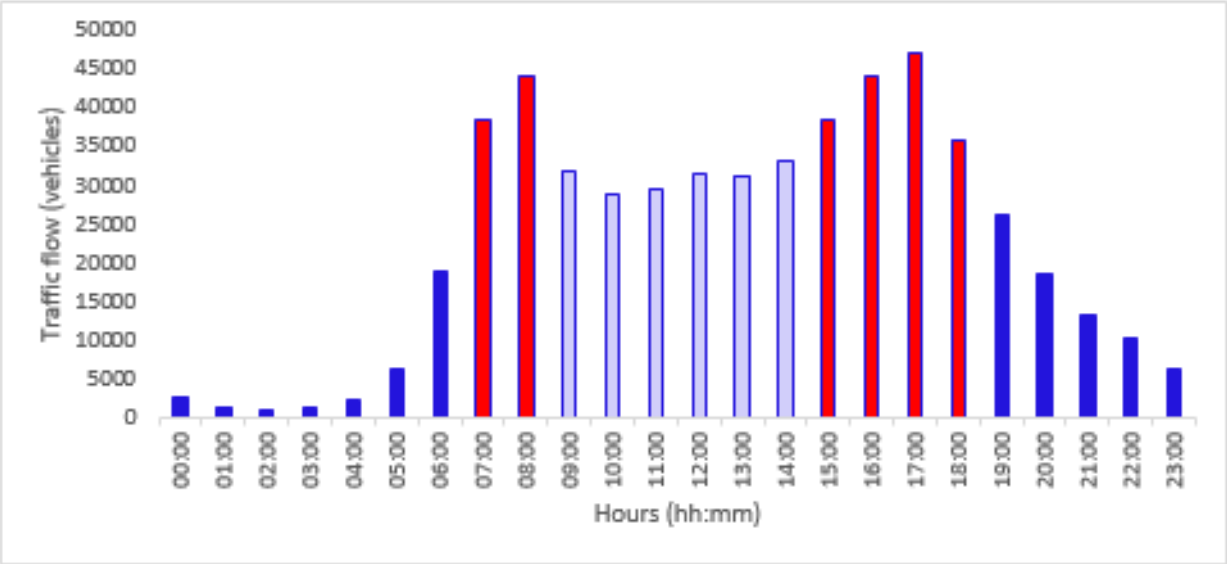


Source: Worcestershire County Council (2014)

3.3.1.5 Traffic Flows

Automatic Traffic Counters (ATC) between May and July 2017 shows that, whilst morning and evening peaks are evident, traffic levels remain high during the interpeak period (Figure 3.17).

Figure 3.17 - 2-way hourly traffic flow across all ATC sites Bromsgrove, May to July 2017



Whilst the traffic volumes on the corridor are high, these are generally within the design flow criteria for a route of this type. However, the corridor currently experiences significant weekday morning and evening peak congestion due to issues associated with the junctions. This results in delay and, in turn, unreliable journey times. Ultimately, this congestion hinders local movements within Bromsgrove and access to the Strategic Road Network, specifically to the M5 and the M42.

The modelled traffic volumes vary along the corridor, as shown in Figure 3.18 and Figure 3.19, where the highest volumes of traffic are to the north of the corridor.

Figure 3.18 - Modelled baseline traffic volume – AM peak

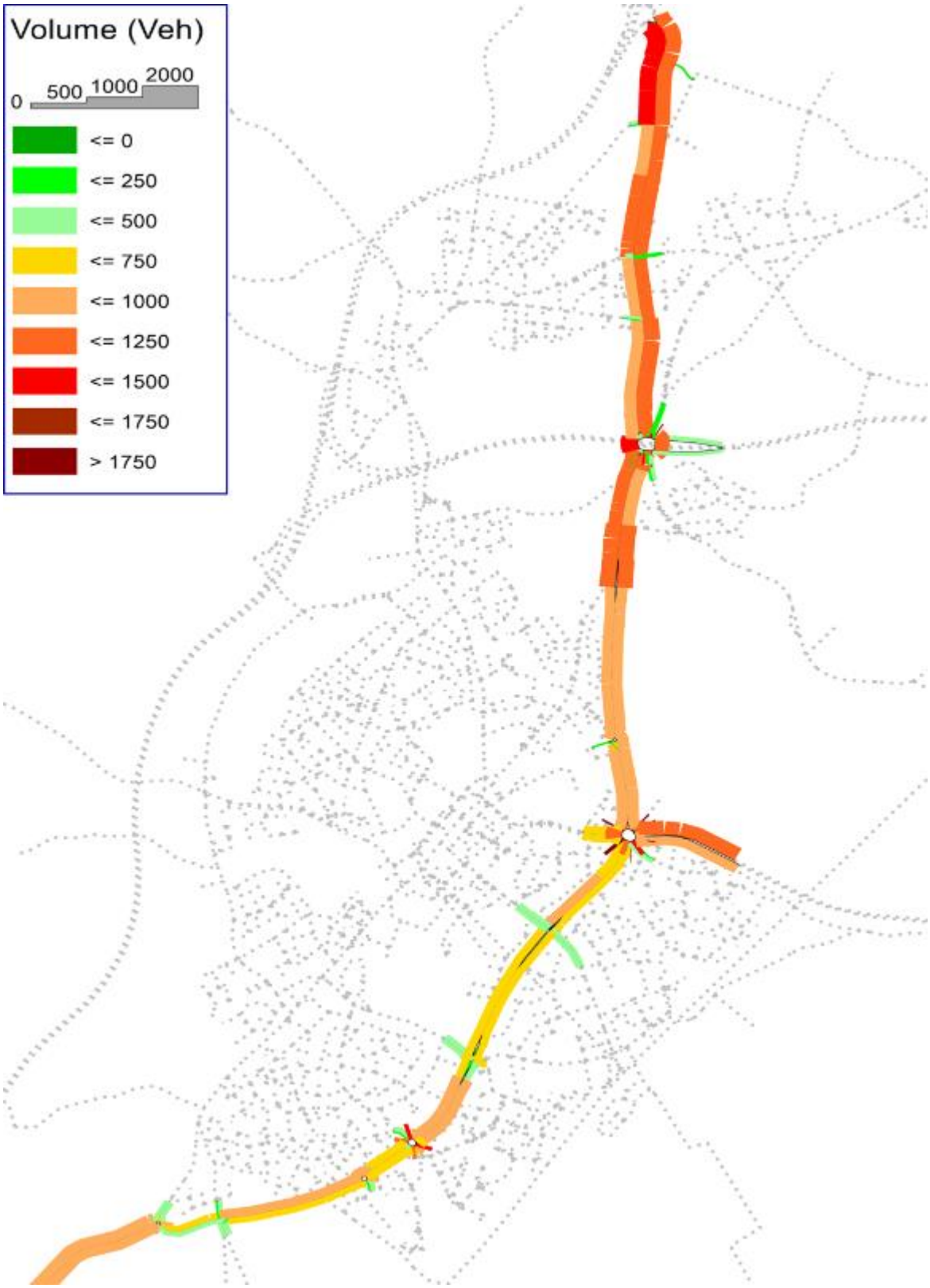
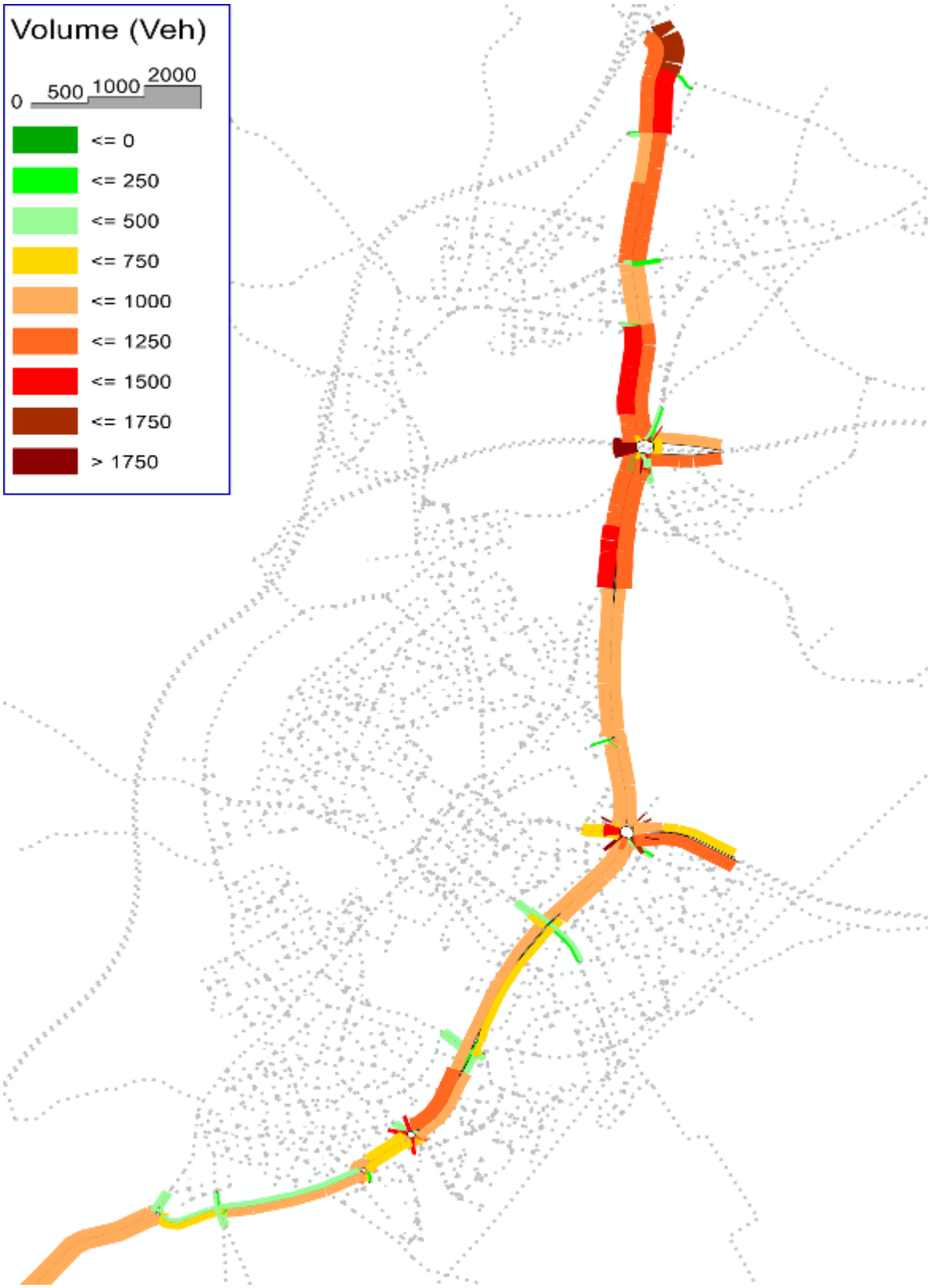


Figure 3.19 - Modelled baseline traffic volume – PM peak



3.3.1.6 Traffic Queues

Queue length surveys were undertaken in June 2017 for all A38 junctions within the study area, for all approaches over a 12-hour period (07:00-19:00). Figure 3.20 to Figure 3.27 show the observed maximum queue lengths for the seven signalised junctions on the A38 corridor in the AM Peak Period (07:00-10:00), with Figure 3.38 to Figure 3.35 showing the equivalent PM Peak Period (16:00-19:00).

In the 2017 scenario the seven signalised junctions are all MOVA controlled and therefore the green time splits and offsets are expected to dynamically change in each cycle depending on the volume of traffic on each approach to the junction. Therefore, the queues would be unlikely to clear in each cycle under congested conditions. This is reflected by the queue length variability demonstrated in the figures. The seven signal junctions are:

- A38 / Hanbury Road.
- A38 / Stoke Road / Charford Road.
- A38 / New Road.
- A38 / Birmingham Road.
- A38 / M42 Junction 1.
- A38 / Golden Cross Lane / Braces Lane.
- A38 / M5 Junction 4 (Outside of study area of A38 BREP scheme, and data not included in A38 BREP OAR).

Figure 3.20 - AM peak observed maximum queue lengths on A38 NB and SB – A38/Hanbury Rd Signalised Junction (June 2017 Survey)

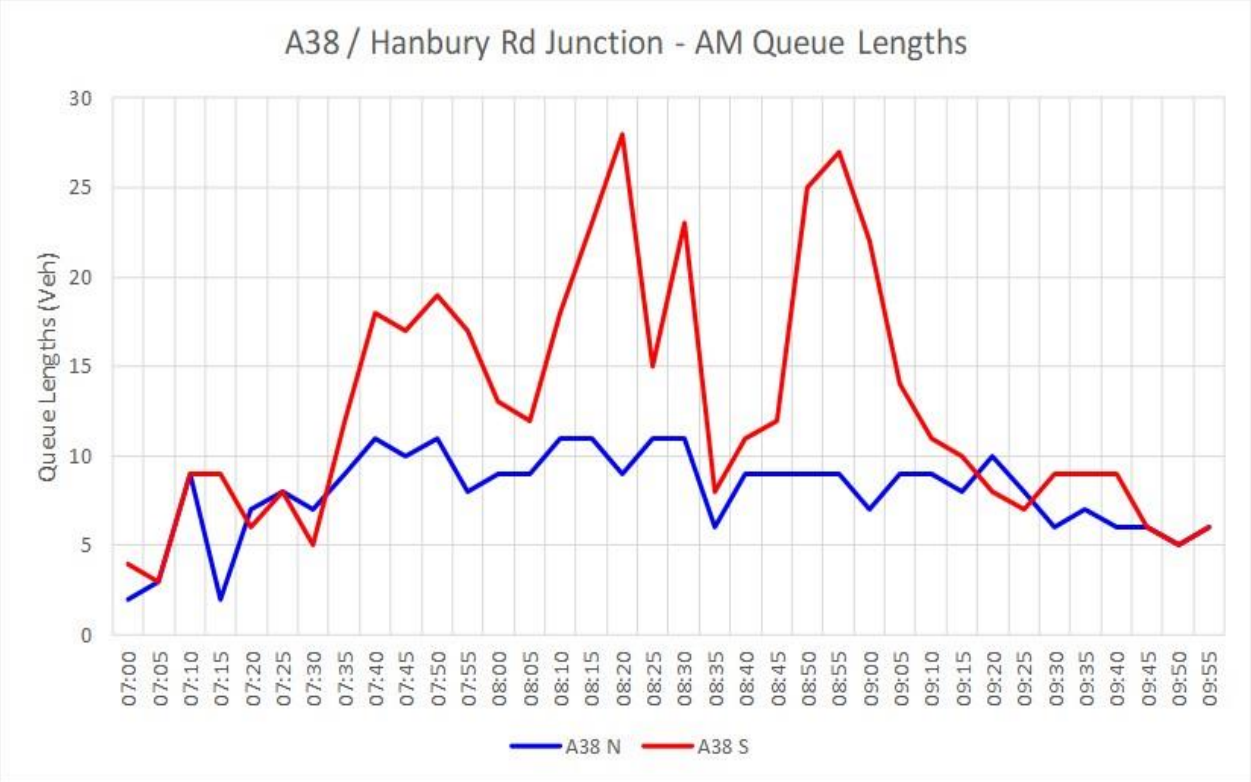


Figure 3.21 - AM peak observed maximum queue lengths on A38 NB and SB – A38/Stoke Rd/Charford Rd Signalised Junction (June 2017 Survey)

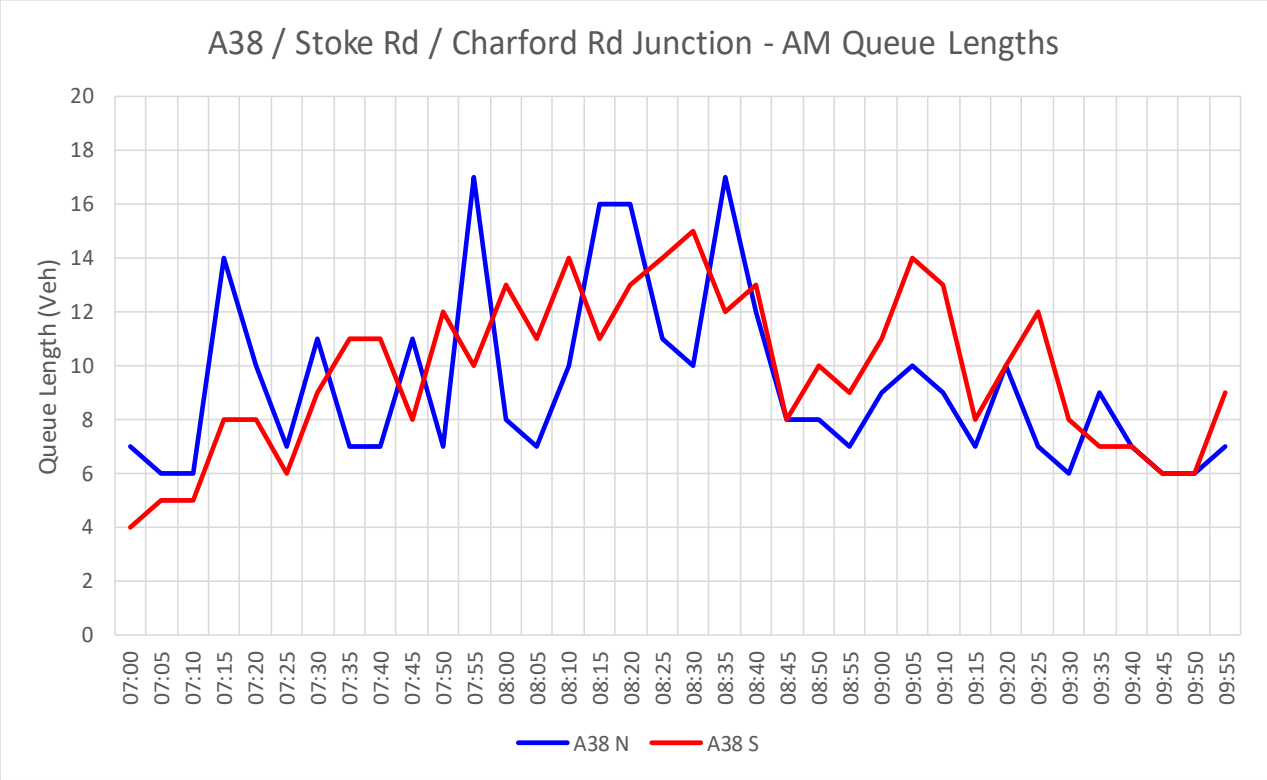


Figure 3.22 - AM peak observed maximum queue lengths on A38 NB and SB – A38/New Rd Signalised Junction (June 2017 Survey)

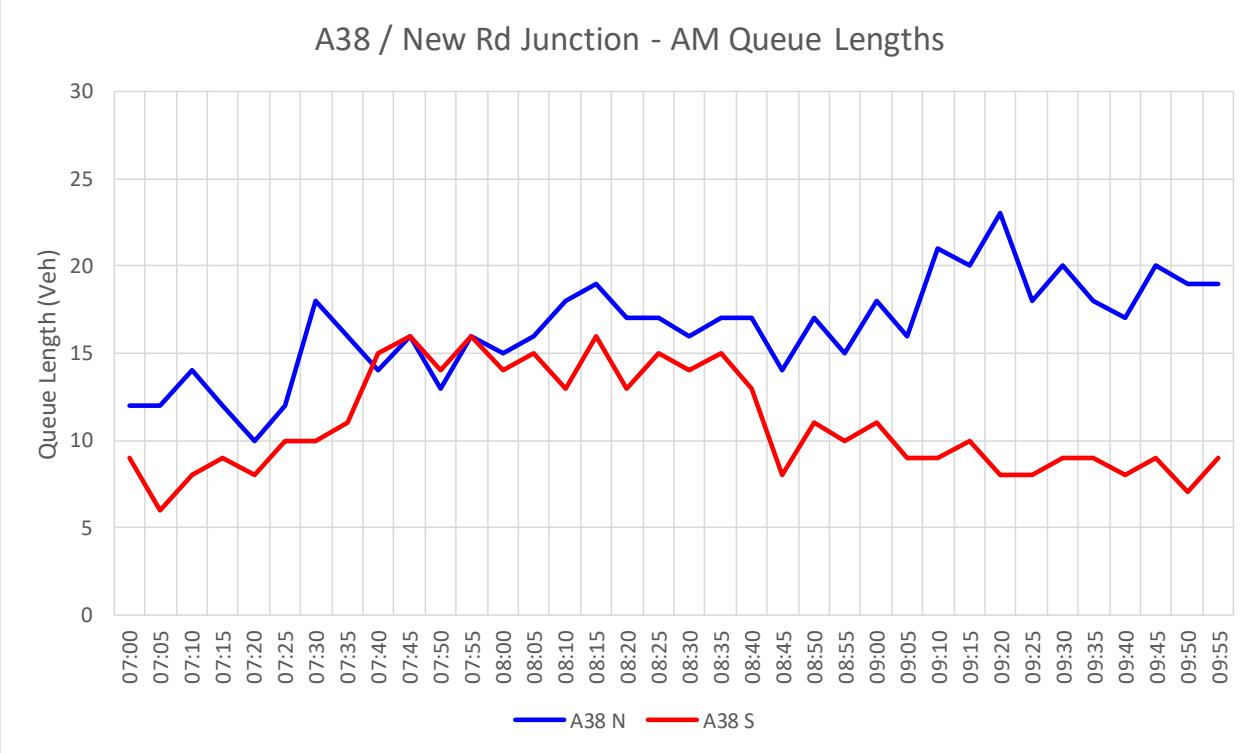


Figure 3.23 - AM peak observed maximum queue lengths on A38 NB and SB – A38/A448 Signalised Roundabout (June 2017 Survey)

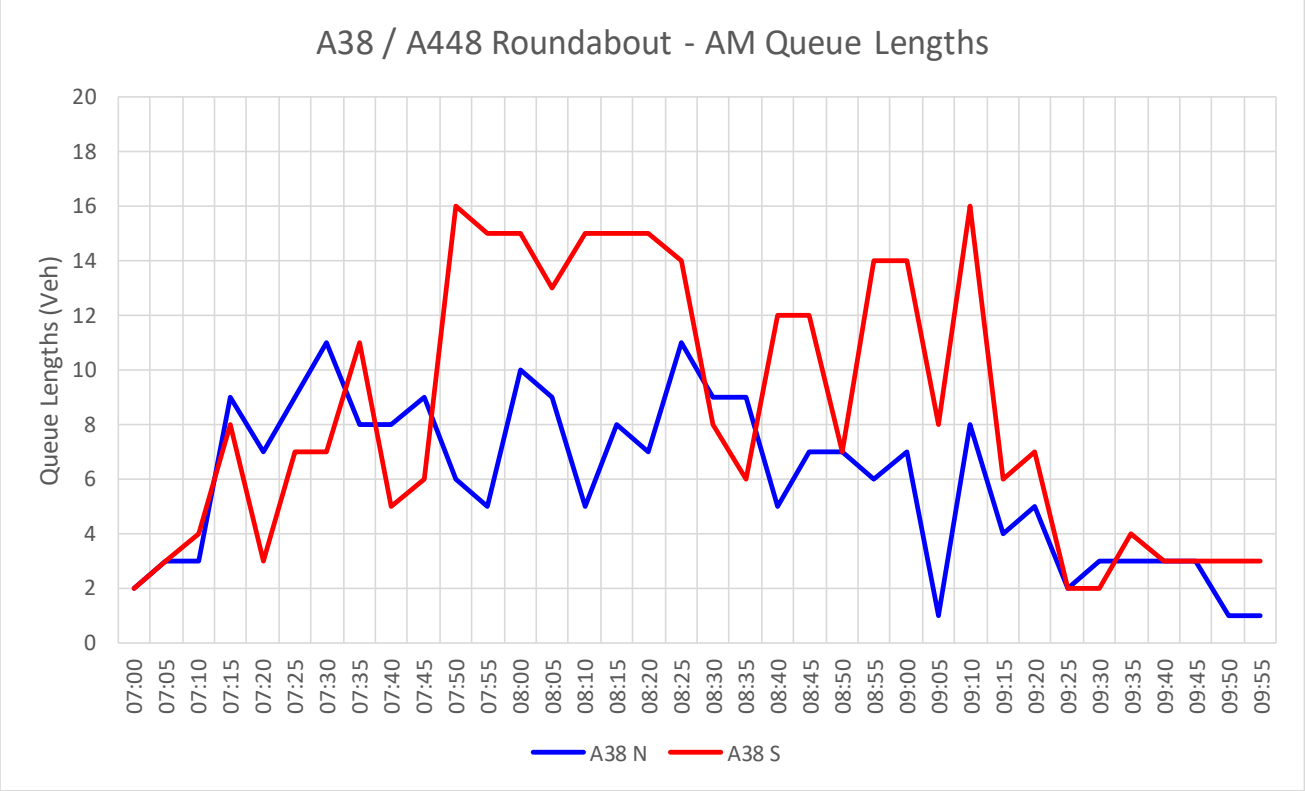


Figure 3.24 - AM peak observed maximum queue lengths on A38 NB and SB – A38/Birmingham Rd (June 2017 Survey)

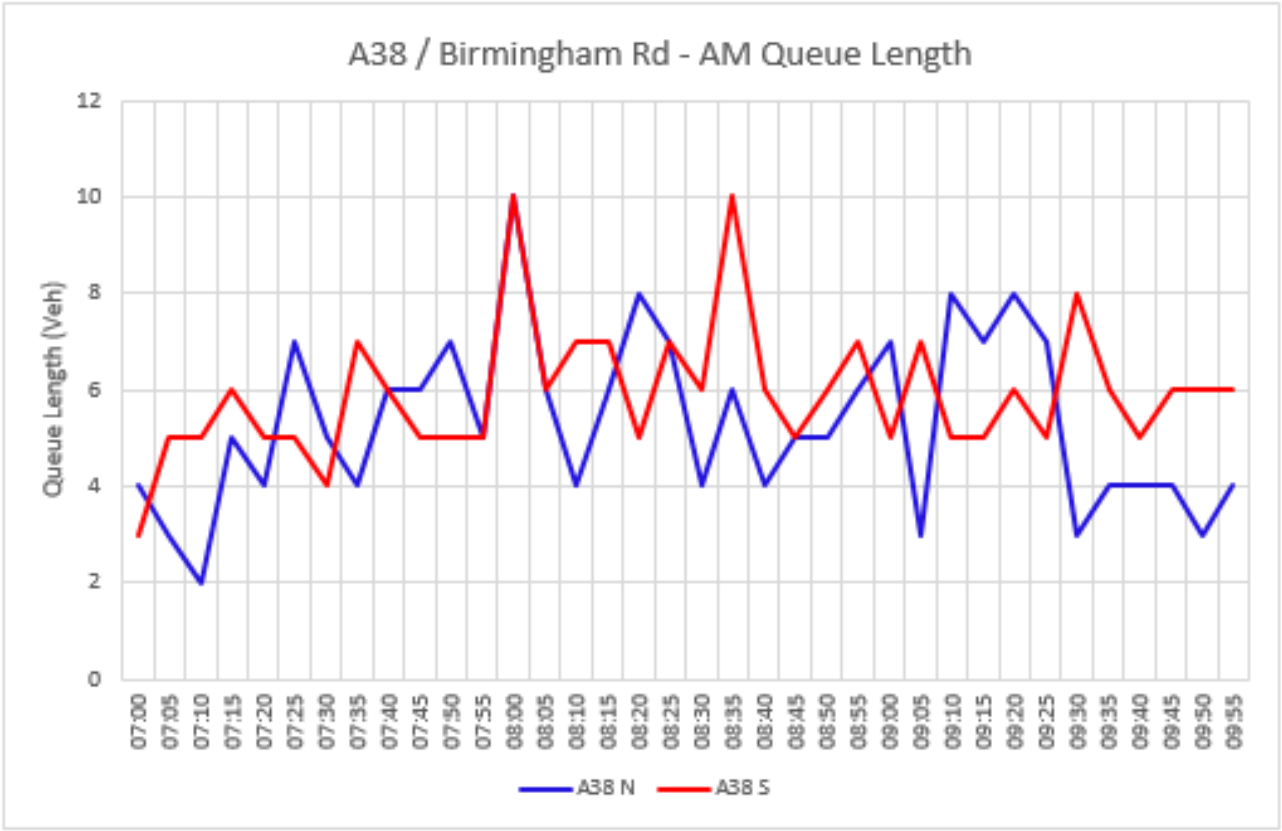


Figure 3.25 - AM peak observed maximum queue lengths on A38 NB and SB – M42 Junction 1 Signalised Junction (June 2017 Survey)

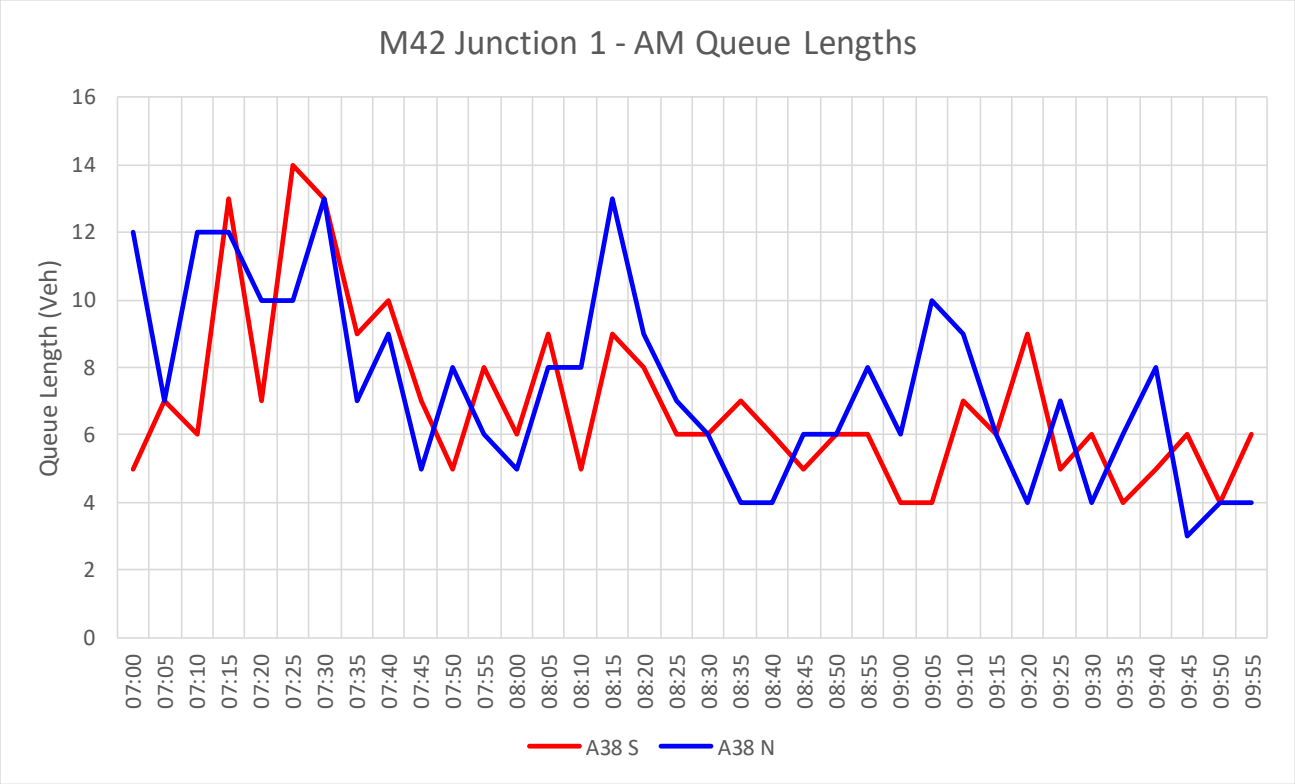


Figure 3.26 - AM peak observed maximum queue lengths on A38 NB and SB – A38/Golden Cross Ln/Braces Ln Signalised Junction (June 2017 Survey)

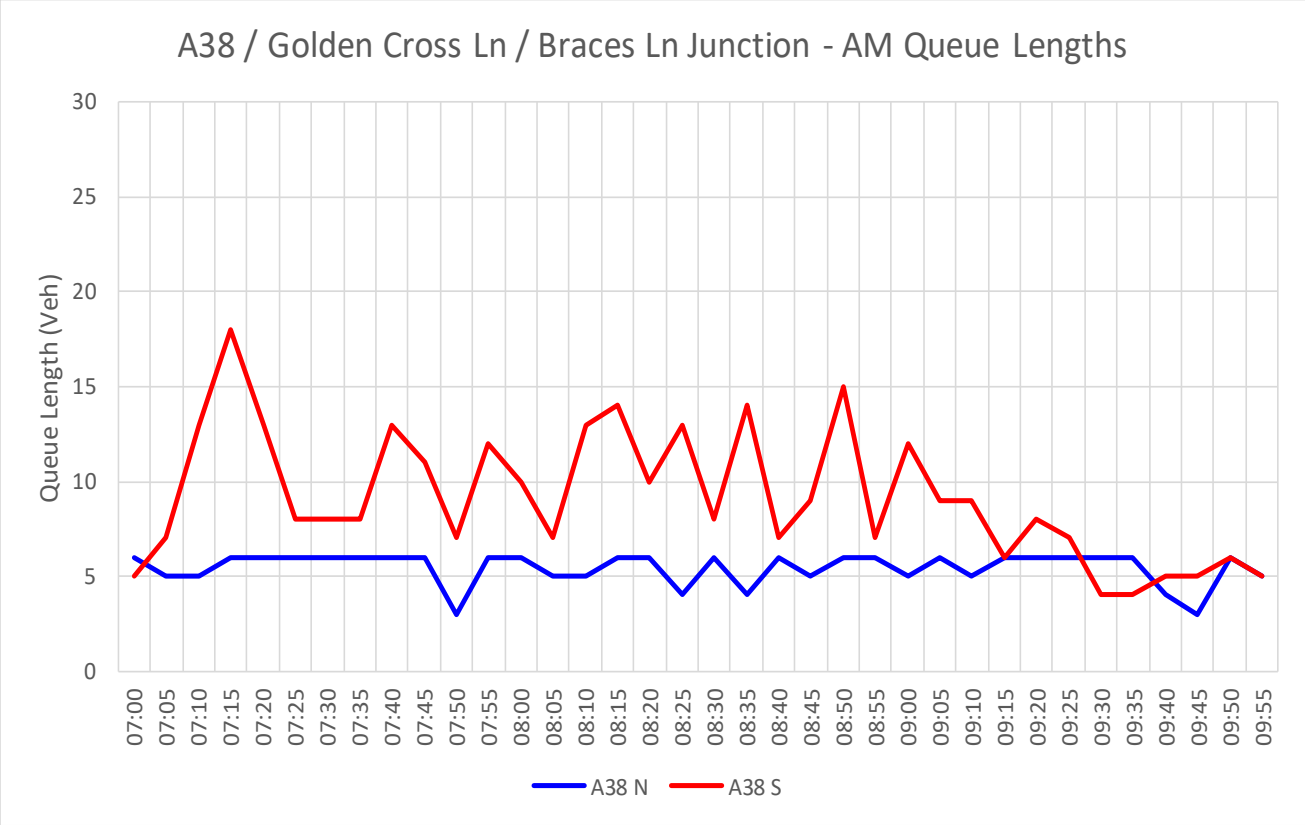


Figure 3.27 - AM peak observed maximum queue lengths on A38 NB and SB – M5 Junction 4 Signalised Junction (June 2017 Survey)

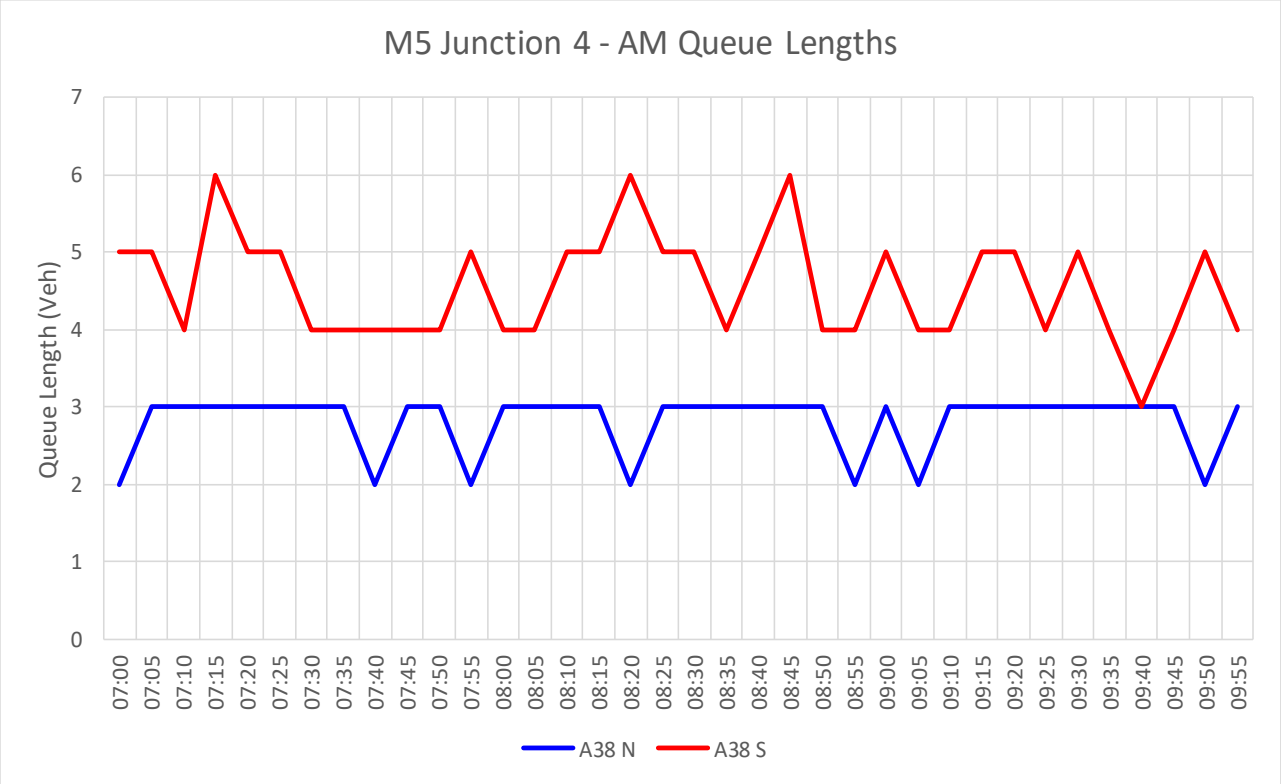


Figure 3.28 - PM peak observed maximum queue lengths on A38 NB and SB – A38/Hanbury Rd Signalised Junction (June 2017 Survey)

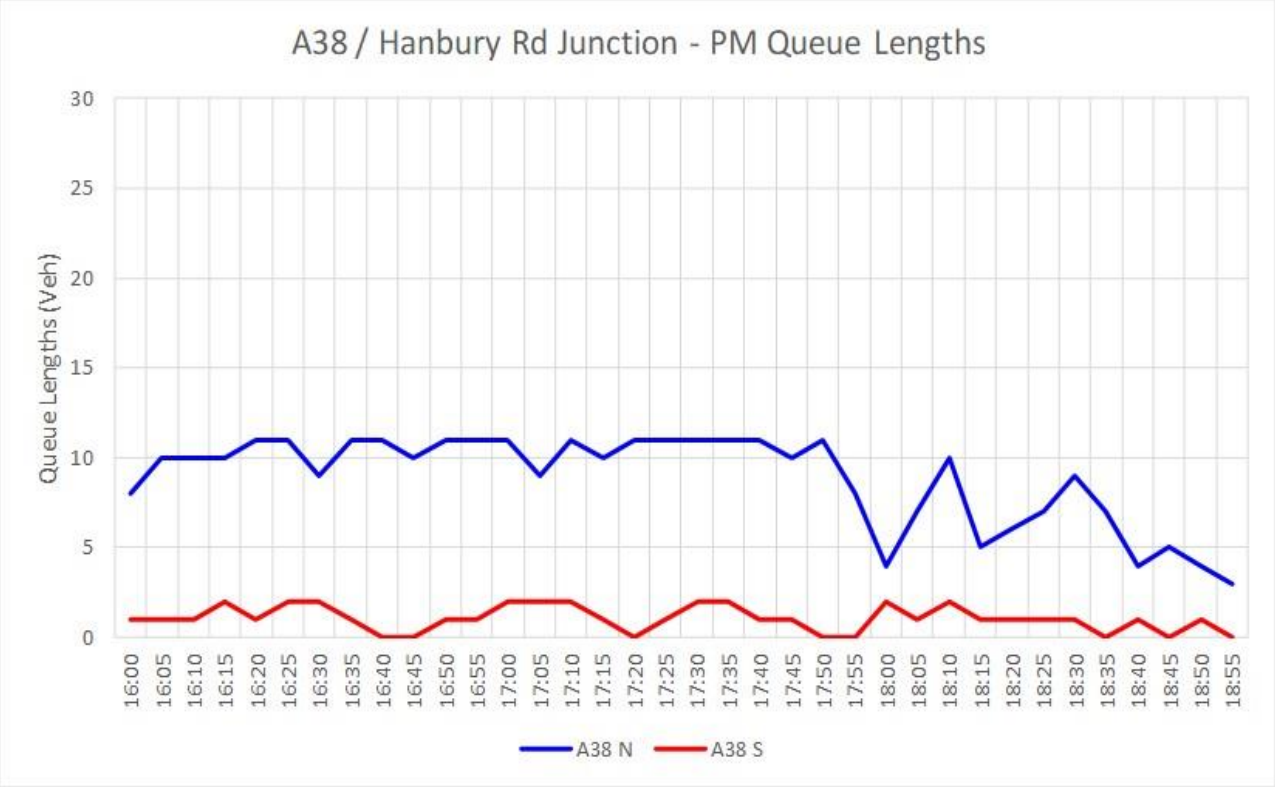


Figure 3.29 - PM peak observed maximum queue lengths on A38 NB and SB – A38/Stoke Rd/Charford Rd Signalised Junction (June 2017 Survey)

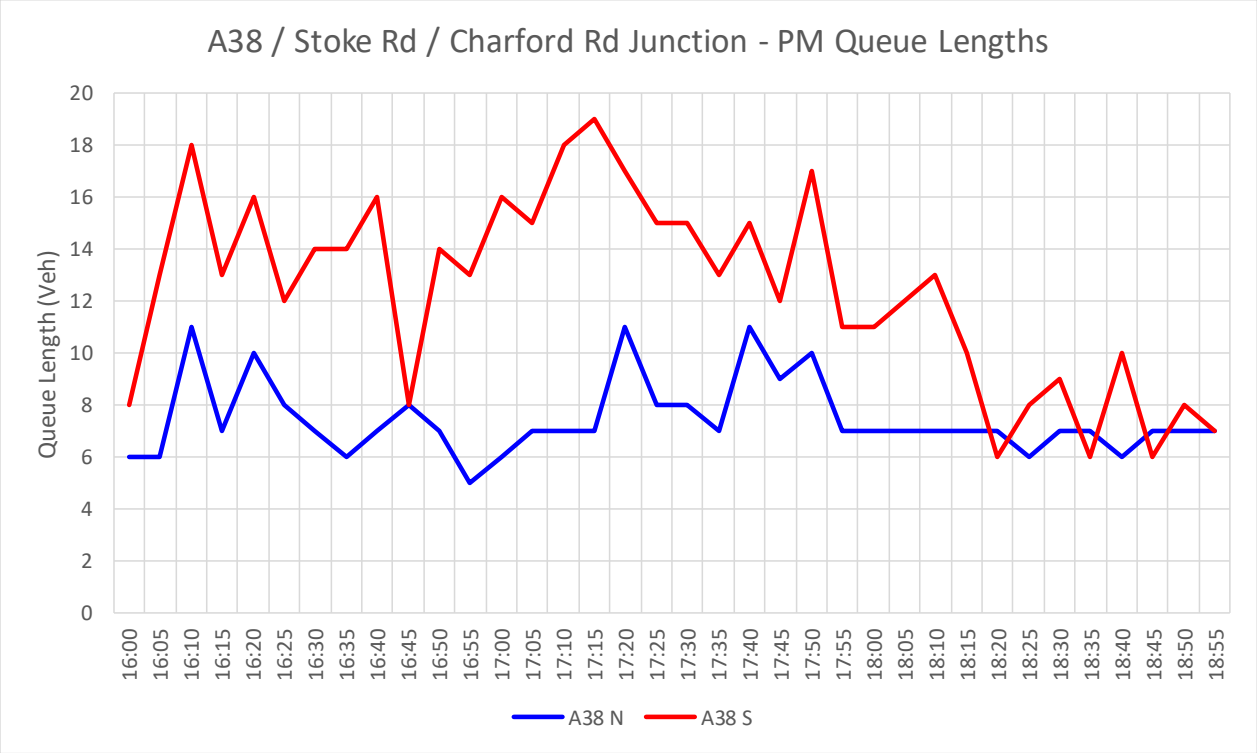


Figure 3.30 - PM peak observed maximum queue lengths on A38 NB and SB – A38/New Rd Signalised Junction (June 2017 Survey)

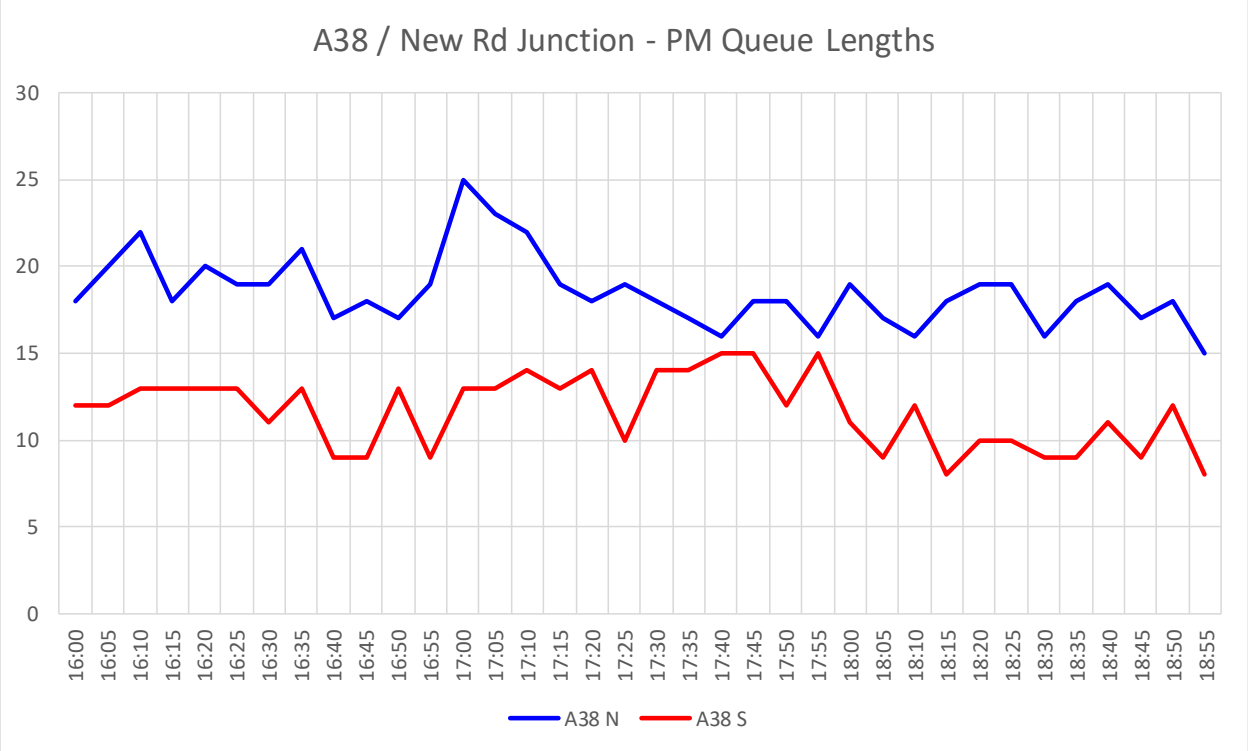


Figure 3.31 - PM peak observed maximum queue lengths on A38 NB and SB – A38/A448 Signalised Roundabout (June 2017 Survey)

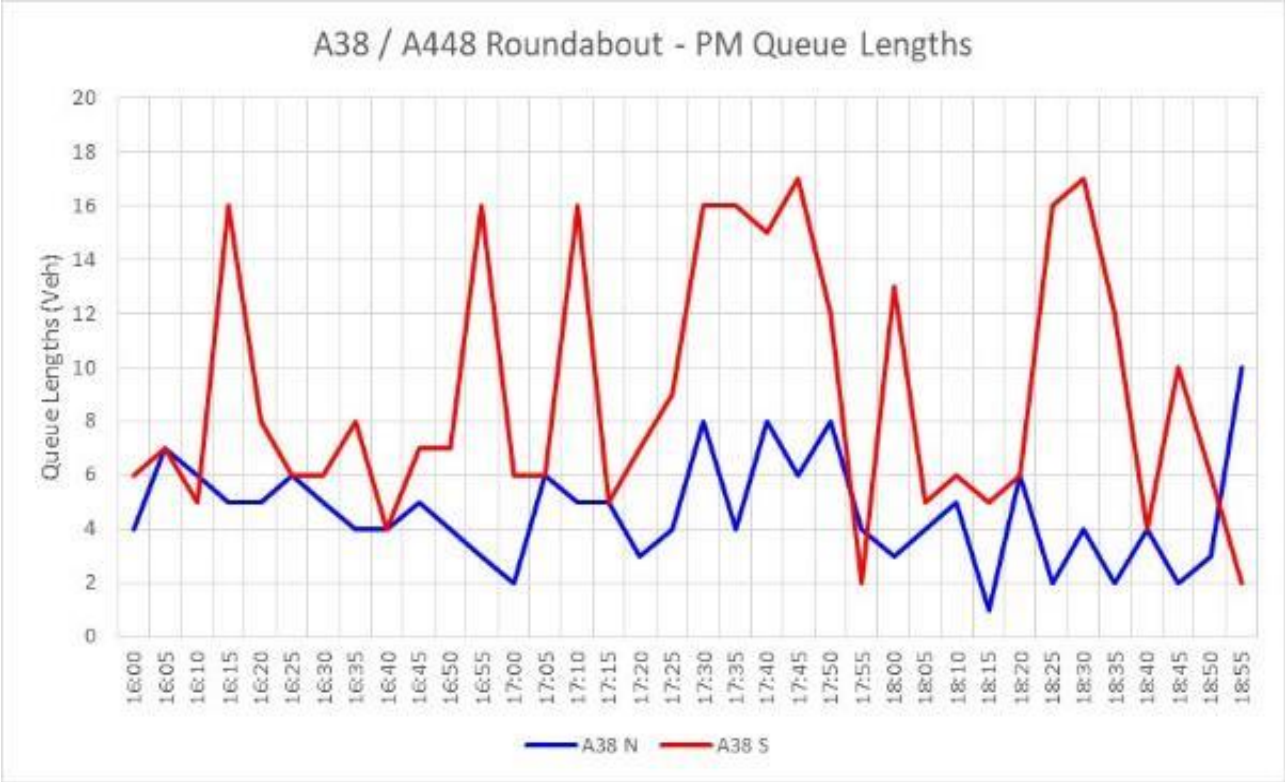


Figure 3.32 - PM peak observed maximum queue lengths on A38 NB and SB – A38 Birmingham Rd Signalised Junction (June 2017 Survey)

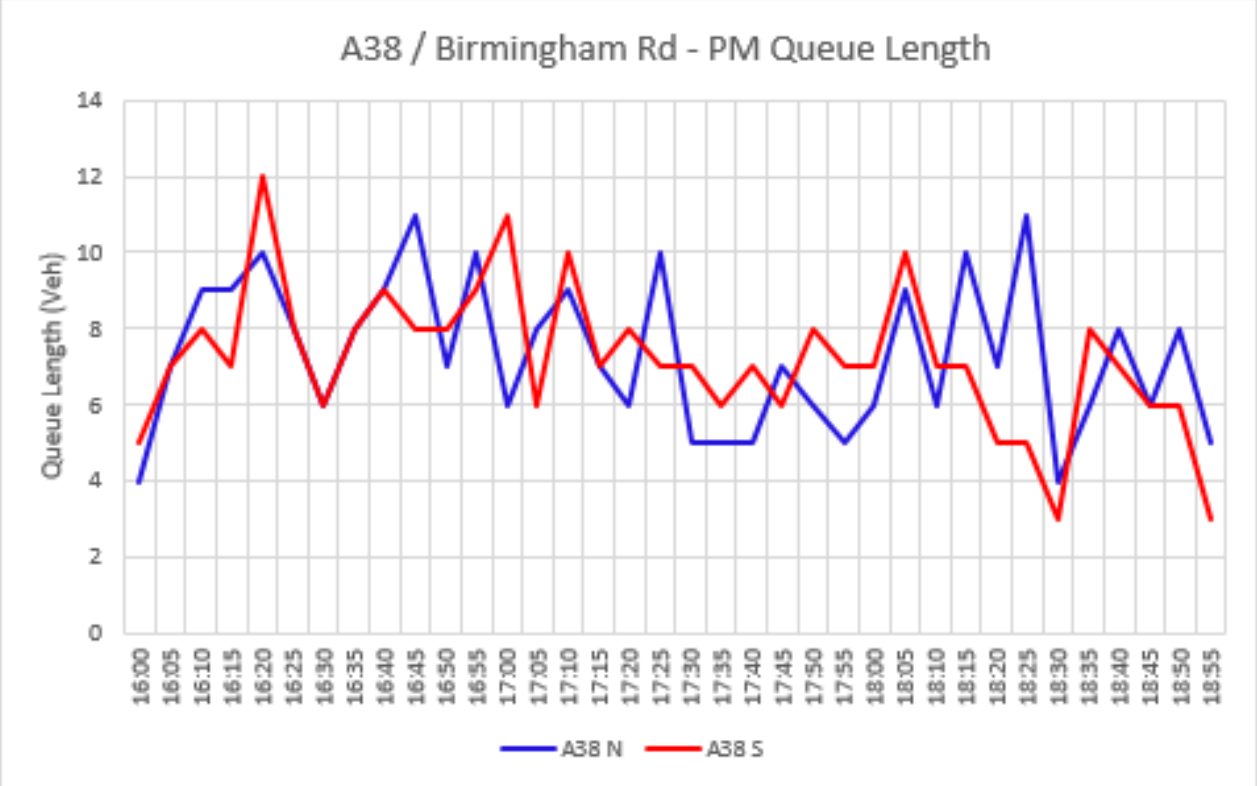


Figure 3.33 - PM peak observed maximum queue lengths on A38 NB and SB – M42 Junction 1 Signalised Junction (June 2017 Survey)

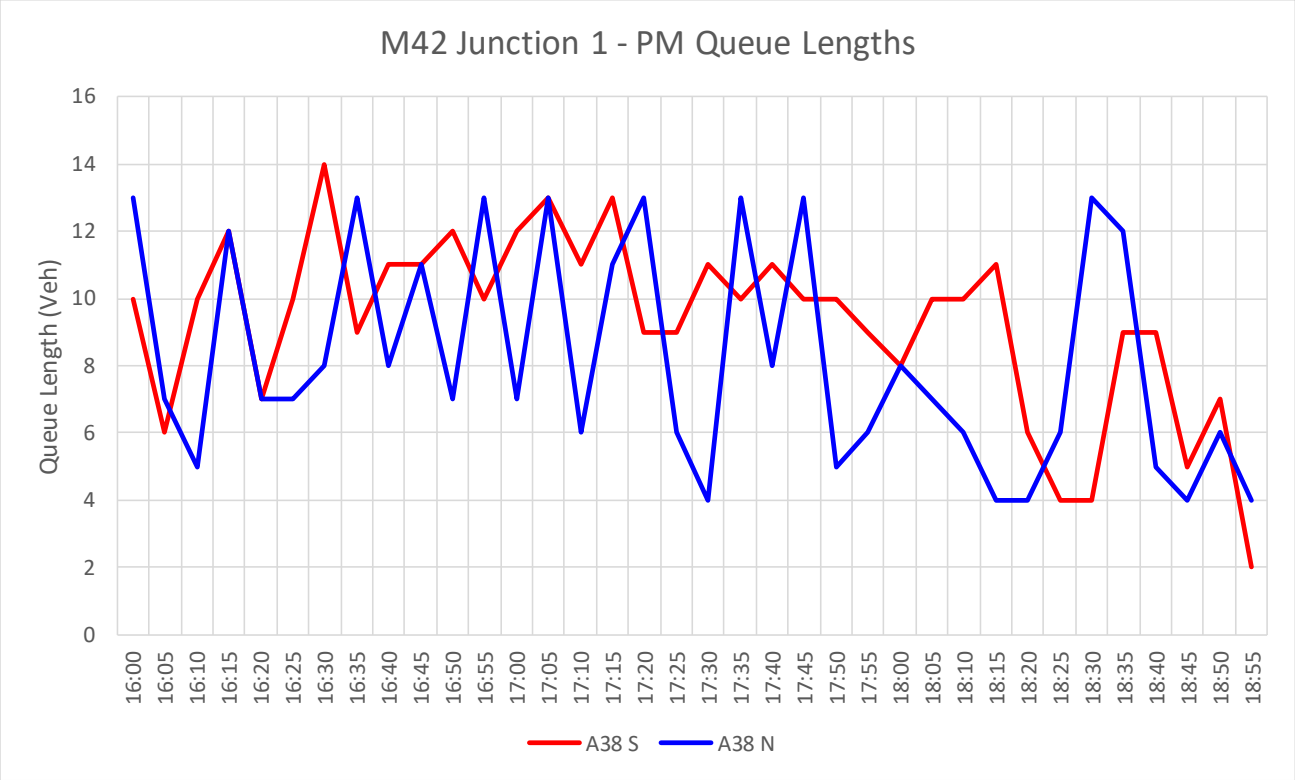


Figure 3.34 - PM peak observed maximum queue lengths on A38 NB and SB – A38/Golden Cross Ln/Braces Ln Signalised Junction (June 2017 Survey)

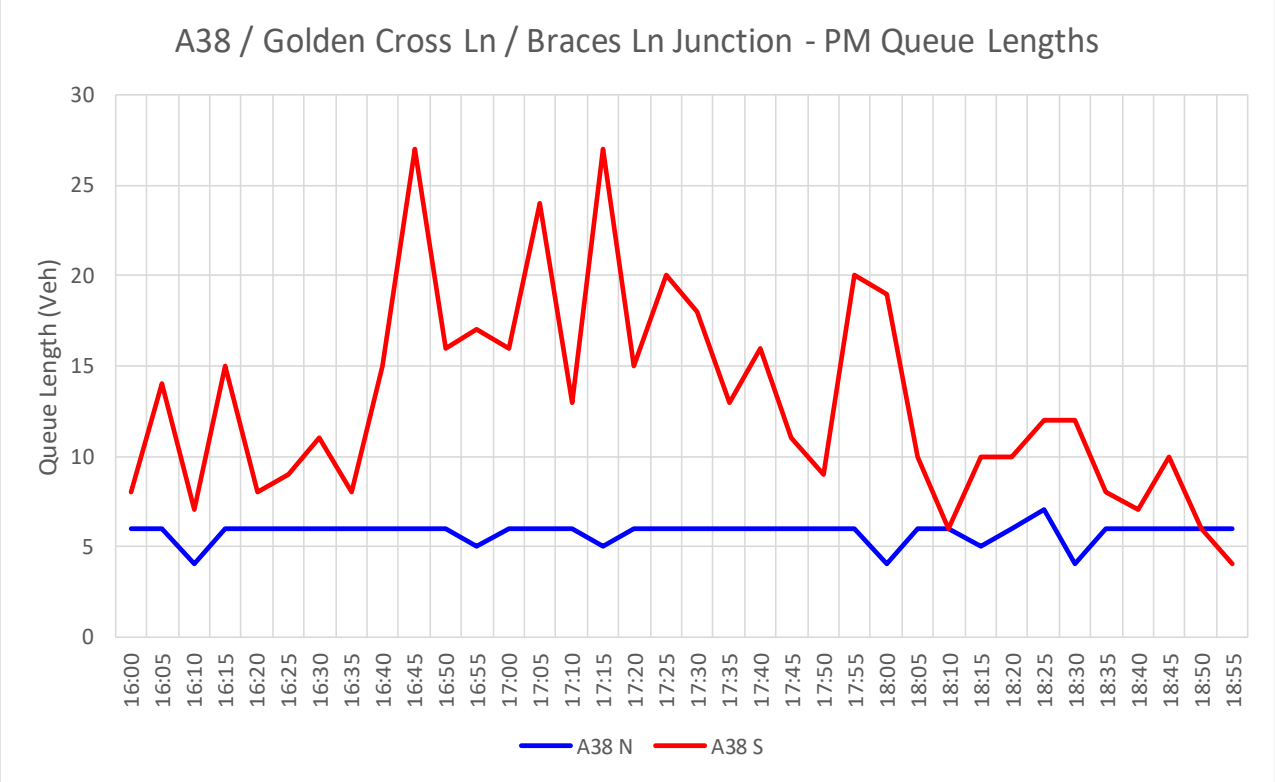
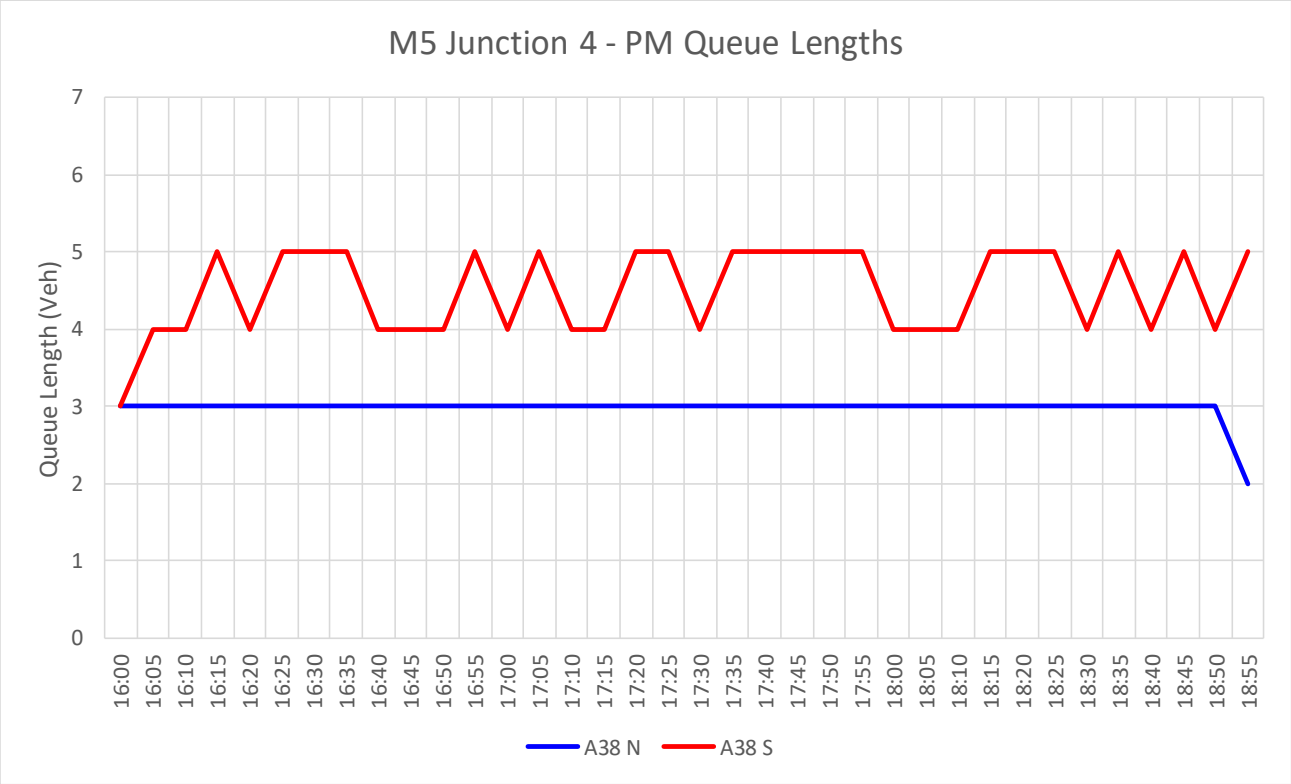


Figure 3.35 - PM peak observed maximum queue lengths on A38 NB and SB – M5 Junction 4 Signalised Junction (June 2017 Survey)



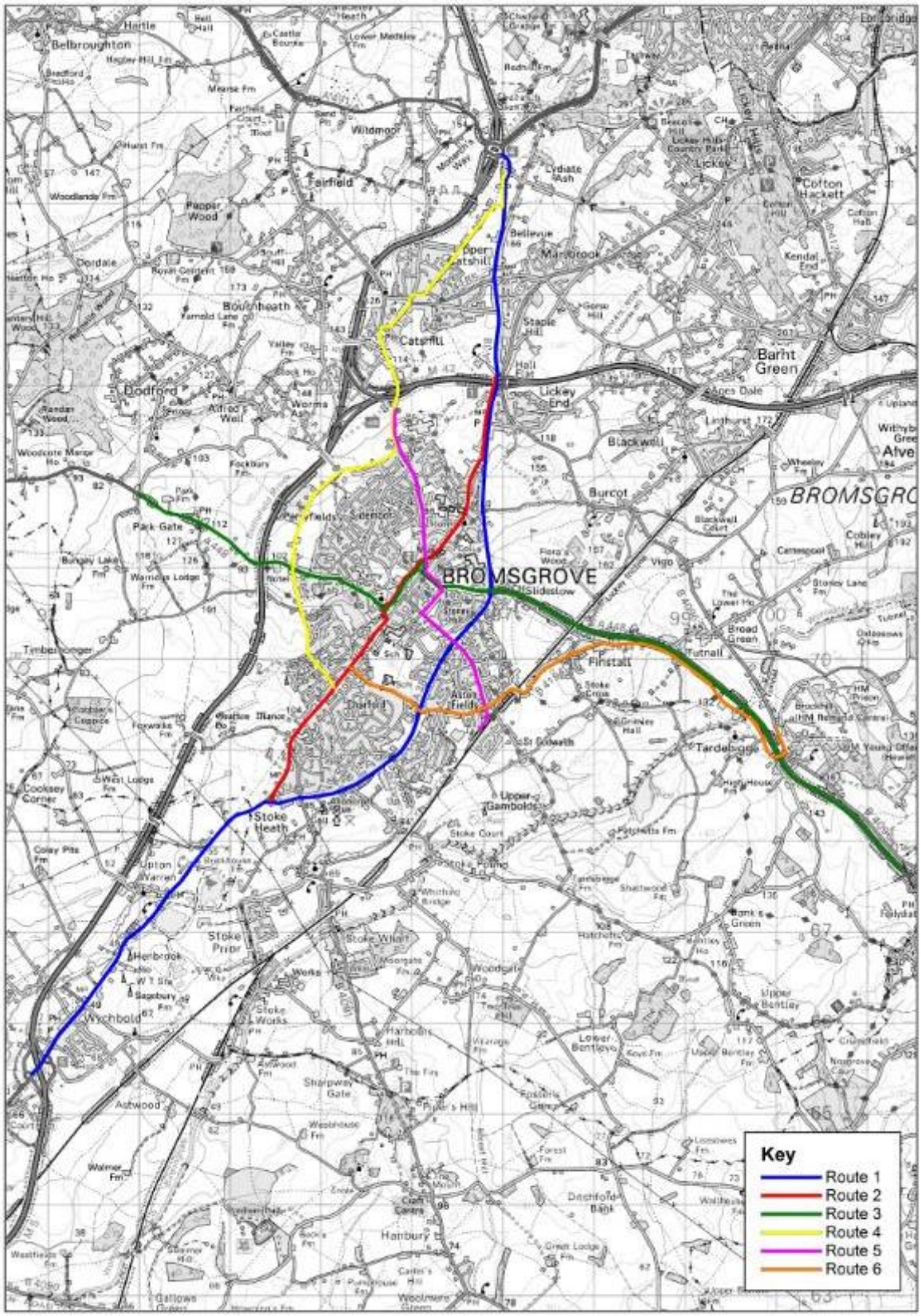
3.3.1.7 *Journey Time*

Delay along the corridor is reported via the journey time surveys undertaken in June 2017. The journey time data shows a significant variance in travel. The Journey time data was collected in both directions along six routes. The routes surveyed are given below (Table 3.16) and shown in Figure 3.36. Each route was surveyed over a minimum of two days and at least ten return journeys were undertaken in each direction in each time period (08:00 to 09:00, 09:00 to 15:00 and 17:00 to 18:00).

Table 3.16 - Journey time (JT) routes

JT Route	Routing
1	M5 Junction 4 to M5 Junction 5, along the A38, via M42 Junction 1 and A38 / A448 roundabout
2	A38 / Birmingham Road junction to A38 / B4084 Worcester Road junction, along Birmingham Road, A448 Market Street and B4091 Rock Hill, via Bromsgrove Town Centre
3	A448 Kidderminster Road / Fockbury Road junction to A448 Bromsgrove Highway / B4096 Hewell Lane junction, along the A448, via Bromsgrove Town Centre
4	A38 / Woodrow Lane junction to B4091 Rock Hill / Fox Lane junction, along Woodrow Lane, B4091 Stourbridge Road, Perryfields Road and Whitford Road
5	B4091 Stourbridge Road (from Perryfields Road junction) and B4184 New Road (to Bromsgrove station) via Town Centre, A448 Stratford Road and College Road
6	Charford Road (from B4019 Rock Hill junction), Stoke Road and B4184 Finstall Road (to the B4096 Hewell Lane), via the A38 junction

Figure 3.36 - Journey time routes



The journey time datasets from the 2017 survey were checked and analysed, to remove obvious outliers in the raw data. The observed mean journey time data are presented in Table 3.17.

Table 3.17 - Observed Mean journey times (mm:ss)

Route	Length (km)	AM	IP	PM
Route 1 NB	12.4	20:44	17:37	23:08
Route 1 SB	12.5	22:17	17:52	21:52
Route 2 NB	4.6	13:10	13:44	15:24
Route 2 SB	4.6	12:49	10:11	12:07
Route 3 EB	10.4	17:02	17:31	16:30
Route 3 WB	10.4	14:54	14:33	16:57
Route 4 NB	6.8	13:58	10:49	14:43
Route 4 SB	6.8	16:38	10:58	12:31
Route 5 NB	3.5	11:58	09:58	12:17
Route 5 SB	3.5	14:32	07:52	13:07
Route 6 EB	5.9	10:29	08:20	09:27
Route 6 WB	5.9	11:36	08:19	09:36

Time distance charts of the journey time data are presented in Figure 3.37 and Figure 3.38 for Route 1 on the A38, further figures for other routes are contained in the Traffic Data Collection Report (Appendix TM.2).

For southbound movements journeys in both the AM and PM peak periods take around 5 minutes longer than during the interpeak. In the northbound direction this difference is more pronounced, particularly in the PM peak when journeys take around 6 minutes longer than in the interpeak.

The two figures show that journey time is highest during the PM period in the Northbound and very similar during AM and PM time in the Southbound. It shows that:

- Northbound, A38 / Sherwood Road during the PM peak period is where journey time starts to increase, affecting journey time along the A38 corridor, whereas in the AM peak period, journey time increases at A38/ New Road junction (TS) result in longer queues.
- Southbound A38/ New Road and A38/ Hanbury Road junctions. Both intersections are traffic signalled junctions and present the most significant queues along the A38 corridor.

Figure 3.37 - Cumulative journey times on the A38 corridor, taken from June 2017 journey time surveys (Northbound)

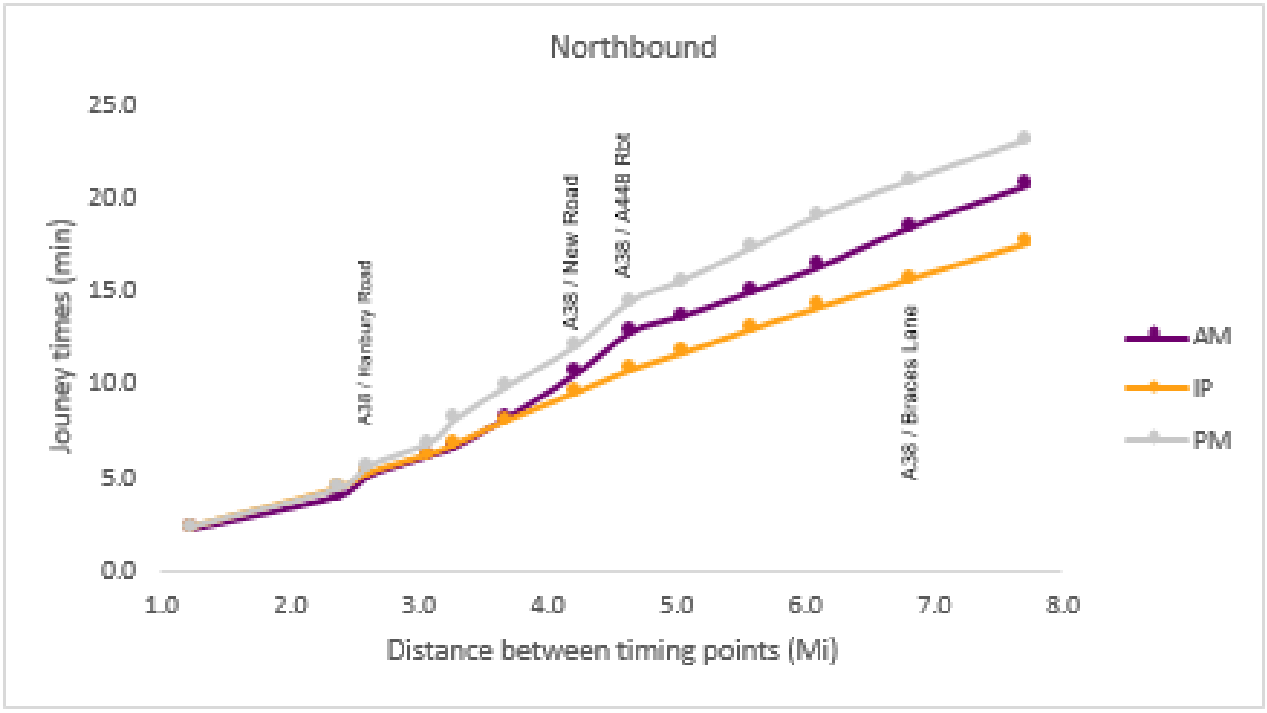
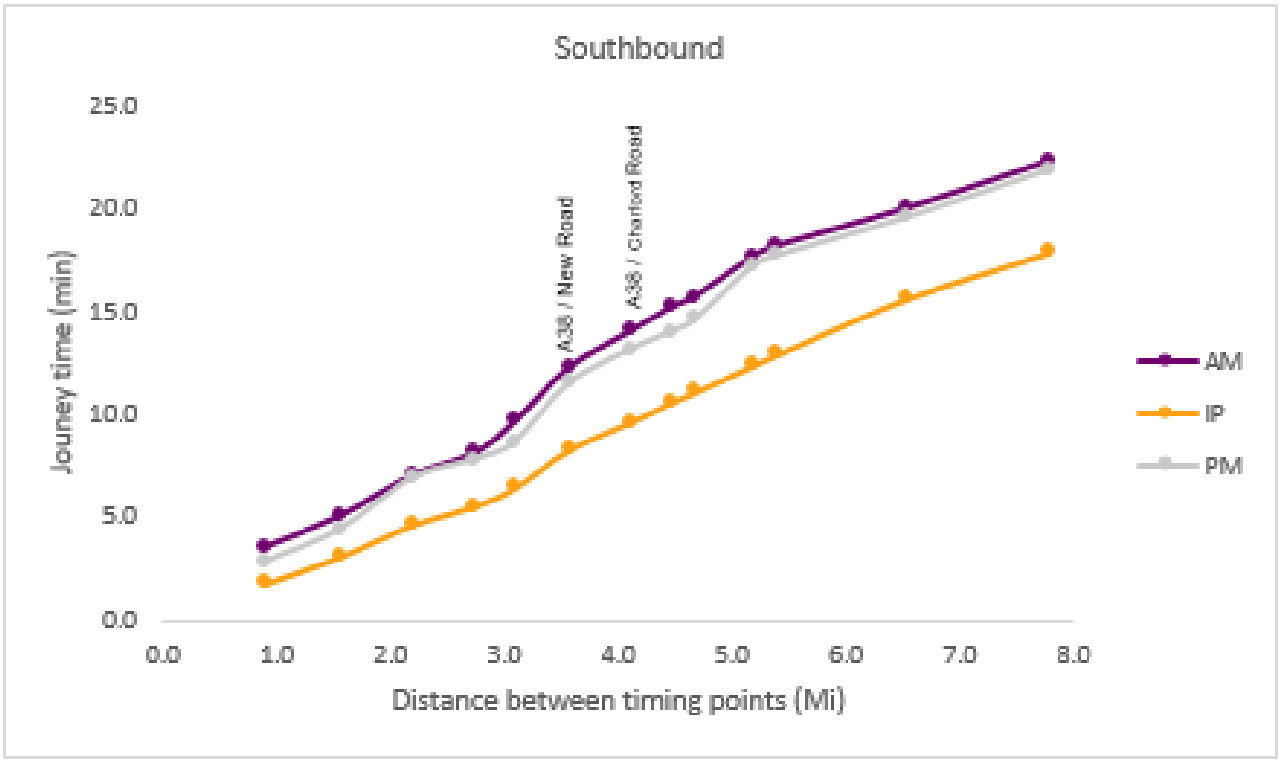


Figure 3.38 - Cumulative journey times on the A38 corridor, taken from June 2017 journey time surveys (Southbound)



Analysis of ATC demand data, manual queue survey data and tracked vehicle journey time data (taken from June 2017 surveys) shows that:

- Peak hour link flows on the A38 corridor are typically more than 20%-40% higher than the inter-peak.
- Delays are experienced at various junctions along the A38. Queue length data collected in June 2017 showed that queues were longest:
  - On the A38 southbound at the junction with Hanbury Road, with more than 25 vehicles during parts of the morning peak.
  - On the A38 northbound at the junction with New Road, with more than 20 vehicles during parts of both the morning and evening peak.
  - On the A38 southbound at the junction with Golden Cross Lane and Braces Lane, with more than 20 vehicles during parts of the evening peak.
  - On the A38 southbound at the junctions with the A448 and at the junction with Stoke Road and Charford Road with 16 – 18 vehicles during the evening peak.
- Journey time is impacted by delays, which are generally more pronounced in the AM/PM peaks toward the northern end of the A38 corridor, north of the Buntsford Drive roundabout. For southbound movements journeys in both the AM and PM peak periods take around 5 minutes longer than during the interpeak. In the northbound direction this difference is more pronounced, particularly in the PM peak when journeys take around 6 minutes longer than in the interpeak.

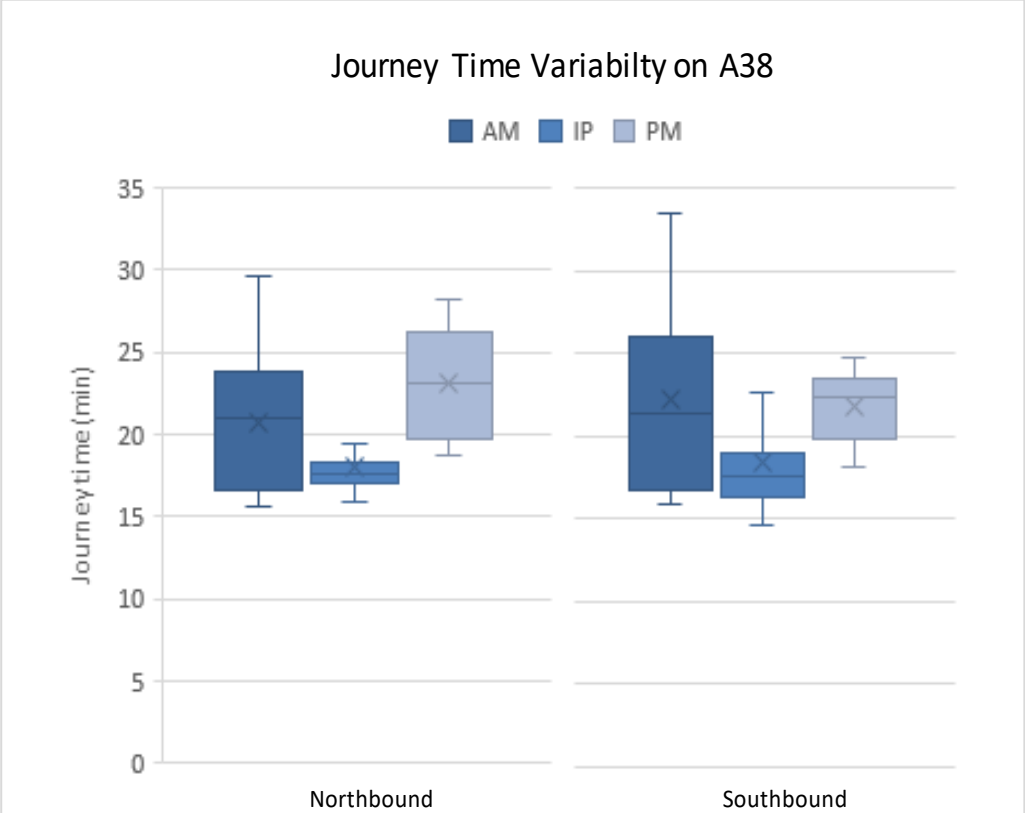
These factors all indicate that the high demand is exceeding capacity, which is resulting in high levels of congestion.

3.3.1.8 Reliability and Resilience

The journey time surveys undertaken in 2017 took samples across the route over two days. This data, shown in Figure 3.39, revealed particularly variable journey times, which indicates low journey time reliability. Most notably, it can be observed that the AM peak journey times ranged from 16.0 minutes to 33.5 minutes in the southbound direction, whereas the range was much tighter in the IP period.

For each box on the plot the highest value and lowest values are indicated by short lines. The three lines forming the box are plotted at the lower quartile (25th percentile) the Upper quartile (75th percentile) and the median (50th percentile). The mean value is depicted with an ‘x’. The middle 50% of the observed data is contained within the box.

Figure 3.39 – Box plot showing variability of 2017 journey time survey



Current levels of congestion and poor journey time reliability indicate that the A38 is close to capacity, so it is unlikely that the A38 is resilient in the case of an incident.

Additionally, the A38 offers an alternative route for strategic traffic in the case of blockage on the M5. The same issues of congestion and reliability indicate that the A38 does not provide high levels of resilience for the SRN.

The statistical analysis of Route 1 as per the information contained in the Traffic Data Collection Report is set out Table 3.18.

Table 3.18 – Statistical analysis – Route 1 journey time data

Time	NB AM	NB IP	NB PM	SB AM	SB IP	SB PM
n	10	30	10	10	33	10
Mean (M)	20:44	17:37	23:08	22:17	17:52	21:52
Standard Deviation (SD)	04:24	00:55	03:26	05:33	02:38	02:16
Coefficient of Variation (SD/M)	21%	5%	15%	25%	15%	10%
t	2.2620	2.0450	2.2620	2.2622	2.0369	2.2622
Interval (+/-)	23:53	17:58	25:36	26:15	18:48	23:29
Interval (+/-)	17:35	17:17	20:41	18:19	16:56	20:14
Accuracy	15.2%	1.9%	10.6%	17.8%	5.2%	7.4%

Unreliable journey times impact on the role of the corridor as a strategic link for accessing the SRN, urban areas and key employment areas south of Birmingham. Local trips may use local roads (such as Birmingham Road through the town centre and Perryfields Road/Whitford Road) rather than the A38 if journey times are less reliable than the local routes, leading to an increase of traffic using non-strategic routes for strategic journeys.

3.3.1.9 A38 As a Strategic Road Network Diversion Route

This section sets out information that has been received from NH with regards to the frequency of M5 or M42 issues, in which traffic would be diverted onto the A38 MRN corridor between M5 Junctions 4 and 5. The section sets out information on collisions, planned closures and unplanned closures.

3.3.1.9.1 Collision Based Incidents

Collision data was collected for a 5-year period (September 2016 to February 2021) along the M5 and M42 motorways. The data was provided by NH.

There are clusters of collisions at various junctions along the corridor, including:

- M5 Northbound between Junction 4A and Junction 4.
- M5 Southbound between Junction 4 and Junction 4A.
- M5 Southbound between Junction 4A and Junction 5.

No cluster of collisions are observed along M42 motorway.

The collision data is shown in Figure 3.40 and Table 3.19, and it refers to the number of collisions occurred on M5 and M42 during planned and unplanned events.

Figure 3.40 - Motorway collisions (M5/M42) (Source: NH)

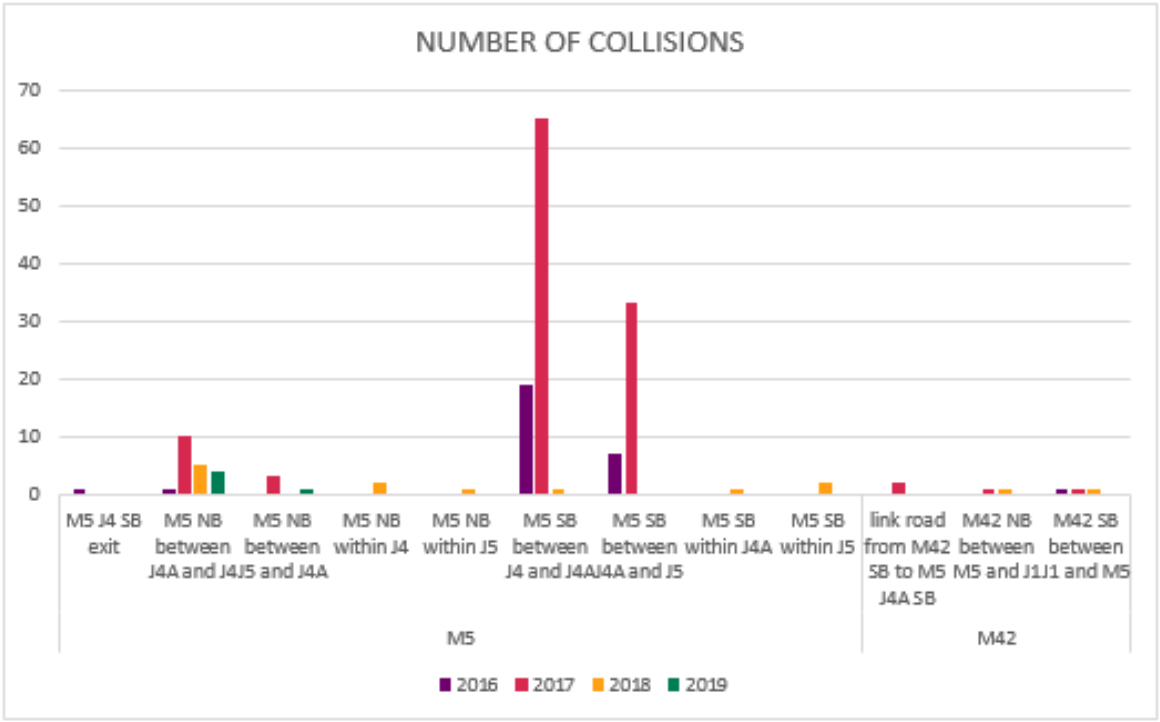


Table 3.19 – Collisions by year (M42/M5), (Source: NH)

	NUMBER OF COLLISIONS	2016	2017	2018	2019
M5	M5 J4 SB exit	1	-	-	-
M5	M5 NB between J4A and J4	1	10	5	4
M5	M5 NB between J5 and J4A	-	3	-	1
M5	M5 NB within J4	-	-	2	-
M5	M5 NB within J5	-	-	1	-
M5	M5 SB between J4 and J4A	19	65	1	-
M5	M5 SB between J4A and J5	7	33	-	-
M5	M5 SB within J4A	-	-	1	-
M5	M5 SB within J5	-	-	2	-
M42	link road from M42 SB to M5 J4A SB	-	2	-	-
M42	M42 NB between M5 and J1	-	1	1	-
M42	M42 SB between J1 and M5	1	1	1	-

The incidents generally occurred during overnight time. Only 3 of the incidents happened in daytime, and thus affecting key A38 traffic conditions and times, therefore less than 5% of the incidents which took place along M5 and M42 impacted peak times. It is also worth noting that collisions post 2017 significantly reduce on the southbound M5 between J4 and J5.

3.3.1.9.2 Planned and Unplanned Closures

Table 3.20 and Table 3.21 show periods of time when either the M5 or M42 motorway experienced a full carriageway closure.

Table 3.20 – M42 Full carriageway closures (March 2016 to February 2021)

PERIOD	REASON	DURATION	HISTORIC CLOSURE TYPE	LOCATION
Jul-16	Fault Investigation	1 day	Planned works	M5 Junction 1 to M42 NB Link
Dec-16	Bridge Inspections	2 days	Planned works	Junction 1 to M5 Junction 4a SB
Jan-17	Vehicle fire	6 hours	Incident	M42 South Link to M5 South
Jan-17	Electrical works	1 day	Planned works	M5 Junction 4 Entry Slip Road SB to M42 Link NB
Feb-17	Electrical works	1 day	Planned works	M5 Junction 4 Entry Slip Road SB to M42 Link NB
Mar-17	Electrical works	3 days	Planned works	M5 Junction 4 Entry Slip Road SB to M42 Link NB
Jun-17	Oldbury Major Scheme	6 weeks	Planned works	M5 Junction 4a to M42 Junction 1 NB

PERIOD	REASON	DURATION	HISTORIC CLOSURE TYPE	LOCATION
Jul-17	Oldbury Major Scheme	8 weeks	Planned works	M5 Junction 4a to M42 Junction 1 NB
Jul-17	White Lining & Gantry work	12 hours	Emergency	M5 Junction 4a to M42 Junction 1 NB
Aug-17	Oldbury Major Scheme	1 day	Planned works	M5 Junction 4a to M42 Junction 1 NB
Sep-17	Sign Installation	4 days	Planned works	M42 Southbound to M5 NB Link at Junction 4a
Nov-17	Oldbury Major Scheme	1 day	Planned Works	M5 Junction 4a to M42 Junction 1 NB

Table 3.21 – M5 Full carriageway Closures (March 2016 to February 2021)

PERIOD	REASON	DURATION	HISTORIC CLOSURE TYPE	LOCATION
Jan-16	Full closure of SB due to installation of smart motorway narrow lanes	10 weeks	Planned works	Affecting M5 Junction 4, 4a & 5 and M42 SB link to M5 SB
Mar-16	Full closure of SB due to installation of smart motorway narrow lanes	12 - 36 weeks	Planned works	Affecting M5 Junction 4, 4a & 5 and M42 SB link to M5 SB
Apr-16	Emergency resurfacing	1 day	Emergency	Junction 5 to junction 4a NB
Jun-16	Traffic signals	3 weeks	Planned works	M5 Junction 4a - 4 NB
Jul-16	Traffic signals	2 weeks	Planned works	M5 Junction 4a - 4 NB
Jul-16	Incident following RTC resurfacing required	1 day	Incident	Junction 5 to Junction 4A
Nov-16	Major Schemes	7 weeks	Planned works	Affecting M5 Junction 4a & 5
Dec-16	Full closure of SB due to installation of smart motorway narrow lanes	20 weeks	Planned works	Affecting M5 Junction 4, 4a & 5 and M42 SB link to M5 SB
Jan-17	Full closure of SB due to installation of	28 weeks	Planned works	Affecting M5 Junction 4, 4a & 5 and M42 SB link to M5 SB

PERIOD	REASON	DURATION	HISTORIC CLOSURE TYPE	LOCATION
	smart motorway narrow lanes			
Feb-17	Police led incident	9 hours	Incident	Affecting M5 Junction 4a & 5 including M42 Link South
Apr-17	Oldbury major refurbishment	32 weeks	Planned works	Junction 4a to Junction 5
May-17	Oldbury major refurbishment	28 weeks	Planned works	Junction 4a to Junction 5
Jun-17	Oldbury major refurbishment	60 weeks	Planned works	Junction 4a to Junction 5
Jul-17	Police led incident	1 day	Incident	Junction 4a to Junction 5 SB
Jul-17	White lining & Gantry work	6 weeks	Emergency works	NB junction 5 to 4a
Aug-17	Scheme works	4 weeks	Planned works	Junction 5 to 4a NB
Jan-18	Oldbury major refurbishment	1 day	Planned works	Junction 4,4a&5 affected

For the M42 corridor impacts, there were 12 incidents, of which 2 were unplanned. For the M5 there were 17 incidents of which 5 were unplanned. All of which would have impacted on the A38 in some form. This data was the most recently made available by NH and covers the period March 2016 to February 2021. It is assumed that the A38 would have likely been the alternative diversion route for these planned works. The data demonstrates that whilst the A38 as a diversion route supports the alternative route options for the M42 and M5 corridors that bypass Bromsgrove, it is also a critical link in supporting work on the wider Birmingham Motorway Box, as demonstrated by the impact of the Major Oldbury Viaduct refurbishment.

It is worth highlighting that NH, as part of the ongoing dialogue between NH and WCC, have stressed the importance of the A38 Bromsgrove corridor between M5 Junctions 4 and 5 as a diversion route to the M5 and M42 motorways, and its importance in providing a resilient network.

3.3.1.10 Wider Network Issues

The journey time data that was collected to inform the strategic VISUM model build includes a number of routes that traverse Bromsgrove (Chapter 4 Traffic Modelling and its appendices provide full details of modelling work undertaken). These routes include:

- Route 2 – A38/Birmingham Road junction to A38/B4084 junction via A448 Market Street and B4091 Rock Hill and Bromsgrove town centre.
- Route 3 – A448 corridor from Fockbury Road junction to Hewell Lane junction, via the A448 and Bromsgrove town centre.
- Route 4 – A38 / Woodrow Lane junction to B4091 Rock Hill/Fox Lane junction via B4091 Stourbridge Road, Perryfields Road and Whitford Road.
- Route 5 – B4091 Stourbridge Road from Perryfields Road junction to Bromsgrove station via New Road and A448 Stratford Road and College Road.

The statistical analysis of routes 2, 3, 4 and 5 are set out in Table 3.22 to Table 3.25.

Table 3.22 – Statistical analysis – Route 2 journey time data

	NB AM	NB IP	NB PM	SB AM	SB IP	SB PM
Mean JT	13 min 10 secs	13 min 44 secs	15 min 24 secs	12 min 49 secs	10 min 11 secs	12 min 07 secs
JT Standard Deviation	4 min 42 secs	1 min 44 secs	4 mins 00 secs	3 min 49 secs	0 min 55 secs	2 min 13 secs

Route 2 data shows a high degree of variability of journey time in the AM and PM peak periods during the survey, analysis of the data shows this variability is linked to travel through the centre area between the A448 junctions along Market Street and St John Street.

Table 3.23 – Statistical analysis – Route 3 journey time data

	NB AM	NB IP	NB PM	SB AM	SB IP	SB PM
Mean JT	17 min 02 secs	17 min 31 secs	16 min 30 secs	14 min 54 secs	14 min 33 secs	16 min 57 secs
JT Standard Deviation	6 min 11 secs	4 min 58 secs	5 min 09 secs	4 min 18 secs	2 min 36 secs	2 min 58 secs

The journey times along this route are highly variable in the northbound direction in all peak periods, with southbound variable but not as extreme as in the northbound direction, this is likely to be in the section along Market Street and St John Street.

Table 3.24 – Statistical analysis – Route 4

	NB AM	NB IP	NB PM	SB AM	SB IP	SB PM
Mean JT	13 min 58 secs	10 min 49 secs	14 min 43 secs	16 min 38 secs	10 min 58 secs	12 min 31 secs
JT Standard Deviation	1 min 51 secs	0 min 28 secs	2 min 00 secs	2 min 32 secs	0 min 31 secs	1 min 27 secs

Route 4 has a degree of variability in the journey time, but not as much as other routes, as the route does not pass through the town centre or through the A38 corridor.

Table 3.25 – Statistical analysis – Route 5 journey time data

	NB AM	NB IP	NB PM	SB AM	SB IP	SB PM
Mean JT	11 min 58 secs	9 min 58 secs	12 min 17 secs	14 min 32 secs	7 min 52 secs	13 min 07 secs
JT Standard Deviation	5 min 22 secs	2 min 55 secs	3 min 44 secs	5 min 05 secs	1 min 03 secs	3 min 23 secs

This route shows a large degree of journey time variability especially in the AM peak period.

Figure 3.41 to Figure 3.43 show the level of flows in 2017 operating on the main routes through Bromsgrove.

Figure 3.41 - AM peak Base Year flows (veh/hr)

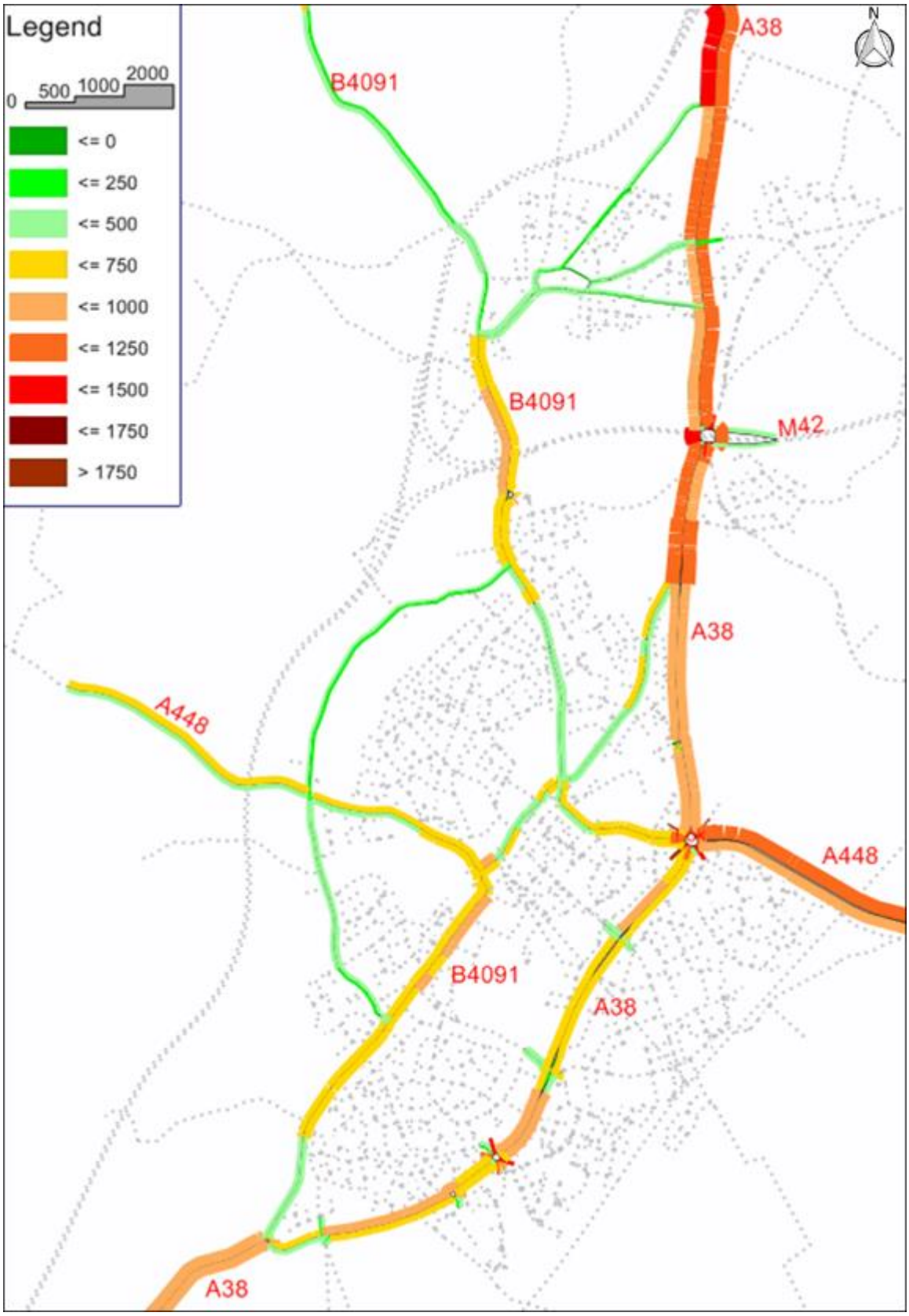


Figure 3.42 - Inter peak Base Year flows (veh/hr)

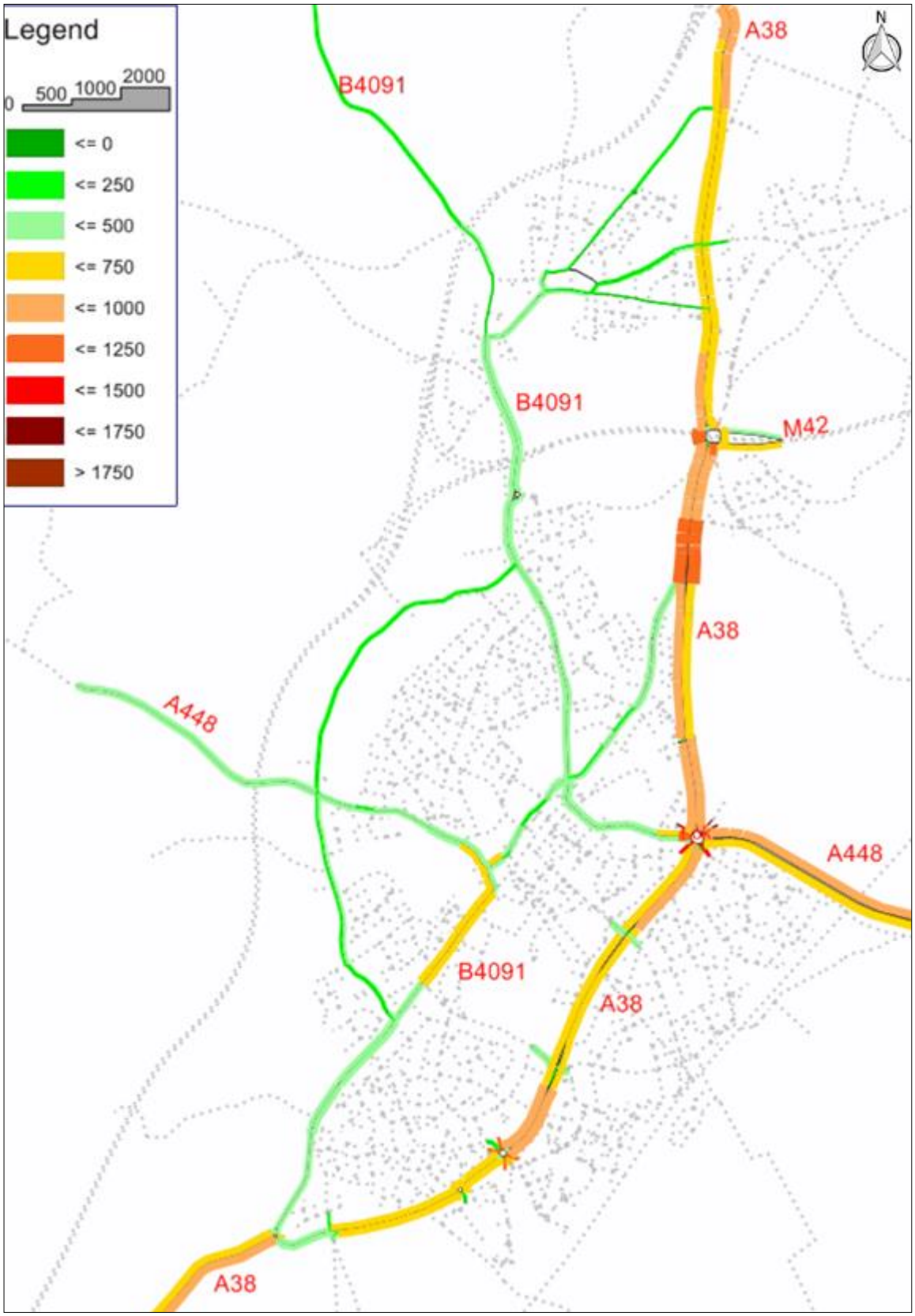
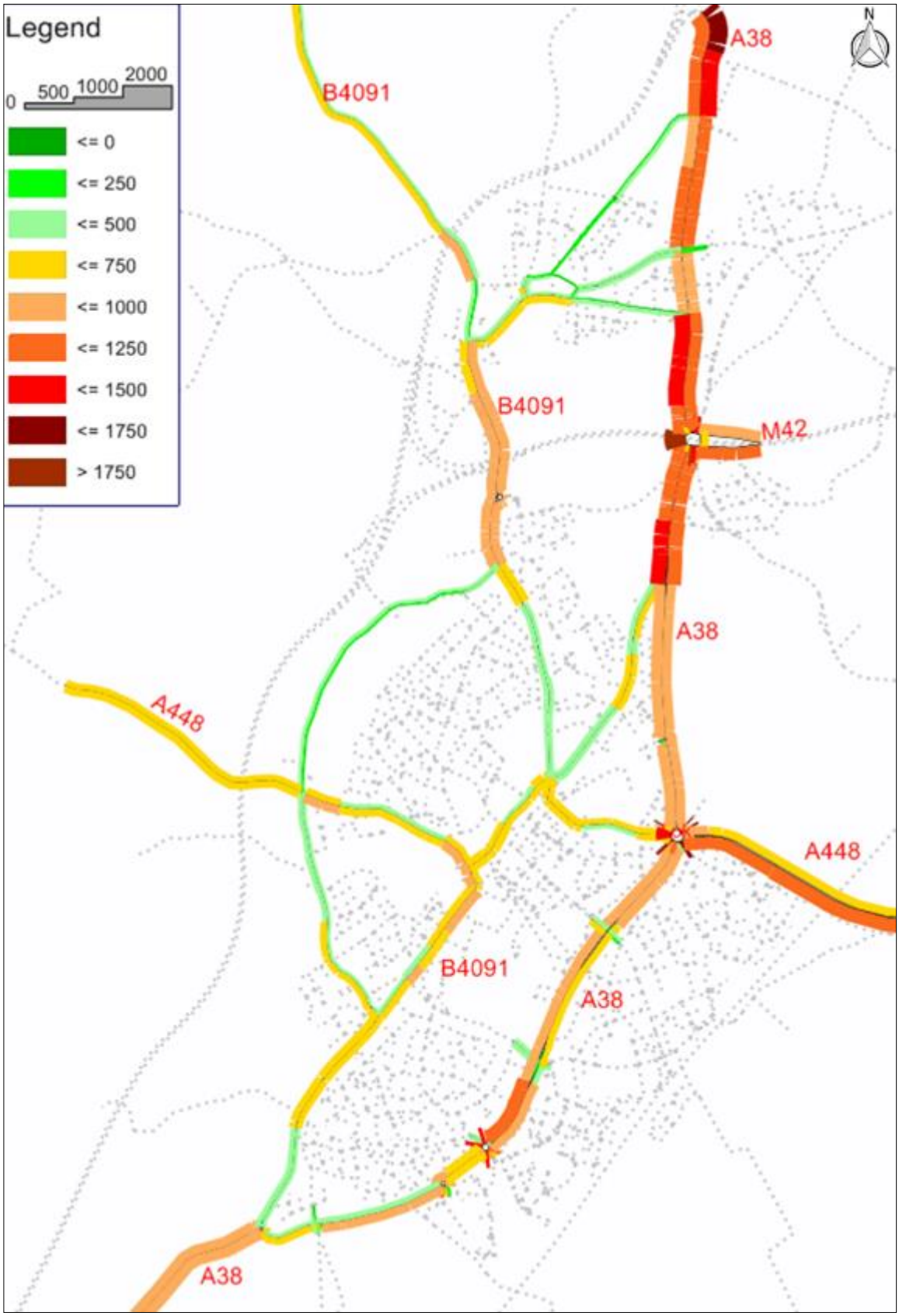


Figure 3.43 - PM peak Base Year flows (veh/hr)



3.3.1.11 Existing Pedestrian and Cyclist Conditions

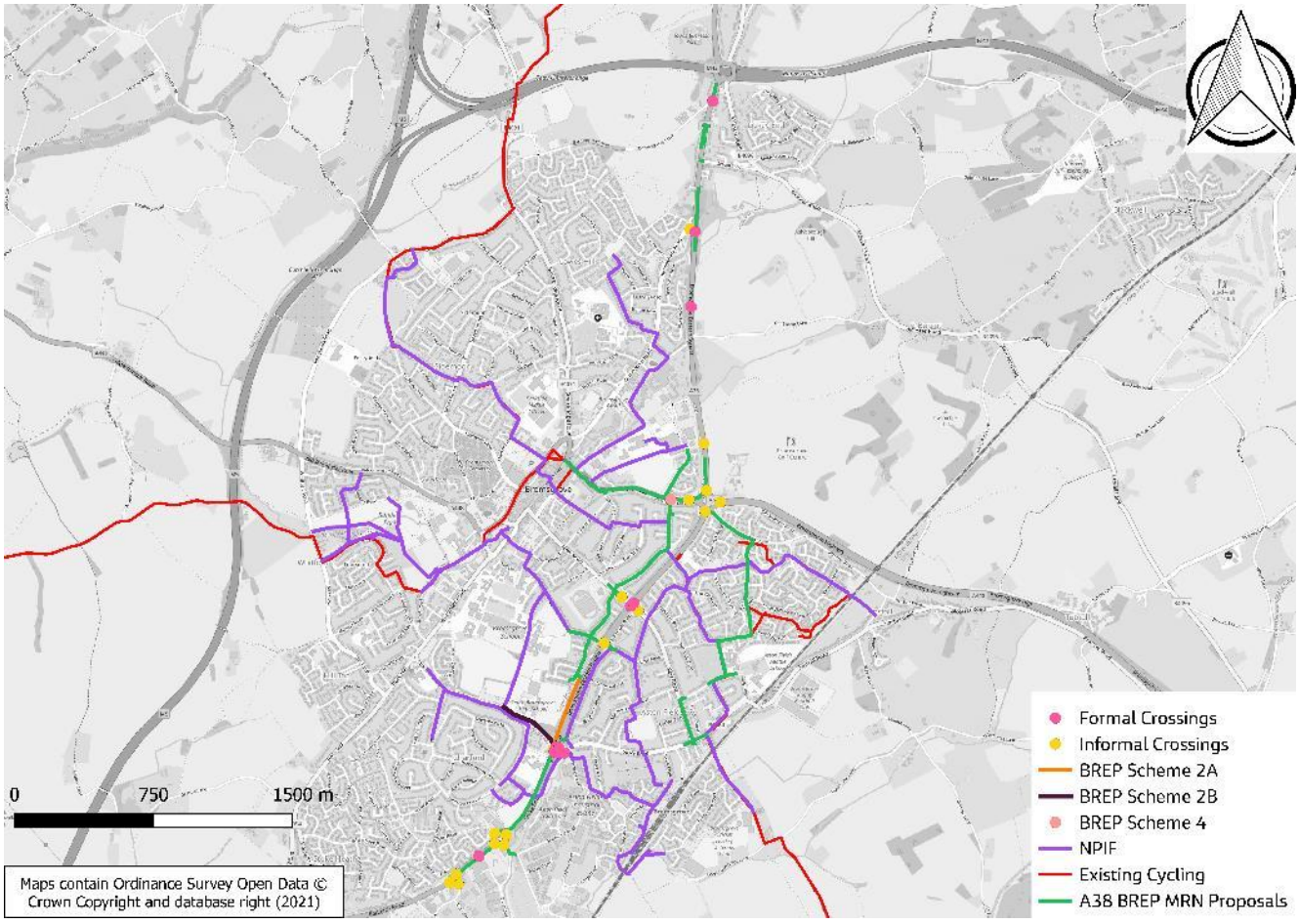
3.3.1.11.1 Pedestrian Infrastructure – Existing Network

Within the section of interest of the A38 corridor, there are two main issues around pedestrian provision. The first issue is that no footway exists alongside or adjacent to this section of the A38 (such as between the Birmingham Road and Burcot Lane section) is present without a significant detour. The second issue is that the majority of the routes present in this section of the A38 are between 1.0m and 1.5m with some short sections of 2.0m wide provision between the Buntsford Drive and Austin Road junctions. The narrower footway widths that are present, prevent movement for disabled users along the corridor for relatively short trips. In addition, site observations undertaken during the development of the SOC and OBC have identified school age children walking along the grass verge where no provision is present.

Within the corridor there are junctions which do not provide crossing facilities, such as at the Charford Road and New Road junctions for north to south movement, leading to a lack of safe and coherent provision.

Along the corridor there are some crossing points that facilitate access across the A38 (Figure 3.44), these are predominantly located within the 30 and 40mph speed limit areas. Within the areas subject to higher speed limits there are few crossing opportunities, and some uncontrolled crossing points. In the current network there are few crossings needed between the A38/A448 junction and Birmingham Road, as there are no trip origins or destinations pairs as there is limited development to the east of the A38 in this section.

Figure 3.44 – Crossing points – A38 corridor



Located to the south of New Road on the alignment of Old Station Road is an at grade crossing of the A38 (as shown in Figure 3.45), the crossing is located at the end of a two lanes merge to a single lane on exiting from New Road signals. The merge is currently lightly used.

Figure 3.45 - Existing crossing location south of New Road junction

Figure 3.46 is of the Charford Road signals during off peak hours. The crossing point is heavily used by primary and secondary school children, with large numbers of pedestrians cramming onto the central islands, waiting to cross. Site observations indicate that the group shown in the photograph headed across the A38 from the primary school located to the south of the junction, after walking along the A38 corridor, before walking south along a parallel A38 road (Sherwood Road). This is likely to be due to this being one of the few controlled crossing points on this section of the A38.

Figure 3.46 - Charford Road signals- Congested pedestrian waiting area

The other crossing location between the Rail Station and the town centre of the A38 is shown on Figure 3.47 in the vicinity of New Road. However, access to the station by walking and cycling is currently not well provided for. As such, the predominant mode of travel to the station is by private car, enabled by the large car park provided.

Cycle parking is provided at the station, but the walking and cycling routes to the station are not clearly defined and there is a perception of severance caused by the A38. Improved access is important if the station is to fulfil its full potential.

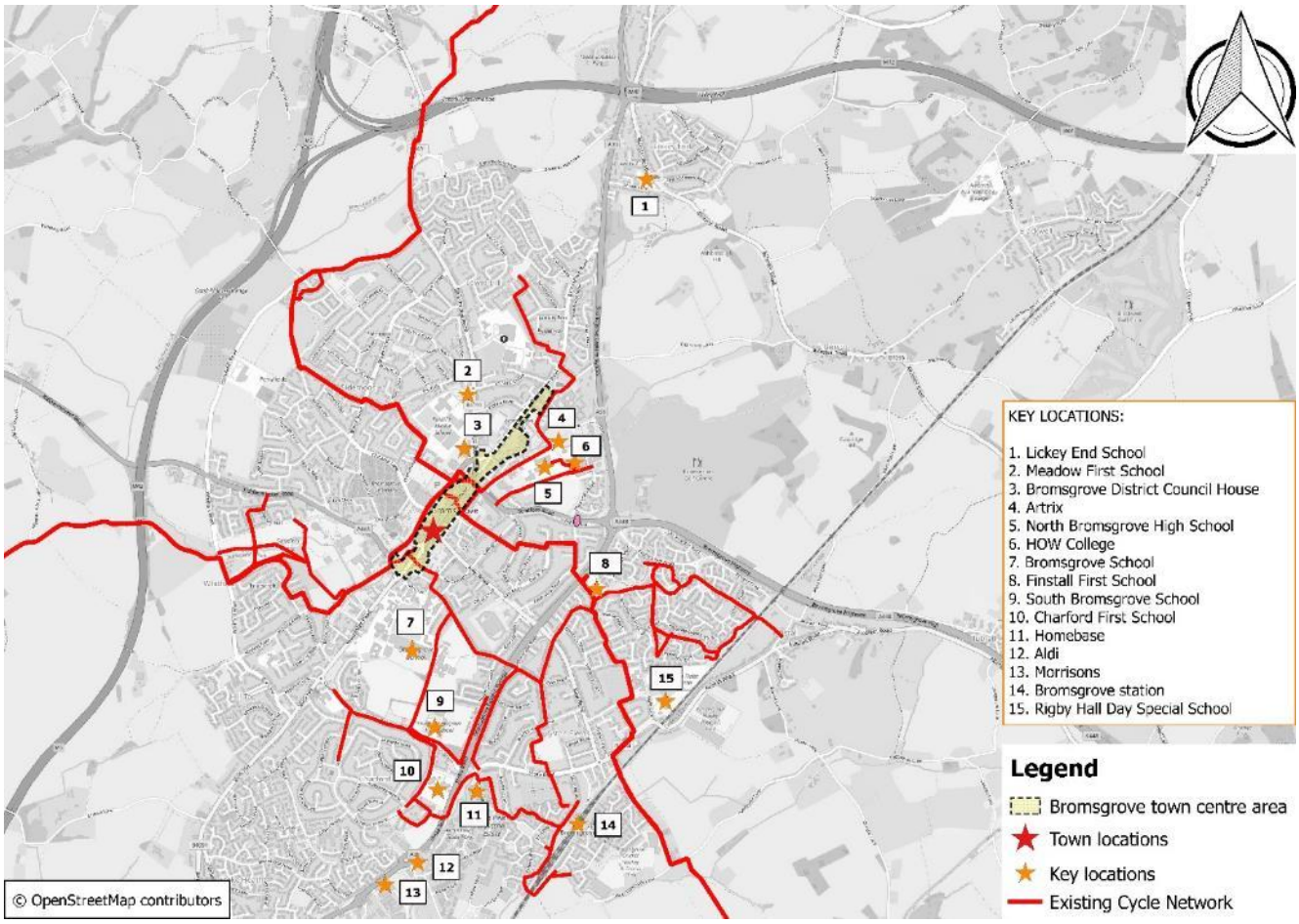
Figure 3.47 – New Road signals – A38 crossing provision on route between station and town centre

3.3.1.11.2 Cycle Infrastructure – Existing Network

The existing cycle network is shown on Figure 3.48. The majority of this network comprises of a mix of on road and off-road provision, and includes sections of National Cycle Network, NPIF funded measures and historic provision from development or locally funded schemes.

The remaining transport network is car dominated, including for local trips, and facilities for cycling are poor. Key movements within the area are between the Rail Station and town centre which are severed by the A38 traffic volumes and speeds. In addition, north-south movements along the A38 corridor are not provided for to provide alternative direct cycle mode provision between the residential areas to the north and south of Bromsgrove town to the Heart of Worcestershire College, or to connect the existing radial cycle routes, that the NPIF project has provided for.

Figure 3.48 - Existing Bromsgrove cycle routes



Two National Cycle Network Routes (Route 46 and Route 5) run through Bromsgrove of which one (Route 5) crosses the A38 at the south of the A448/A38 roundabout in the vicinity of Finstall First School.

3.3.1.11.3 Pedestrian and Cycle Usage

As can be seen in the 2011 census data in section 3.3.1.3, the mode share for cycling is low at 1.13%. In addition, the Census data shows a higher-than-average car ownership, that potentially leads to more car journeys and local congestion.

Surveys were undertaken for pedestrian and cyclist usage prior to the COVID-19 pandemic in the week 3rd - 9th February 2020 to provide information on the average weekday number of pedestrians and cyclists crossing key junctions along the A38 corridor in Bromsgrove between 07:00 and 19:00. This is shown in Table 3.26. The survey locations are demonstrated in Figure 3.49.

Table 3.26 – Average weekday pedestrian / Cycle count crossing data (07:00 – 19:00)

Location	Pedestrians	Cyclists
A38 / Buntsford Drive	198	0
A38 / Austin Road / Sherwood Road	435	20
A38 /Stoke Road / Charford Road	1402	26
A38 / Old Station Road / Stonehouse Road Footpath	152	7
A38 / New Road	466	14
A38 / Carnforth Road Bridge	234	25
A38 / A448	173	12
A38 / Birmingham Road	166	9
A38 / School Lane (Crossing A38)	5	0
A38 / School Lane (Crossing School Lane)	9	0
A38 / Braces Lane / Golden Cross Road	94	4
Total – All Surveyed Locations	3334	117

It should be noted that the week of the survey was during winter 2020, the weather conditions were very poor, with Storm Ciara sweeping across the UK on the weekend days of the survey. It is therefore considered that the volumes of active travel users would have been lower than the spring and summer months.

It would be reasonable and appropriate to apply a seasonality factor to these base figures to assess benefits of the scheme. There are permanent counters within Worcestershire at Sabrina Bridge and Diglis bridge, that allude to February having between 76% and 81% of annual average usage, indicating that a 20% uplift would be a reasonable uplift to take forward.

The data collected shows that during the survey week that on an average weekday there is a reasonable amount of pedestrian movement, primarily linked to the areas near to the schools and residential areas around Charford and New Roads. The number of cyclists within the surveyed times were low, potentially representative of a lack of cycle infrastructure, and hostile traffic conditions for cyclists, including high volumes and high speeds of traffic on the A38 corridor in particular. Furthermore, the survey was undertaken in cold weather conditions, which may further have deterred use.

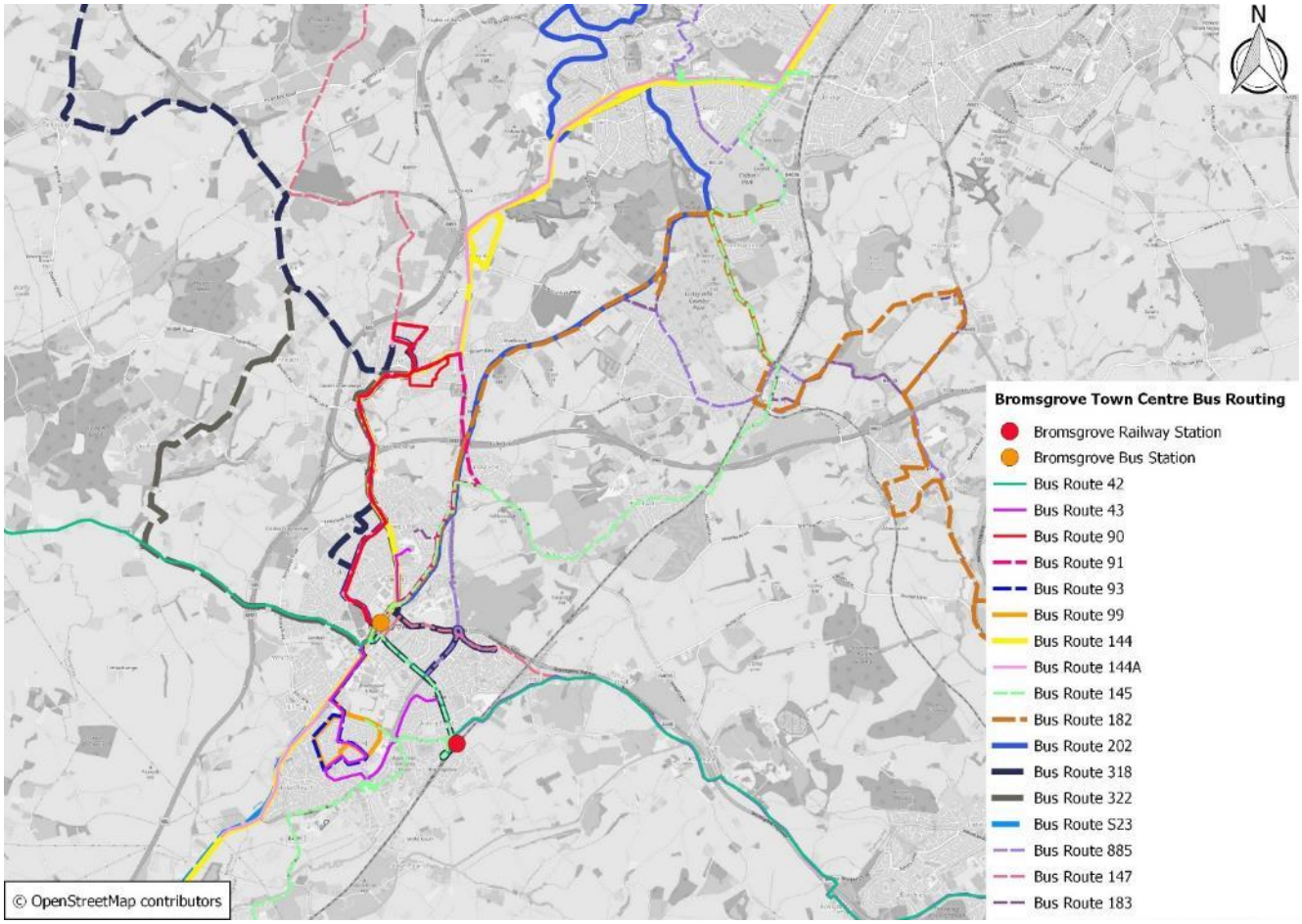
Figure 3.49 - Location of pedestrian and cycle surveys, February 2020

3.3.1.12 Public Transport

The network of services currently operating across Bromsgrove (as of April 2021) consist of a mixture of local town and inter-urban services. The inter-urban services link Bromsgrove with Birmingham and the neighbouring Worcestershire towns of Worcester, Droitwich Spa, Redditch and Kidderminster.

There are currently 17 bus routes which operate throughout Bromsgrove. The network is broadly operated by a handful of operators, including Diamond Bus (Rotala Group) and First Midland Red (FirstGroup), as well as a number of smaller independent operators. Figure 3.50 shows the routing of all bus routes in Bromsgrove. Bus routes present as dashed lines operate once an hour or less frequently. Table 3.27 and Table 3.28 then outline further detail on the operating network.

Figure 3.50 – Bus services within Bromsgrove (April 2021)



Most bus routes within Bromsgrove call at the bus station, which is located in the town centre on Crown Close. Some bus services also call at Bromsgrove Rail Station, to the south east of the town. Bus routes presented on Figure 3.50 as dashed lines have an operational frequency of less than one per hour. Overall, the number and frequency of bus services that interact with the A38 is limited, reflecting the overall low levels of service across Bromsgrove as a whole.

WCC have piloted a Worcestershire on Demand (WoD) initiative in Bromsgrove called 'Bromsgrove on Demand BoD'. This was operated with two vehicles, with capacity for 14 passengers and one wheelchair user and is funded by WCC. This provides a travel option from the town centre to the Rail Station and other key destinations, determined by the passengers.

WCC have evaluated the results of the pilot and have now launched this as a fully live service and WCC will be looking at how to integrate Demand Responsive Transport (DRT) service information into RTI displays and associated infrastructure recognising the importance of new and innovative Smart Hubs at critical interchange points which would allow connection with the strategic corridor routes. These interchange points would provide a location for DRT pickup and provide a booking system (through 10" interactive screens) that allow full accessibility to all residents.

DRT is also included in future planning of Worcestershire's Strategic Passenger Transport Network as it provides an appropriate alternative to other forms of transport. By improving flexibility based on passenger requirements, WCC believes this will increase the overall positive perception of public transport. Introduction of these services is aimed at providing a viable transport alternative to those who currently travel by car. One of the new and critical elements of a modern and innovative DRT service is the feedback that can be received via the DRT app. This provides a real-time view of the service; passengers can select a rating to describe their experience. The BoD service continues to receive excellent feedback via the app. Passengers have given a five-star rating (maximum) with 'route' and 'booking procedures' being notable contributions to its success.

3.3.1.12.1 Patronage Data

WCC have been able to obtain limited patronage data from operators on some of the subsidised routes, this data is set out below.

Table 3.27 – Patronage data (Route 42/43/145/145A)

Route	Month	Average Passengers Per Day	Peak Period Passengers (AM – 0700-1000 / PM – 1600-1900)
42	January 2021 (1st Jan to 31st Jan)	28.8	-
42	March 2021 (8th Mar to 10th Mar)	131	AM - 47.33 PM – 30.67
43	January 2021 (1st Jan to 31st Jan)	26.6	-
43	March 2021 (8th Mar to 10th Mar)	58	AM - 12.33 PM – 8.00
145	January 2021 (1st Jan to 31st Jan)	21.3	-
145	March 2021 (8th Mar to 10th Mar)	65.7	AM – 17.67 PM – 8.00
145A	January 2021 (1st Jan to 31st Jan)	12.6	-
145A	March 2021 (8th Mar to 10th Mar)	32.3	AM – 11.33 PM – 1.33

Table 3.28 – Patronage data (Route 147/318)

Month	Average Passengers Per Day (Route 147)	Average Passengers Per Day (Route 318)
April 2020	17	9
May 2020	23	15
June 2020	30	21
July 2020	35	41
August 2020	50	49
September 2020	60	99
October 2020	58	106
November 2020	37	98
December 2020	45	85
January 2021	23	24

It should be noted that in some of these months, the COVID-19 pandemic will have impacted on usage, due to various Government lockdowns, which may artificially lower the numbers. Notwithstanding the number of users is low and seems to support the Census data analysis that indicated a low public transport mode share in Bromsgrove (as presented in section 3.3.1.3). Overall, it is anticipated that bus services will benefit from measures to reduce queuing at junctions such as select vehicle detection that could be provided at key junctions.

Table 3.29 - Existing bus services and service characteristics (April 2021)

Bus Service	Route	Operator	Frequency (Minutes) Daytime (Mon-Fri)	Frequency (Minutes) Evening (Mon-Fri	Frequency (Minutes) Saturday	Frequency (Minutes) Sunday	First Journey	Last Journey	Journey Time (Entire Route (Minutes))
42	Redditch – Bromsgrove - Kidderminster	Diamond Bus	60	60	60	180	0650	1930	67
43	Redditch – Finstall – Bromsgrove	Diamond Bus	60	60	60	-	0630	2010	41
90	Bromsgrove – Sidemoor – Catshill (Byron Way)	MRD	30	-	-	-	0900	1215	19
91	Bromsgrove – Lickey End – Catshill	MRD	-	-	-	-	0820	1530	36
93	Bromsgrove – Charford (Circular)	CRG Wheeler (PLUS MRD 3 Services)	20	20	20	-	0732	1740	19
99	Bromsgrove – Charford (Circular)	CRG Wheeler	20	-	20	-	0850	1450	16
144	Birmingham – Bromsgrove – Worcester	First Group	60	60	60	60	0630	2145	85
144A	Catshill – Bromsgrove – Droitwich – Worcester	First Group	60	60	60	60	0758	1817	75
145	Rubery – Longbridge – Bromsgrove – Droitwich	Diamond Bus	60	45	45	-	0722	1816	75
147	Halesowen – Romsley – Bromsgrove	Kev's Cars & Coaches	120	-	120	-	0855	16555	47
182	Bromsgrove, Lickey, Alvechurch – Redditch	Diamond Bus	1 Journey	-	-	-	0931	-	45
183	Bromsgrove, Lickey, Alvechurch – Redditch	Diamond Bus	1 journey	-	-	-	1325	-	54
202	Halesowen – Bromsgrove	Diamond Bus	60	60	60	-	0655	1731	55

Bus Service	Route	Operator	Frequency (Minutes) Daytime (Mon-Fri)	Frequency (Minutes) Evening (Mon-Fri	Frequency (Minutes) Saturday	Frequency (Minutes) Sunday	First Journey	Last Journey	Journey Time (Entire Route (Minutes))
318	Bromsgrove – Belbroughton – Stourbridge	Kev's Cars & Coaches	120	120	120	-	0735	1745	59
322	Bromsgrove – Dodford – Fairfield – Bromsgrove	MRD	1 journey	-	-	-	0935	-	43
885	King Edward VI Five Ways – Fairfield	The Green Bus Service	1 journey	-	-	-	1550	-	58
S23	Bromsgrove – Droitwich – Worcester Sixth Form College	First Group	1 journey	-	-	-	0742	-	48

Table 3.30 - Existing April 2021 bus services which interact with the A38 corridor

Bus Service	Operator	Interaction with A38
144	First Group	Service uses A38/B4094 roundabout south of Bromsgrove. Service also uses A38 north of Golden Cross Lane junction
144A	First Group	Service uses A38/B4094 roundabout south of Bromsgrove
42	Diamond Bus	Service crosses A38 at New Road junction
43	Diamond Bus	Service uses A38 from Stoke Road to Austin Road
91	MRD	Service uses A38 from Braces Lane to M42 Junction 1 and from School Lane to Birmingham Road
145	Diamond Bus	Service uses A38 between Birmingham Road and School Lane, and crosses A38 at Charford Road junction
182	Diamond Bus	Service uses A38 between Birmingham Road and M42 Junction 1
202	Diamond Bus	Service uses A38 between Birmingham Road and M42 Junction 1
318	Kev's Cars & Coaches	Service uses A38 from New Road to A448 junction

3.3.1.12.2 Rail Network and Services

Bromsgrove town centre is connected to the rail network however the town's station is located approximately 1.2 miles to the east of the town centre, meaning that travelling to the town centre takes longer journey time. Parking charges at the station car park are slightly lower than charges at the town centre offering longer durations and seasonal tickets (daily, monthly and annual charges of £3, £40 and £360 respectively). The A38 corridor has limited crossing points to the station, resulting in the main routes being along Charford Road and New Road, with a further active modes route possible along Old Station Road.

Bromsgrove station connects to Worcester and Hereford to the south and west and Birmingham and its suburbs to the North. As such the regular services provided in the Birmingham direction has the potential to support longer distance commutes between Bromsgrove and Birmingham if improved access to the station can be provided, as there are limitations in connectivity to the town centre and residential areas to the west of the A38 corridor.

3.3.1.13 Road safety

This road safety section has utilised pre COVID-19 pandemic safety data, as more recent data might not show accurate levels of collisions on the network due to the numerous lockdowns on the highway network's traffic levels.

Over the five-year period between February 2015 and January 2020 there were 79 collisions along the A38 corridor, 64 of these were slight, 14 were serious and 1 was fatal. The collisions involved a total of 106 casualties with 54 of them being vehicle drivers including one fatality (i.e. driver of mobility scooter), 24 being vehicle passengers and 13 motorcycle riders, there were also six pedestrian and five cyclist casualties. Specifically, relevant to this scheme:

- 52 collisions took place at junctions within the corridor being considered as part of this bid. 46 of these were classed as slight, 5 of these were serious and one collision was fatal.
- Most collisions have occurred at the junction of the A38 with the A448, followed by Charford Road and the M42 Junction 1. The fatality occurred at the Charford Road/Stoke Road/A38 junction and at the New Road/A38 junction.

- The main causation factors of the collisions have been recorded as:
  - Poor turn / manoeuvre.
  - Failed to look properly.
  - Failed to judge other persons path or speed.
- Rear shunt collisions are common at the A38/A448 Roundabout.

Figure 3.51 shows the collisions that occurred on the A38 corridor within the five-year period (2015-2020) split by severity level.

Figure 3.51 - Five-year period collision data, February 2015 - January 2020

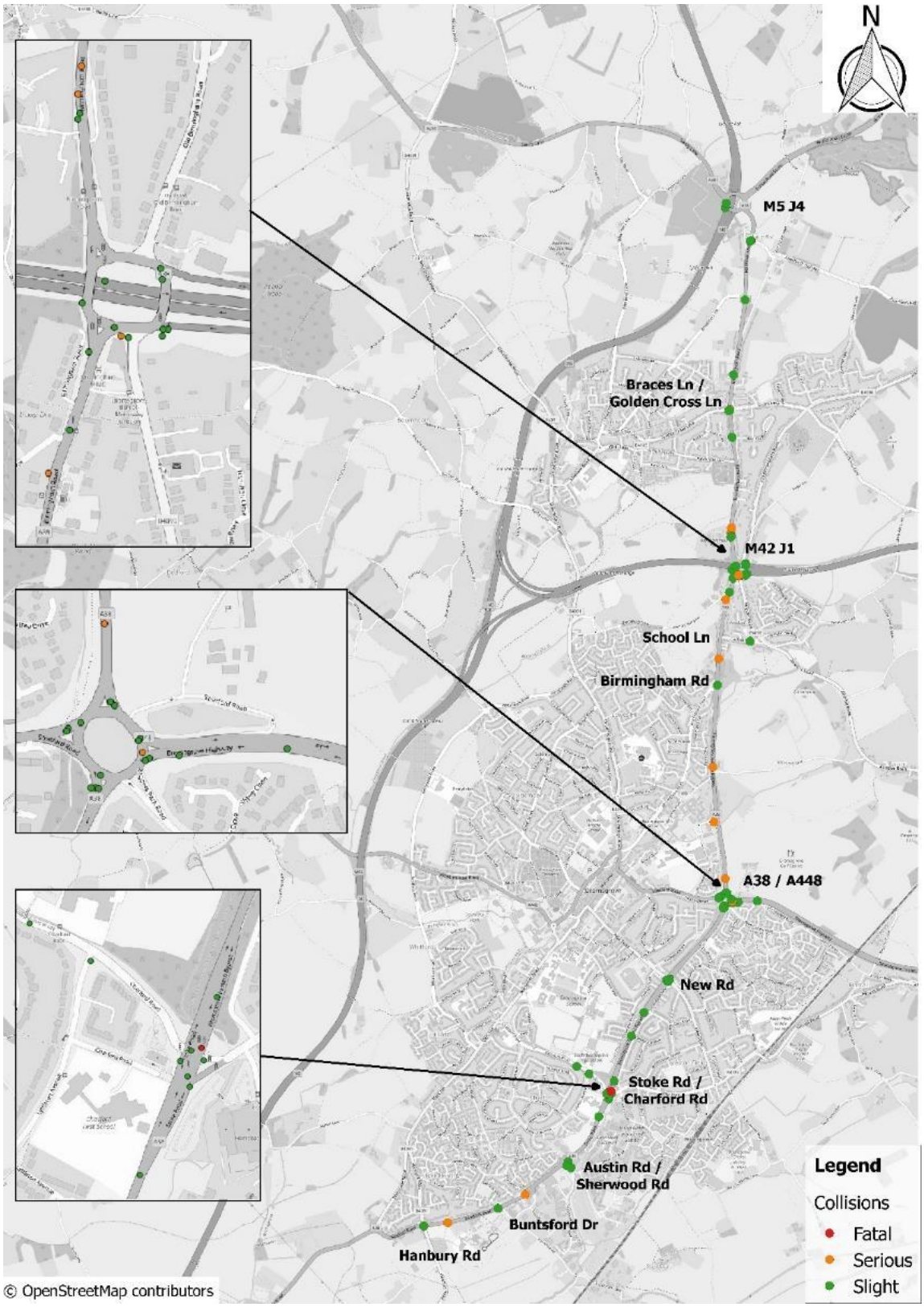


Table 3.31 shows the number of collisions and KSI ratio at the main junctions on the A38 corridor, while Table 3.32 sets out the causation for collisions at key locations on the A38 for the five-year period.

Table 3.31 – A38 collisions at the main junctions (Feb 2015 - Jan 2020), numbers, types and KSI Ratio by junction

Location	Slight	Serious	Fatal	Total	KSI
A38 / Braces Lane / Golden Cross Lane	3	1	0	4	0.250
M42 Junction 1	10	1	0	11	0.091
A38 / Birmingham Road	1	0	0	1	0.000
A38 / A448	15	2	0	17	0.118
A38 / New Road	4	0	0	4	0.000
A38 Stoke Road / Charford Road	6	0	1	7	0.143
A38 Austin Road / Sherwood Road	3	0	0	3	0.000
A38 / Buntsford Drive	0	1	0	1	1.000
A38 / Hanbury Road	3	1	0	4	0.250

Table 3.32 - Causation factors by location, February 2015 to January 2020 causation factor

Causation factor	A38 / Braces Lane / Golden Cross Lane	M42 J1	A38 / Birmingham Road	A38/ A448	A38 / New Road	A38 / Charford Road	A38 / Austin Road / Sherwood Road	A38 / Buntsford Drive	A38 / Hanbury Road	Total
Failed to look properly		1		4	3	2				10
Poor Turn / maneuver	3	1		1		1		1		7
Rain, Sleet, Snow or Fog							1			1
Failed to Signal / Misleading Signal		1								1
Deposit on road (e.g. oil, mud, chippings)										0
Failed to judge other persons path or speed	1	3	1	4		1	1		4	15
Overloaded or poorly loaded vehicle or trailer				1						1
Exceeding speed limit		1		1	1	1				4
Impaired by alcohol										0
Illegal turn or direction of travel										0
Junction overshoot				1						1
Emergency vehicle on call										0
Disobeyed automatic traffic signal										0
Illness or disability, mental or physical				1						1
Loss of Control		1				1				2
Not coded		3		4		1	1			9
Total	4	11	1	17	4	7	3	1	4	52

Of the 79 recorded collisions 6 involved pedestrians and 5 involved cyclists. The greatest number of collisions involving vulnerable users was at the A38 / Austin Road / Sherwood Road Roundabout. Table 3.33 shows the locations on the A38 corridor in which vulnerable user collisions have occurred.

Table 3.33 - Collisions involving vulnerable road users, February 2015 - January 2020

Junction	Pedestrians	Cyclists	Total
A38 / Austin Road / Sherwood Road	1	2	3
A38 / Charford Road		1	1
A38 / New Road	1		1
A38 / Braces Lane / Golden Cross Lane	1	1	2
Other (i.e. Birmingham Road / Topaz Way, Lyttleton Avenue / Charford Road / Slideslow Dr)	3	1	4
Total	**6**	**5**	**11**

The safety of the A38 corridor can influence mode choice as well as the resilience and reliability for all trips along the corridor. This impacts on both longer-distance trips as well as local trips within Bromsgrove. Improving the safety of pedestrians on the corridor is important to support increased walking and cycling.

3.3.1.14 Other Considerations on the A38 Corridor

3.3.1.14.1 Air Quality

Bromsgrove District Council has declared two AQMAs on the A38 corridor/within the scheme boundary for exceedances in nitrogen dioxide:

- Lickey End AQMA – this was declared on 26th July 2001. Residential properties along four roads emanating from M42 Junction 1 (including the A38) are affected. At declaration the NO2 level was 45.7µg/m3, but this has now reduced to 31.5µg/m^3.
- Redditch Road AQMA Stoke Heath– this was declared on 17th February 2010. This AQMA covers a stretch of the A38 from Austin Road to the B4094 Worcester Road and includes a number of residential properties. At declaration the NO2 level was 45.6µg/m3, but this has now reduced to 25.5µg/m^3.

A third AQMA lies in close proximity to the corridor/scheme boundary at Worcester Road. A fourth AQMA is designated in Bromsgrove district, but this lies outside of the scheme boundary at Worcester Road. These are shown on the environmental constraints plan included as Appendix S.2.

There are a number of sensitive receptors within close proximity to the cumulative scheme, including residential properties and a number of educational establishments including nurseries, pre-schools, prep-schools, primary schools and senior schools. There are also a number of Local Wildlife Sites (LWS) located within 2km of the cumulative scheme, the closest being Spadesbourne Brook LWS which is directly within the boundary of Schemes C and 2A.

Assessment of air quality has been undertaken including modelling and is reported in Chapter 8 of the Environmental Report (Appendix S.3). An outline Construction Environment

Management Plan (CEMP) has been produced (Appendix 2 of the Environmental Report) to guide environmental management and mitigation, including air quality and dust, during construction and is to be updated by the appointed contractors as appropriate. Construction works will require ongoing discussion between the Contractor and Worcestershire Regulatory Services regarding any specific controls to be applied. In the modelled 2017 Base scenario, exceedances were identified at the Lickey End AQMA, indicating an air quality problem at this point, however the opening year DM and DS scenario forecasts indicate that due to improvements in the vehicle fleet, the magnitude of the exceedance reduces.

3.3.1.14.2 Noise

A number of Noise Important Areas (NIAs) are present along the A38. These are shown on the environmental constraints plan included as Appendix S.2. These are identified as areas requiring action to reduce noise levels. In addition, there are noise sensitive receptors along the corridor, and these are already exposed to high levels of traffic noise.

Noise Important Areas (NIAs) are:

- ID 7641, located along the A38, Birmingham Road.
- ID 8211, located along the A38, Birmingham Road.
- ID 7566, located along the A448, Bromsgrove Highway.
- ID 7567, located along the A448, Bromsgrove Highway.
- ID 7639, located along the A38, Birmingham Road.
- ID 7640, located along the A38, Birmingham Road.
- ID 7649, located along the A38, Redditch Road.
- ID 7646, located along the A38, Birmingham Road.
- ID 7647, located along the A38, Birmingham Road.
- ID 7648, located along the A38, Birmingham Road.

There are a number of sensitive receptors within close proximity to the cumulative scheme, including residential properties and a number of educational establishments including nursery, pre-schools, prep-schools, primary schools and senior schools.

Assessment of noise has been undertaken, including modelling, and is reported in Chapter 9 of the Environmental Report (Appendix S.3). An outline CEMP has been produced (Appendix 2 of the Environmental Report) to guide environmental management and mitigation, including noise and vibration, during construction and is to be updated by the appointed contractors as appropriate. Construction works will require ongoing discussion between the Contractor and Worcestershire Regulatory Services regarding any specific consents to be applied (e.g. under s61 of the Control of Pollution Act 1974).

3.3.1.14.3 Other Environmental Issues

In addition to noise and air quality, other environmental issues which are important to consider are summarised in the following paragraphs.

3.3.1.14.3.1 Biodiversity and Ecology

There are no Sites of Special Scientific Interest (SSSI) located within the cumulative scheme. Upton Warren Pools SSSI is located approximately 1km to the south-west of Scheme A at the closest point to the cumulative scheme. Burcot Lane Cutting SSSI

(geological SSSI) is also located approximately 100m east of Scheme 1. No further SSSI's are located within 2km of the cumulative scheme.

There are no Ramsar sites, Special Protection Areas (SPA) or Special Areas of Conservation (SAC) within 2km of the cumulative scheme, and no SACs with bats as a qualifying feature located within 30km of the cumulative scheme. A number of Local Wildlife Sites (LWS) are located within 2km of the cumulative scheme, the closest being Spadesbourne Brook LWS which is within the boundary of Scheme C.

Species surveys have been undertaken at the appropriate survey times. These are summarised in Chapter 4 of the Environmental Report and appended in full (Appendix S.3). Protected species include badgers and bats, also reptiles are likely to be present in some locations. Breeding birds are likely to be widespread throughout the cumulative scheme.

Further assessment will be required by the Contractor as the construction programme progresses, as protected species may move over time. As such, pre-construction surveys will be required before each scheme is built to inform mitigation and any associated protected species licences from Natural England. An outline CEMP has been produced (Appendix 2 of the Environmental Report Appendix S.3), to guide environmental management and mitigation during construction, and is to be updated by the appointed contractors as appropriate.

3.3.1.14.3.2 Water and Drainage

There are a number of water bodies in the vicinity of the corridor including the Spadesbourne Brook and the Sugar Brook, which are both classified as a Main River by the Environment Agency. The cumulative scheme also lies within areas designated by the Environment Agency as fluvial Flood Zones 2 and 3. These are shown on the environmental constraints plan included as Appendix S.2.

Site observations, historic records and councillor inputs have identified a number of potential issues that can be addressed as part of the A38 improvements, as part of upgrading the network. Known issues include:

- Flooding occurs on a regular basis in the vicinity of the Austin Road / Sherwood Road roundabout (often referred to as Morrison's roundabout). As this issue is largely related to sewer flooding Severn Trent Water are investigating potential solutions.
- The Charford Road junction with the A38 is also known to flood from the Spadesbourne Brook. The Environment Agency are looking at flood alleviation schemes further up the catchment.
- In the vicinity of the property known as The Tyrst, to the north of the Birmingham Road junction, local councillors have highlighted an issue when there is heavy rainfall, that properties are subject to surface water ingress. Site observations indicate a lack of gullies in the vicinity of the junction meaning that it is likely that water is overtopping the kerb.

Assessment has been carried out to understand the impacts of the cumulative scheme on the water environment and is reported in Chapter 7 of the Environmental Report (Appendix S.3). Drainage Strategies which include flood risk assessment have also been produced for each scheme.

An outline CEMP has been produced (Appendix 2 of the Environmental Report - Appendix S.3) to guide pollution control, environmental management and mitigation during construction and is to be updated by the appointed contractors as appropriate.

Environmental consents will be required from the Environment Agency where the works have an impact on a Main River. The Contractor will be required to apply for any relevant consents from the Environment Agency and / or Lead Local Flood Authority (North Worcestershire Water Management, on behalf of WCC) in relation to outfalls, discharges and works within Flood Zones.

3.3.1.14.3.3 Landscape and Visual

Sections along the A38 have well established areas of planting which provide screening to receptors including residential properties and schools. The periphery of Bromsgrove is surrounded by open fields which can be accessed by a variety of Public Rights of Way (PRoW) that are present throughout the cumulative scheme extents.

The cumulative scheme falls within two National Character Areas (NCA). This includes:

- The Arden NCA (no.97) for the northern extent of the cumulative scheme; and
- The Severn Avon Vales NCA (no.106) for the southern extent of the cumulative scheme.

A number of individual trees and groups of trees along the scheme are subject to Tree Preservation Orders (TPO's) and, therefore, require permission from the Local Planning Authority (Bromsgrove District Council) prior to any cutting down, topping, lopping, uprooting, or damage to trees and roots, together with landowner consent. More information on these features can be found within the Tree Survey Report and Tree Protection Plans appended to The CEMP and in the Landscape and Ecological Management Plans (LEMP) appended to the Environmental Report (Appendix S.3).

An appraisal to determine the landscape and visual impacts of the scheme on the landscape and townscape and the mitigation required to address the impacts is set out in Chapter 5 of the Environmental Report as well as in the CEMP and LEMP (Appendix S.3). Extensive landscape planting has been proposed as part of the final design (see the LEMP).

3.3.1.14.3.4 Cultural Heritage

A number of Listed Buildings in the vicinity of the corridor, predominantly clustered within the town centre. There are no Scheduled Ancient Monuments within 1km of the scheme. As the proposed works lie within the existing highway boundary, any archaeology would have likely already been disturbed by the original road construction, such that archaeology is not considered likely to be a major constraint.

A desk-based Heritage assessment has been undertaken and is reported in Chapter 6 of the Environmental Report (Appendix S.3).

3.3.1.15 Summary of Existing Problems

This chapter has set out the existing problems on the A38 Corridor these are:

- The A38 corridor has different characteristics and design standards along the corridor. The A38 provides for local trips within Bromsgrove, longer distance strategic trips from/to Bromsgrove and trips that pass through Bromsgrove with an origin and destination.
- The A38 supports Bromsgrove travel to and from the wider West Midlands area.
- The Bromsgrove area has a higher proportion of multiple cars owning households that the West Midlands and England areas.

- A higher proportion of the Bromsgrove working population travels via car rather than sustainable travel modes compared to national and regional patterns.
- The A38 corridor suffers from high traffic volumes and associated peak period congestion due to junction constraints.
- Walking provision along the A38 within Bromsgrove is poor, with limited adjacent footways to the corridor or suitable connected alternatives in the north south direction. Where routes are present these are of a poor quality with widths in the region of 1.0 to 1.5m, restricting wheelchair accessibility.
- Crossing provision on the A38 corridor, both across the A38 and minor roads, is poor with limited provision to support movement between key destinations, such as the town centre and Bromsgrove Rail Station.
- Cycle provision in the corridor is a mix of predominantly on and off-road routes.
- Transport network along and across the A38 is car dominated, and presents poor mode choice options, due to the car dominance.
- Journey time reliability along the A38 corridor is poor.
- A number of AQMA's are present on the A38 corridor.
- There are a number of Noise Important Areas present along the A38.

3.3.2 Future Situation

This section of the Strategic Dimension sets out future problems and challenges, developments and forecasts (in 2025 and 2040 scenarios) as defined by the outputs from the strategic VISUM modelling (which is detailed in chapter 4 of the FBC).

3.3.2.1 Future Housing and Employment Growth

Pressure on the A38 corridor will increase in the future as sites allocated in both the Bromsgrove District and Redditch Borough Local Plans come forward for development. The planned growth in housing will increase the demand for travel. The future year transport modelling work captures this increased demand.

In terms of planned development, the following is provided for context (information on the specific development assumptions made in the traffic modelling is detailed separately in the Traffic Modelling chapter 4).

- The Bromsgrove District Plan (adopted in 2017) includes major residential development sites around the edge of Bromsgrove, with Perryfields Road and Whitford Road being particularly relevant to the A38. Smaller residential allocations are also found in surrounding areas. In total the Local Plan identifies a need for 7,000 dwellings and 28 Hectares of employment land in the period 2011-2030. However, the adopted Local Plan only allocated land for 4,700 dwellings to 2023, noting that allocating land for the remaining 2,300 homes would be subject to a Green Belt review as part of a Local Plan Review. Subject to the ongoing Local Plan review, the scheme may further support delivery of additional homes and employment land.
- The Local Plan Review will also identify development allocations for growth beyond 2030 and in its Issues and Options consultation put forward various scenarios. The consultation documents published in September 2019 proposed that the new Plan will have a likely start date of 2023 and an end date of 2040. Over this period the Plan will be required to provide for at least 6,443 dwellings and up to 90 Hectares of employment land.

- Within close proximity of the A38 corridor area there are significant cross-boundary allocations within the adopted Local Plan for Redditch. This includes an additional 3,400 dwellings (and 5.5 hectares of employment land) on the border with Redditch but located within Bromsgrove District, to meet Redditch's housing need, as identified in their own Local Plan. The allocation at Foxlydiate is particularly relevant to the A38.
- In addition, there are further allocations within the Redditch Local Plan (and sited within Redditch itself). Around 3,000 dwellings and 27.5 hectares of employment land are to be accommodated within Redditch Borough.
- The Infrastructure Delivery Plans (2014) for both Bromsgrove District and Redditch Borough recognise that junction improvements are required along the length of the A38 corridor in order to help support the development outlined in the adopted Local Plans.
- The adopted Bromsgrove Local Plan recognises that a key challenge is to ensure that the district is accessible whilst also encouraging sustainable travel and encouraging walking and cycling. A key part of the vision for the future is that "walking and cycling links will have been improved to better connect residents with local and regional destinations, providing health benefits and decreasing carbon emissions" and that "walking and cycling will be an easy first choice for shorter journeys."

Table 3.34 shows key development sites in the vicinity of the A38 identified within the adopted 2017 plans and it highlights the status of each site. The quantum of proposed development within the adopted Local Plans requires enhancements to transport infrastructure, including the A38, to support the delivery of housing and employment and this is recognised in the Transport Section of the Infrastructure Delivery Plans for each District and is reflected in the S106 contributions negotiated for each site.

Whilst no individual development site currently has planning conditions that restrict development in advance of delivery of the A38 BREP Phase 3 schemes, there are planning linkages between this scheme and the delivery of allocations identified in adopted Local Plans and this is reflected in the requirement for S106 contributions to the scheme. Section 106 contributions have been sought because it is recognised that traffic from these sites impact the A38 corridor. In each case calculations have been undertaken by WCC to determine the impact of each development on key A38 junctions and contributions sought on this basis. This principle has been accepted by developers in negotiations, and also accepted by the Planning Inspector on the Whitford Road site.

Where WCC and Bromsgrove District Council are currently assessing planning applications for major housing development sites within Bromsgrove and there is the potential for Conditions to be attached to any permission limiting development prior to the implementation of elements of the scheme. The A38 in its current form as a key constraint to additional future development allocations through the Local Plan review process.

In summary, the A38 BREP Phase 3 scheme supports the delivery of 5310 homes and 13.45 Hectares of employment land based on the current plan. Subject to the ongoing Local Plan Review process, the scheme may further support delivery of additional homes and employment land. These figures are based on the developments contributing S106 payments to the scheme. It should be noted that the total number of homes presented in Table 3.34 is 5950 (further details are presented in the Economic Dimension Appendix E.1: Economic Impacts Report). The difference between the two measures (640 homes) is attributed to the exclusion of the following two items:

- Webheath Phase 1 and 2: 400 homes; these schemes do not provide S106 contributions.

- Foxlydiate: The approved planning application with associated S106 agreement is for 2,560 homes rather than 2,800 homes, excluding the 63, 50, and 127 units that are not subject to the same S106 agreement or haven't formed part of a planning application yet.

*Table 3.34 - Status of main development sites in vicinity of A38**

Site	Authority	Local Plan allocation	Application status	S106 contribution	Condition preventing build out of site in advance of A38 BREP MRN improvements
Perryfields Road	Bromsgrove	1,300 homes 5 hectares employment	**CONSENTED** Outline application submitted April 2016 and approved at appeal in Summer 2021 with Section 106 signed. 1,300 homes, 200 bed care facility, 5 Hectares of B1 employment space, mixed use local centre and associated community infrastructure	Yes	No, but clause in S106 agreement caps occupation at 400 units until a contract is let for A38 BREP Phase 3 improvements to A448 and New Road junctions. If a contract has not yet been let then occupation is limited to 650 dwellings until the standalone highway works improvements to A448 and New Road have been delivered.
Whitford Road	Bromsgrove	490 homes 400sqm A1 retail	**CONSENTED** Approved at appeal in early 2012 and Section 106 signed. 490 dwellings, Class A1 retail local shop and associated infrastructure	Yes	No
Foxlydiate	Bromsgrove/ Redditch	2,800 homes	**CONSENTED SUBJECT TO SIGNING OF S106** Hybrid application was approved by both Bromsgrove and Redditch Planning Committees during 2020, but consent remains subject to signing of S106. 2,560 dwellings, up to 900sqm local centre, up to 900sqm health and community facilities, a 3-form entry first school and	Yes	No

Site	Authority	Local Plan allocation	Application status	S106 contribution	Condition preventing build out of site in advance of A38 BREP MRN improvements
			associated community infrastructure. A detailed application has been made for the primary access, drainage, landscaping and utilities works. Separate application also approved for a further 63 units. Additional application for 50 units (12 apartments / 38 dwellings) submitted and currently being determined by WCC. 127 units from the original Local Plan allocation are yet to be subject to an application		
Brockhill East, phase 1	Redditch/Bromsgrove (cross border allocation)	Cross border allocation of 600 at Brockhill. Redditch allocation of 1,025 at Brockhill East. Total 1,625	171 homes and 4,738 m2 of B1 consented and now built/occupied	No	No
Brockhill East, phase 2	Redditch/Bromsgrove (cross border allocation)	Same as above	296 homes and 3,100 m2 of B1 consented and under construction	No	No

Site	Authority	Local Plan allocation	Application status	S106 contribution	Condition preventing build out of site in advance of A38 BREP MRN improvements
Brockhill East, phase 3	Redditch/Bromsgrove (cross border allocation)	Same as above	**CONSENTED SUBJECT TO SIGNING OF S106** Hybrid application approved in early 2021, subject to signing of S106. 960 homes All land within Local Plan allocation now subject to an application, so no further units left to come forward.	Yes	No
Webheath - Phase 1	Redditch	400 – 600 homes	Consent granted for 200 homes – now built out	No	No
Webheath – phase 2	Redditch		Current outline application for 165 homes currently being determined.	To be determined.	To be determined.
Former Polymer Latex	Bromsgrove	Allocated for B1/B2/B8	Consent granted for 148 dwellings. Construction underway.	No	No

**Only new main development sites in the vicinity of the A38 are included in this table.*

3.3.2.2 Congestion and Traffic Flows– 2025 & 2040 Forecast Years

Based on the VISUM model results, future congestion levels are expected to increase mainly in 2040 scenario AM period in the northbound and southbound direction. This section sets out the 2025 and 2040 Do Minimum forecast scenario implications of the without scheme scenario. The modelled traffic volumes along the corridor are shown in Figure 3.52 to Figure 3.55 for the 2025 and 2040 Do Minimum (without scheme) scenario.

Figure 3.52 - Modelled 2025 traffic volumes – Do Minimum – AM peak

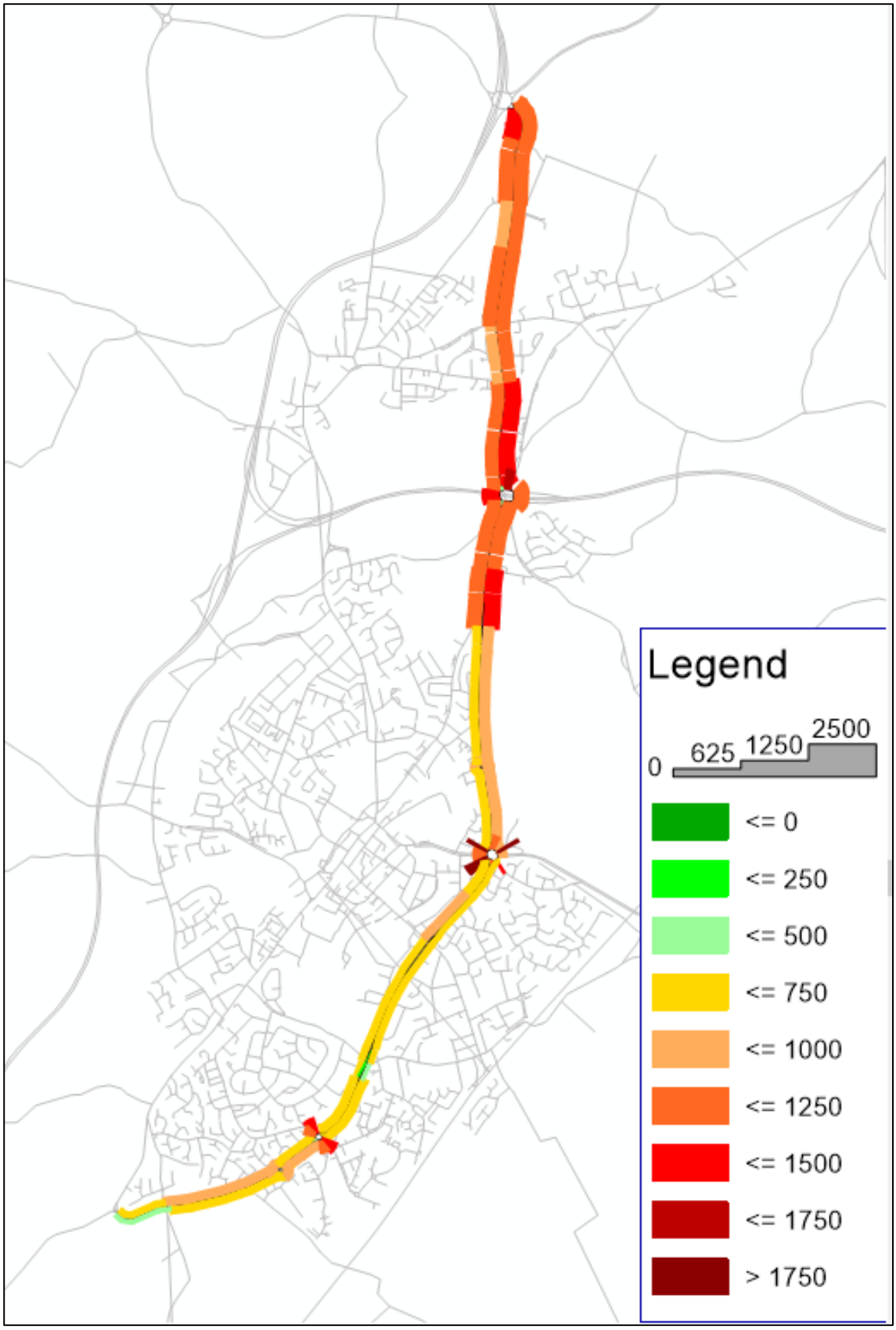


Figure 3.53 - Modelled 2025 traffic volumes – Do Minimum – PM peak

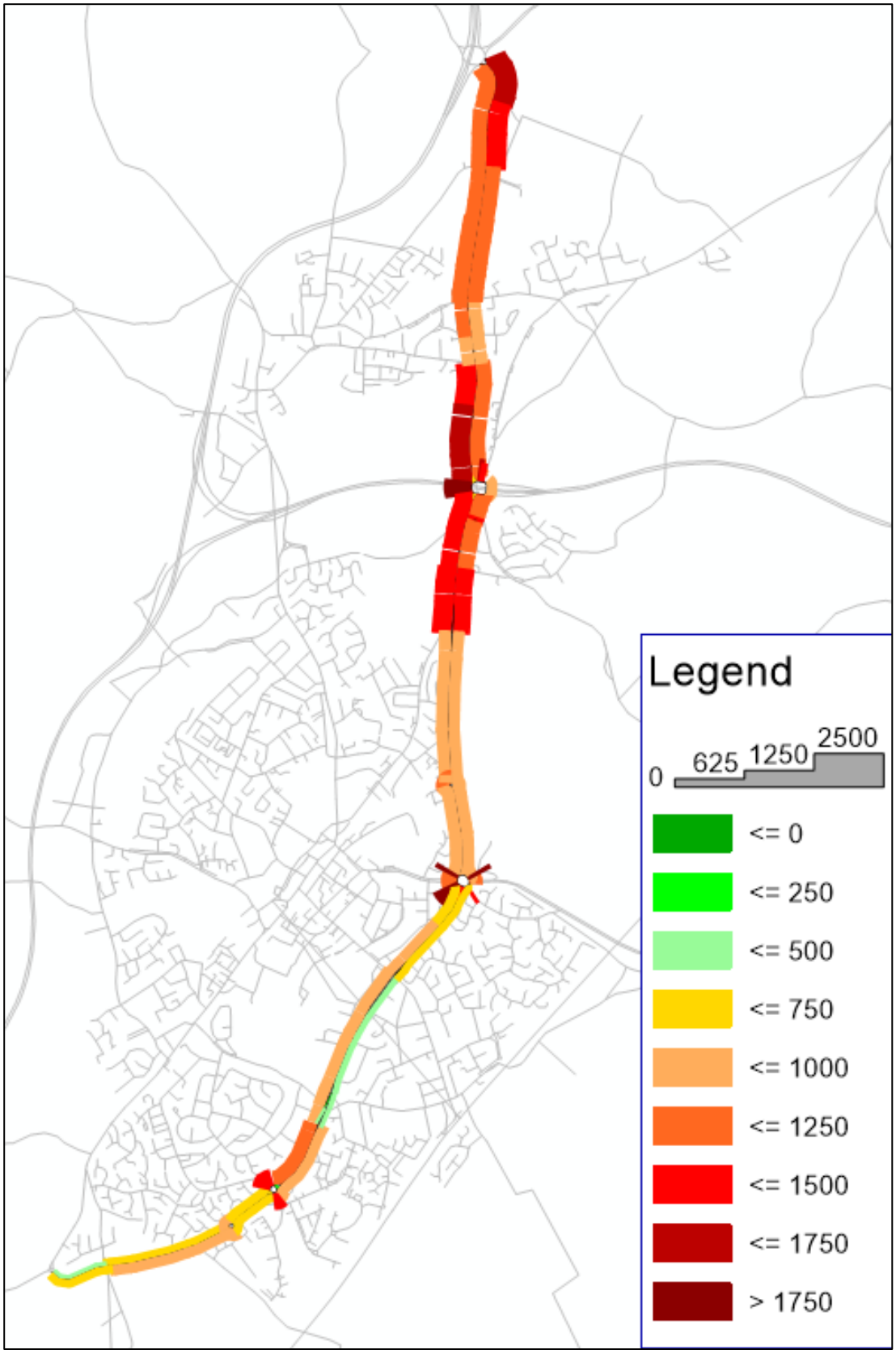


Figure 3.54 - Modelled 2040 traffic volumes – Do Minimum – AM peak

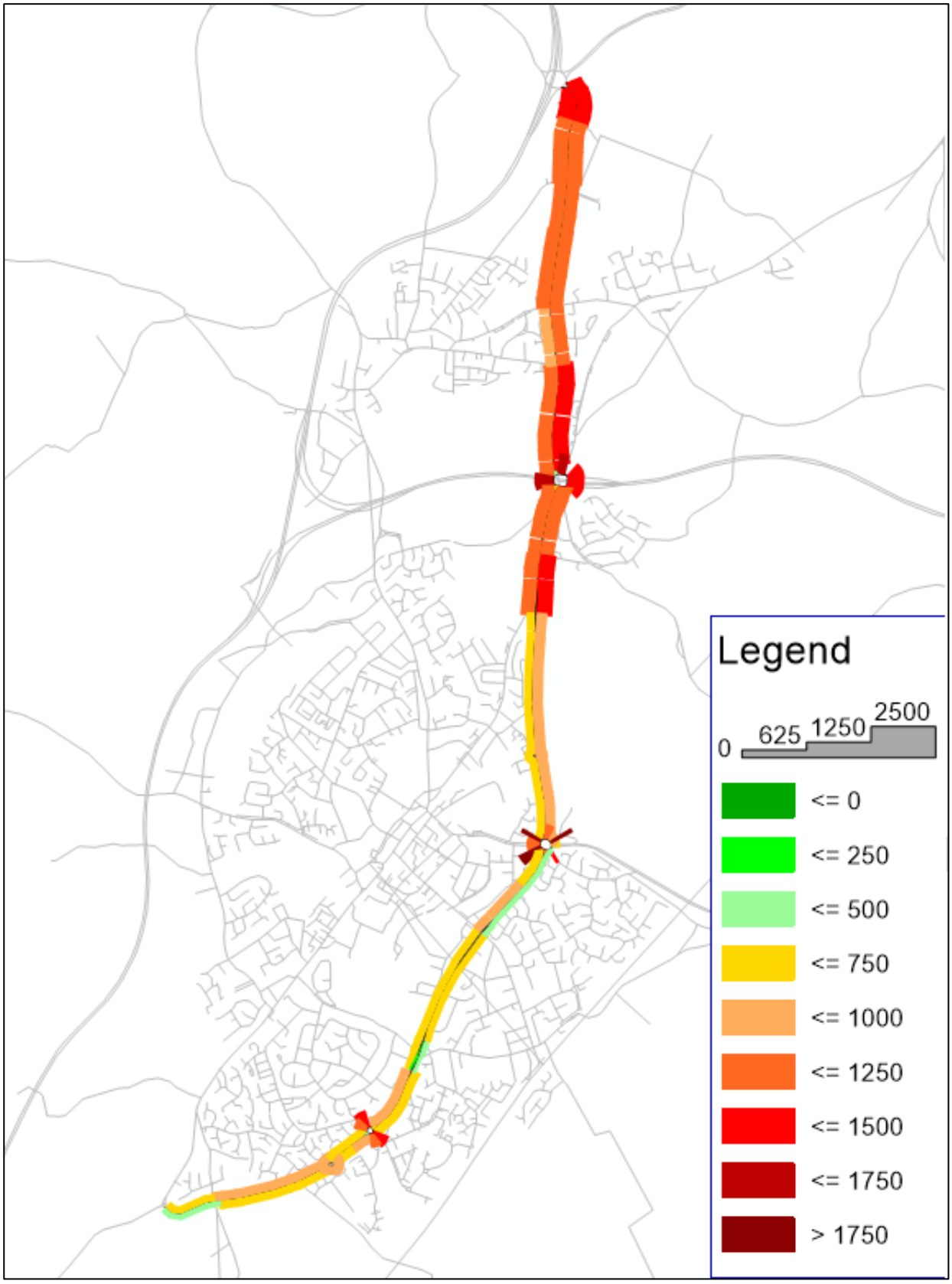
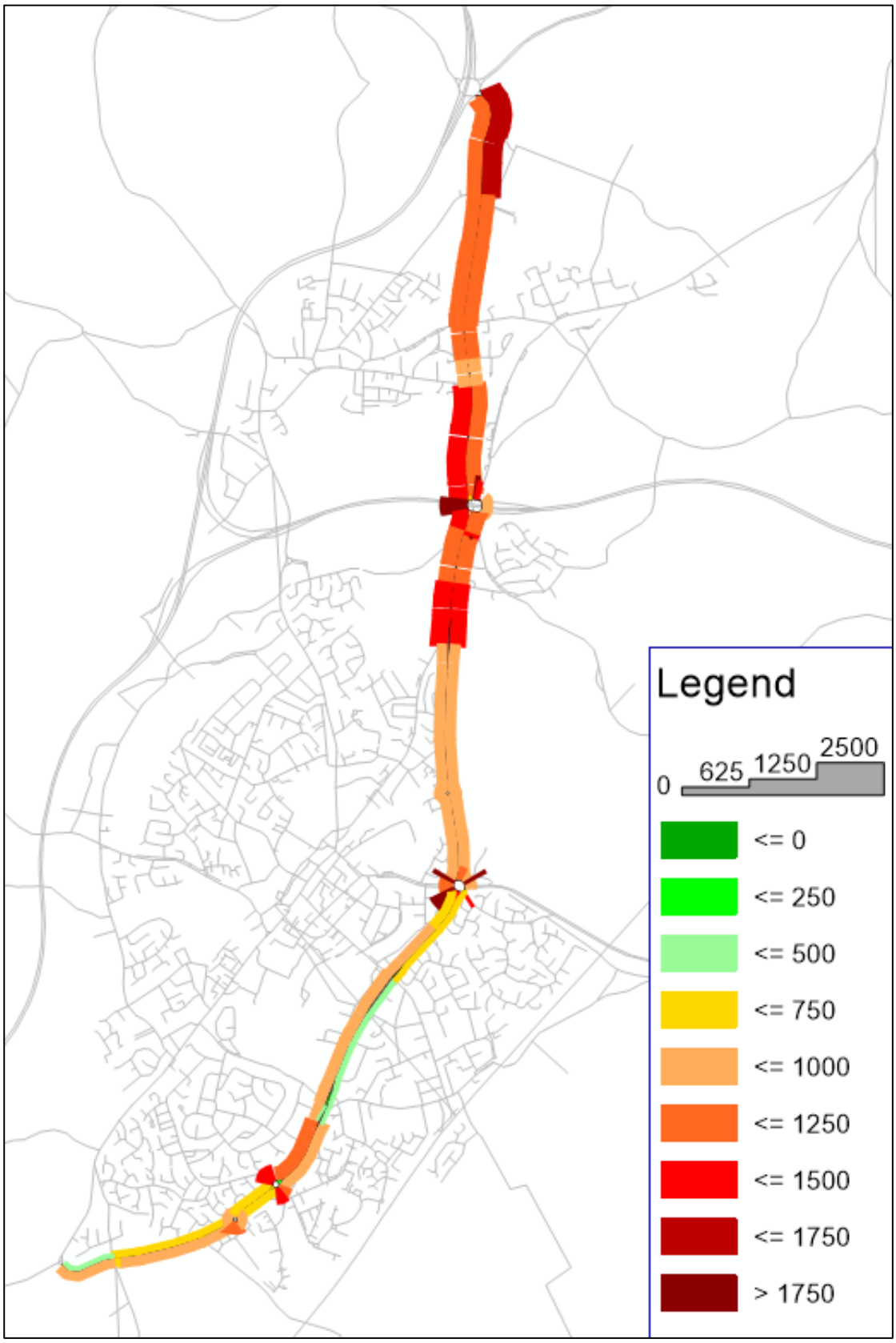


Figure 3.55 - Modelled 2040 traffic volumes – Do Minimum – PM peak



3.3.2.3 Journey Times

The modelled journey times along the corridor are shown in Figure 3.56 to Figure 3.61. Figure 3.56 shows that there is a small increase in AM peak journey time between the 2017 Base journey time and the 2025 Do Minimum scenario, in 2040 there is a significant jump in journey time, between the New Road and A448/A38 junction. In the southbound direction, as shown in Figure 3.57, there is a general increase across the route in both 2025 and 2040 Do Minimum scenarios.

Figure 3.58 and Figure 3.59 shows that there is a minimal increase in Inter Peak journey time between the 2017 Base journey time and the 2025 and 2040 Do Minimum scenarios in either direction.

Figure 3.60 and Figure 3.61 shows that there is a small decrease in journey time with the 2025 Do Minimum scenario compared to the 2017 base journey time for routes along the A38 corridor, the route then deteriorates in the 2040 scenario in both directions from the 2017 base period, in both directions.

Figure 3.56 – Northbound AM journey times from VISUM model

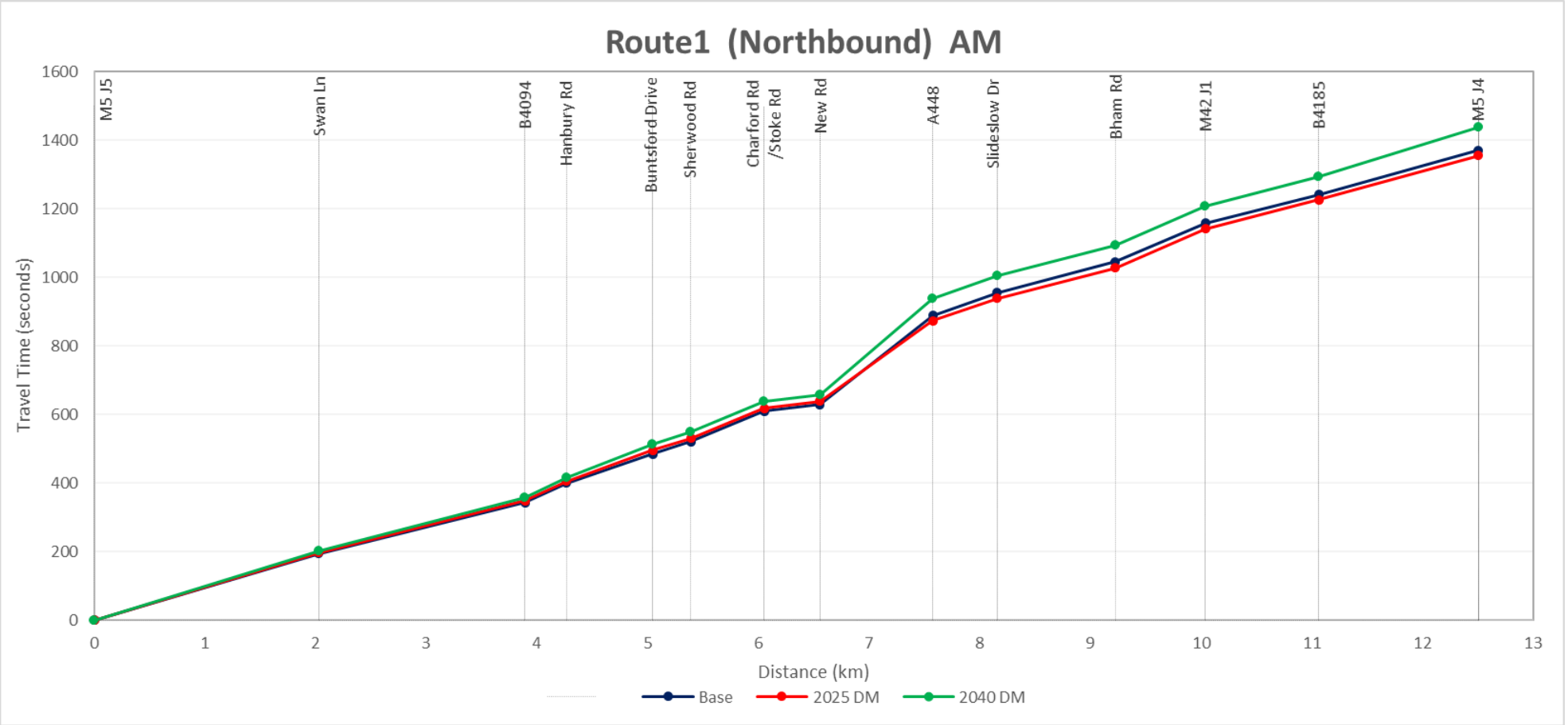


Figure 3.57– Southbound AM journey times from VISUM model

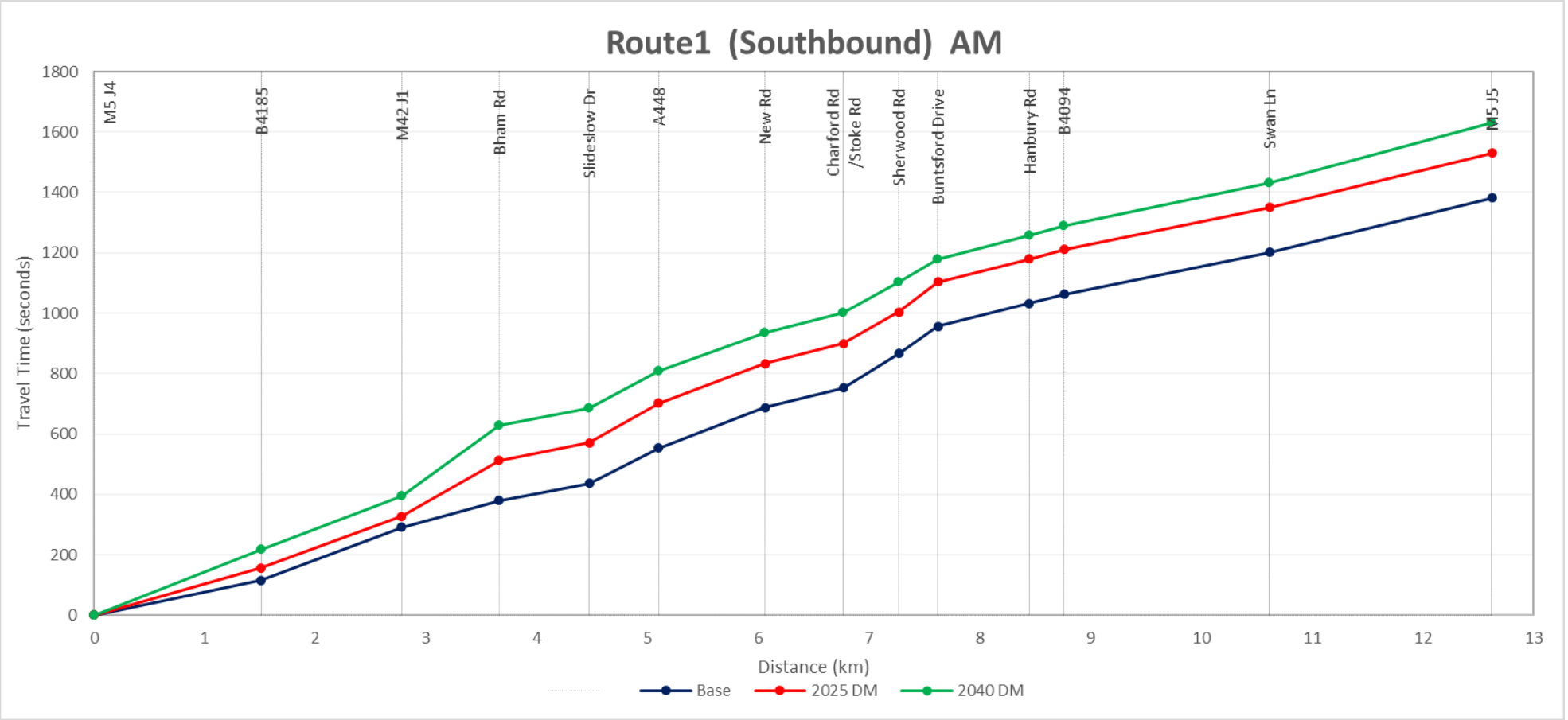


Figure 3.58 – Northbound IP journey times from VISUM model

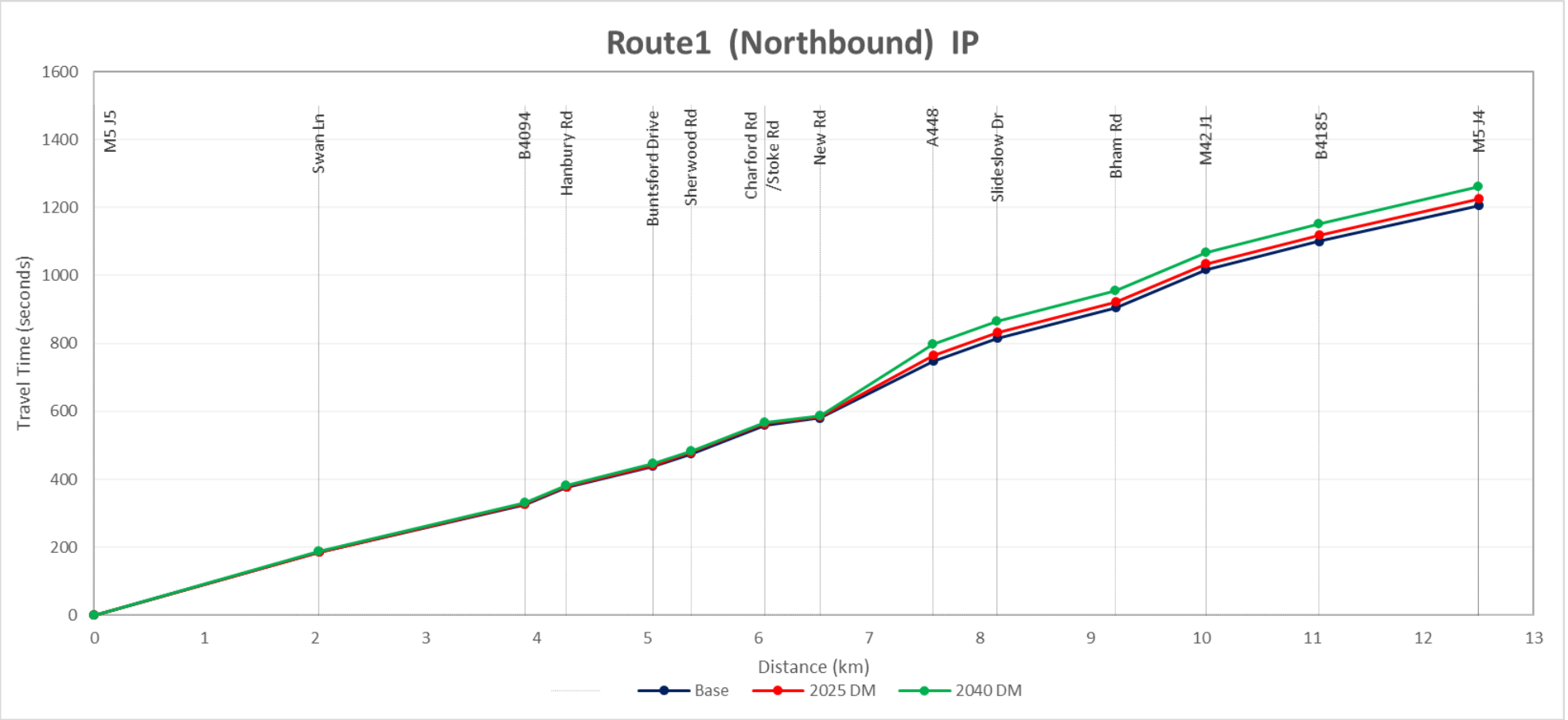


Figure 3.59 – Southbound IP journey times from VISUM model

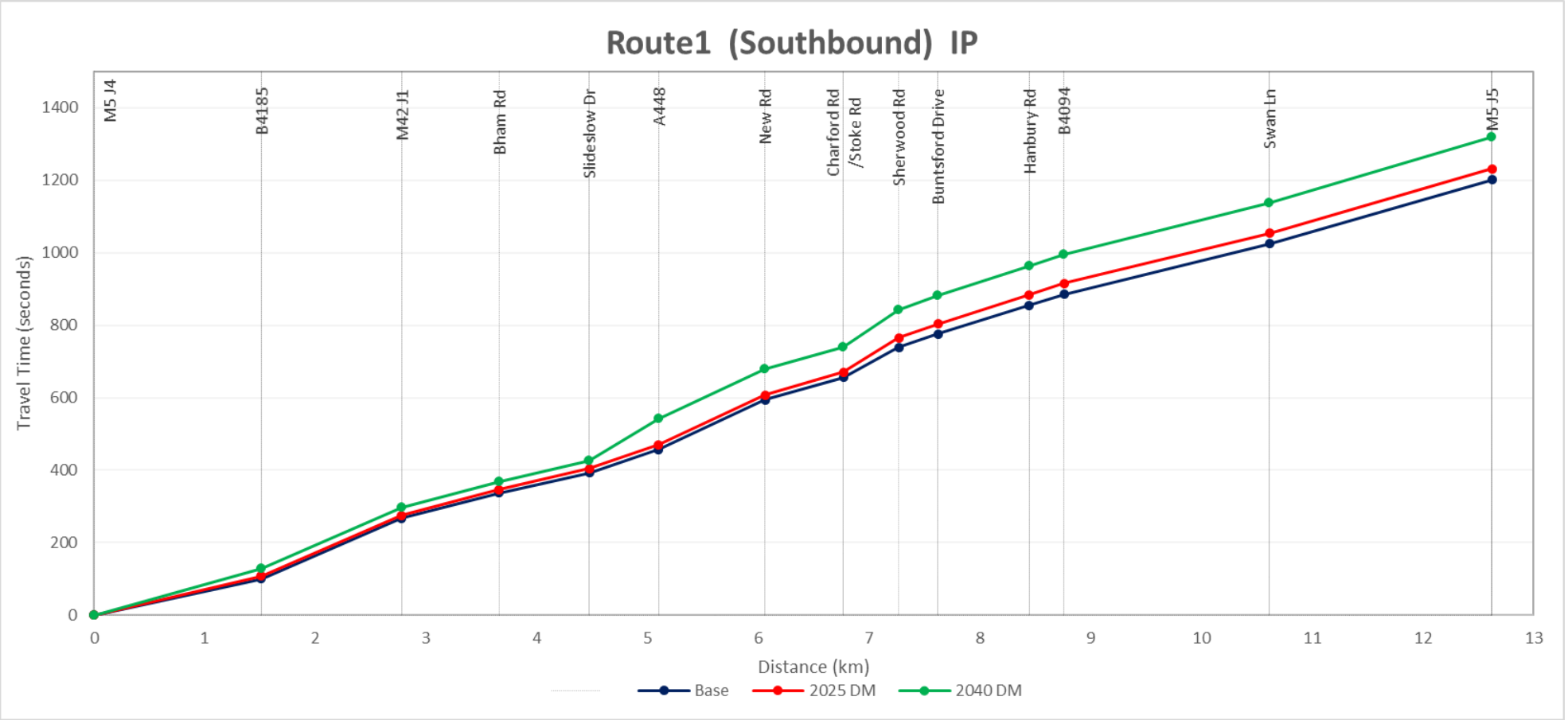


Figure 3.60 – Northbound PM journey times from VISUM model

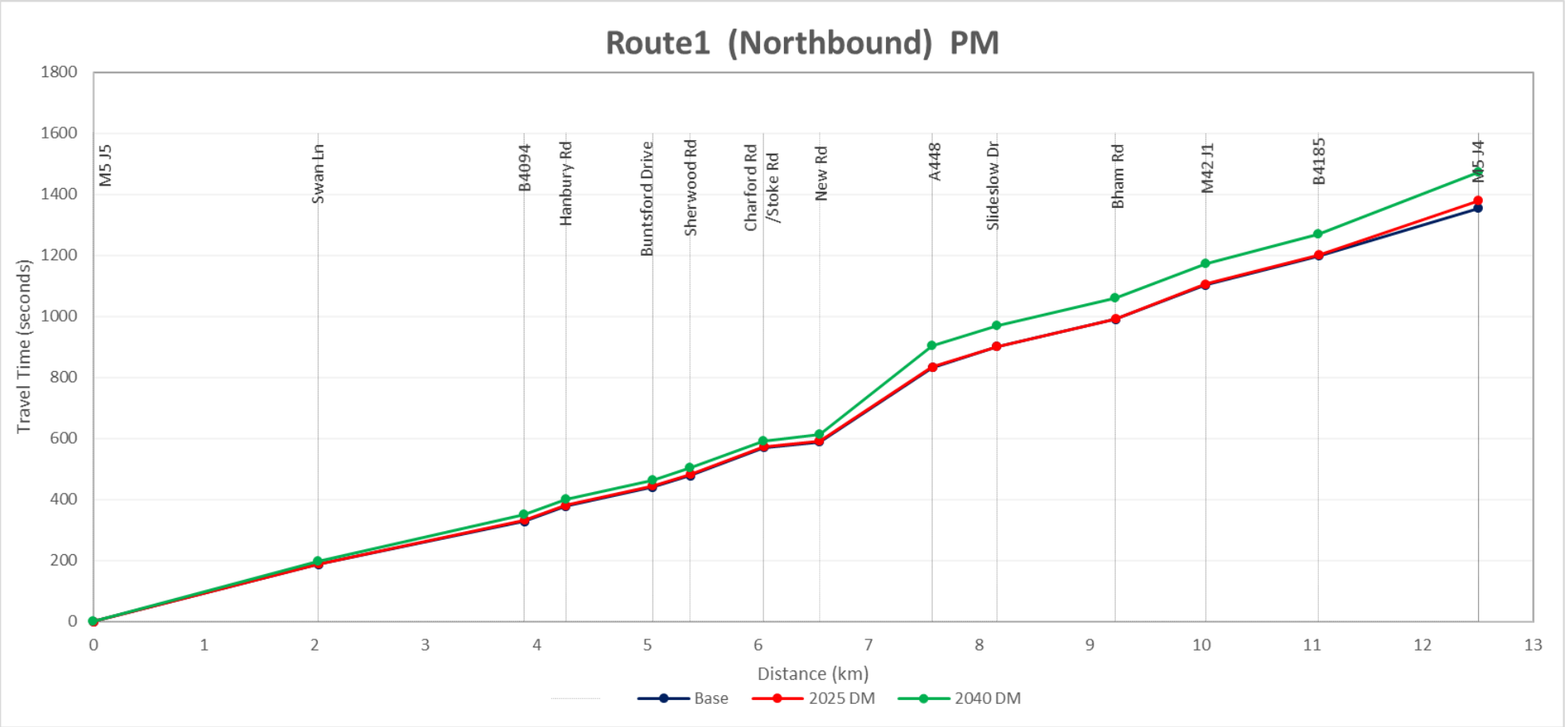


Figure 3.61 – Southbound PM journey times from VISUM model

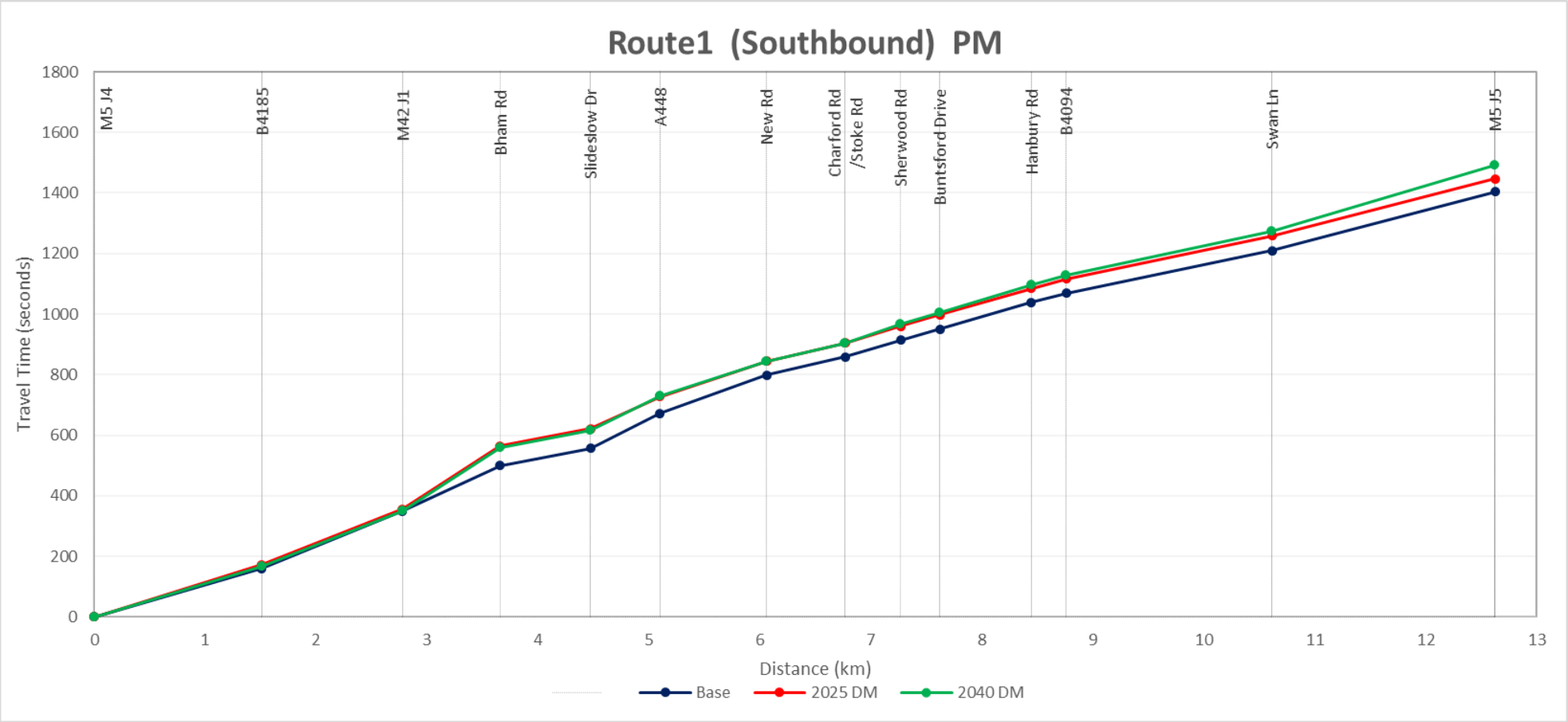


Table 3.35 sets out the journey time data for the route in the 2017 base, plus 2025 and 2040 Do Minimum scenarios. Congestion and delay at junctions affect the strategic role of the A38, both delaying traffic that is trying to reach the SRN or using the corridor as a diversionary route, as well as hindering local traffic trying to move around Bromsgrove.

Table 3.35 – Journey Time Information from VISUM Modelling (Base plus Do Minimum Scenario)

Peak / Direction	2017 Base	2025 DM	2040 DM
AM Northbound	22 mins 51 secs	22 mins 35 secs	23 mins 59 secs
AM Southbound	23 mins 1 secs	25 mins 31 secs	27 mins 12 secs
Inter Peak Northbound	20 mins 6 secs	20 mins 25 secs	21mins
Inter Peak Southbound	20 mins 1 secs	20 mins 32 secs	21 mins 59 secs
PM Northbound	22 mins 35 secs	23 mins	24 mins 34 secs
PM Southbound	23 mins 24 secs	24 mins 7 secs	24 mins 52 secs

3.3.2.4 Enabling and Promoting Growth

Pressure on the A38 corridor will increase in the future due to the development targets for housing and employment growth across both Bromsgrove and Redditch as explained earlier in this FBC. The planned growth in housing will increase the demand for travel. The future year transport modelling work captures this increased demand. Table 3.36 sets out the proportion of growth applied by journey purpose and mode, between the 2025 and 2040 forecast years and base scenarios (2017).

Table 3.36 – Modelled Growth based on TEMPro V7.2, forecast year (2025 and 2040) versus base scenario (2017)

	2025 Versus 2017 - AM	2025 Versus 2017 - IP	2025 Versus 2017 - PM	2040 Versus 2017 - AM	2040 Versus 2017 - IP	2040 Versus 2017 - PM
Work	6.2%	5.6%	5.5%	17.4%	14.6%	14.4%
Business	5.6%	5.5%	5.7%	15.2%	14.7%	15.5%
Others	9.5%	9.4%	10.0%	24.7%	24.0%	26.4%
LGV	5.3%	5.3%	5.4%	14.8%	13.5%	14.8%
HGV	7.0%	7.1%	7.6%	18.3%	18.2%	20.3%
Total	12.9%	12.9%	13.0%	36.1%	36.1%	36.3%

3.3.2.5 Comparison Plots

Figure 3.62 and Figure 3.63 show the growth in traffic levels between the 2017 Base and 2040 Do Minimum scenarios, the red lines show an increase in traffic. It should be noted that the links of Perryfields Road, A448 in vicinity of Perryfields Road and a section to the west of A38/A448 show a larger volume of trips than is truly the case due to changes in the model as a result of new roads being added, or splitting of links to support changes at the Do Something scenario.

The comparison plots demonstrate that there is an increase in trips as a result of Local Plan growth across the Bromsgrove area, the exception to this is the A38 corridor, which as a capacity constrained corridor is not able to increase traffic volumes as a result of traffic growth, thus resulting in a small reduction in traffic volume, without improvements.

Figure 3.62 - 2040 DM minus 2017 AM peak – VISUM comparison

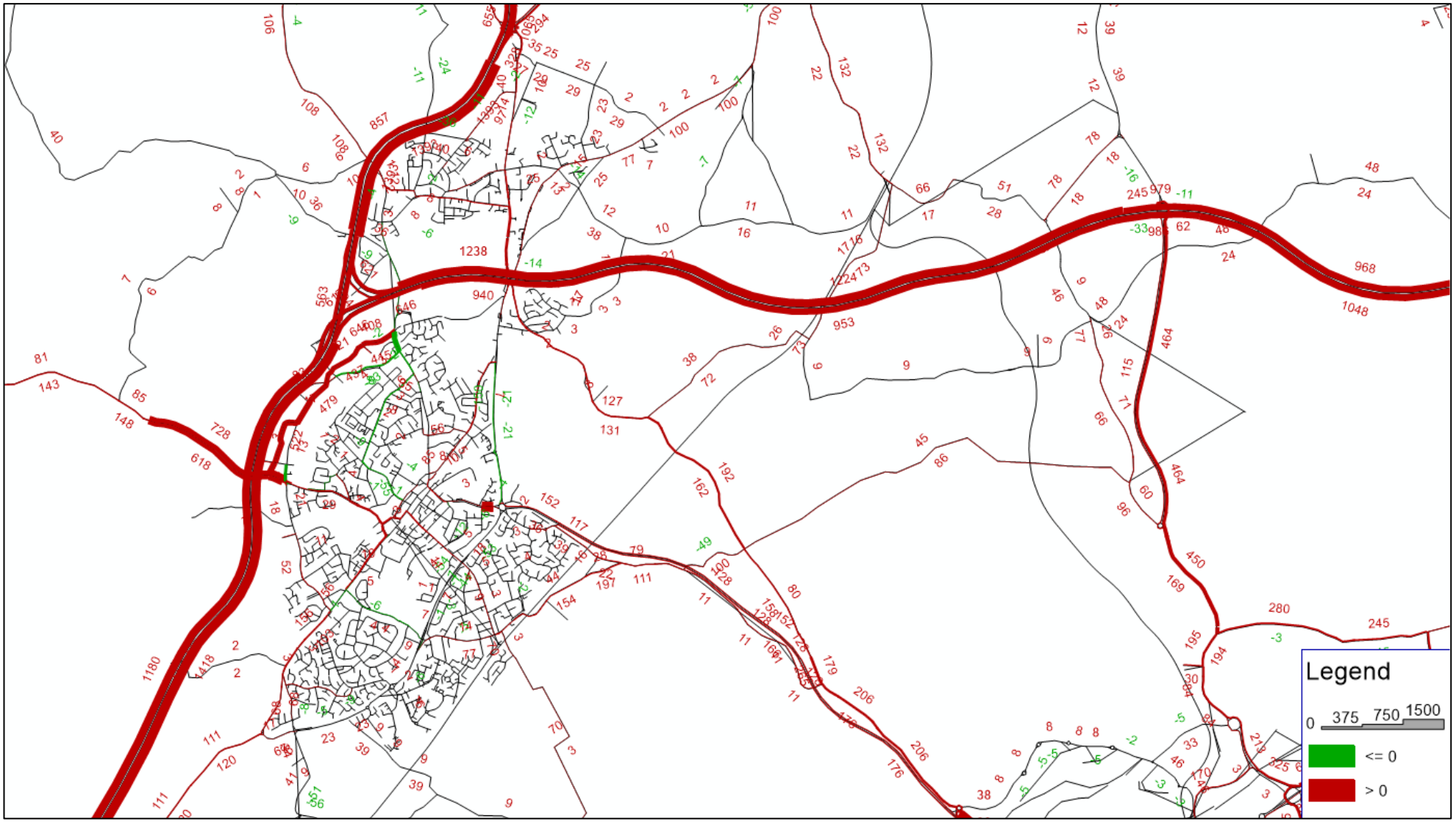
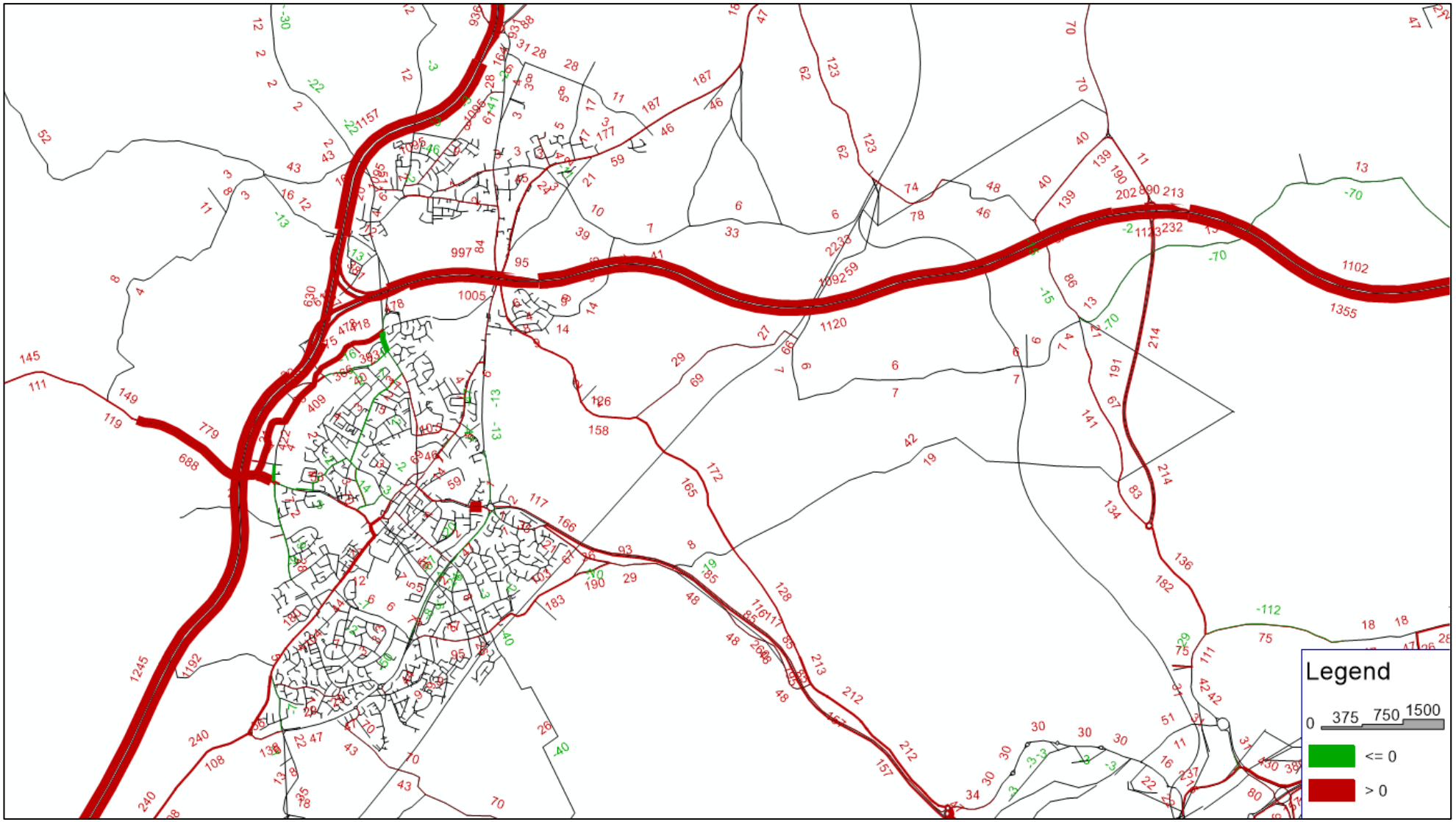


Figure 3.63 - 2040 DM minus 2017 PM peak – VISUM comparison



The 2040 VISUM Do Minimum model indicates that in neither the AM or PM peak that the Value /Capacity (V/C) ratio is exceeded indicating that there are no concerns with regards to link problems (Figure 3.64 and Figure 3.65). This indicates that the problems on the A38 corridor are linked to the junction performance. Figure 3.66 and Figure 3.67 present the junctions that have a level of delay of more than 5 seconds.

Figure 3.64 – 2040 Do Minimum AM peak – V/C ratio

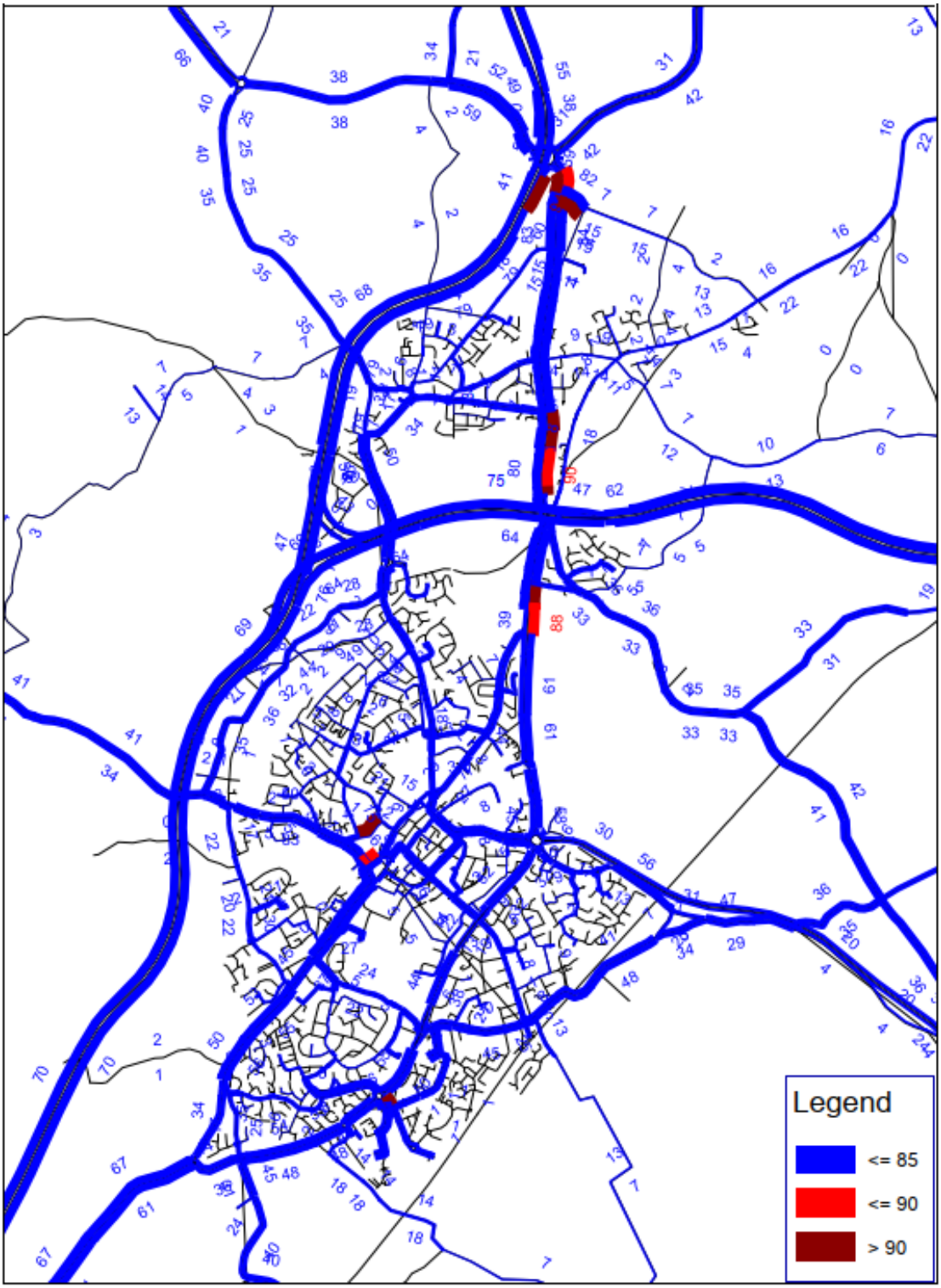


Figure 3.65 - 2040 Do Minimum PM peak – V/C ratio

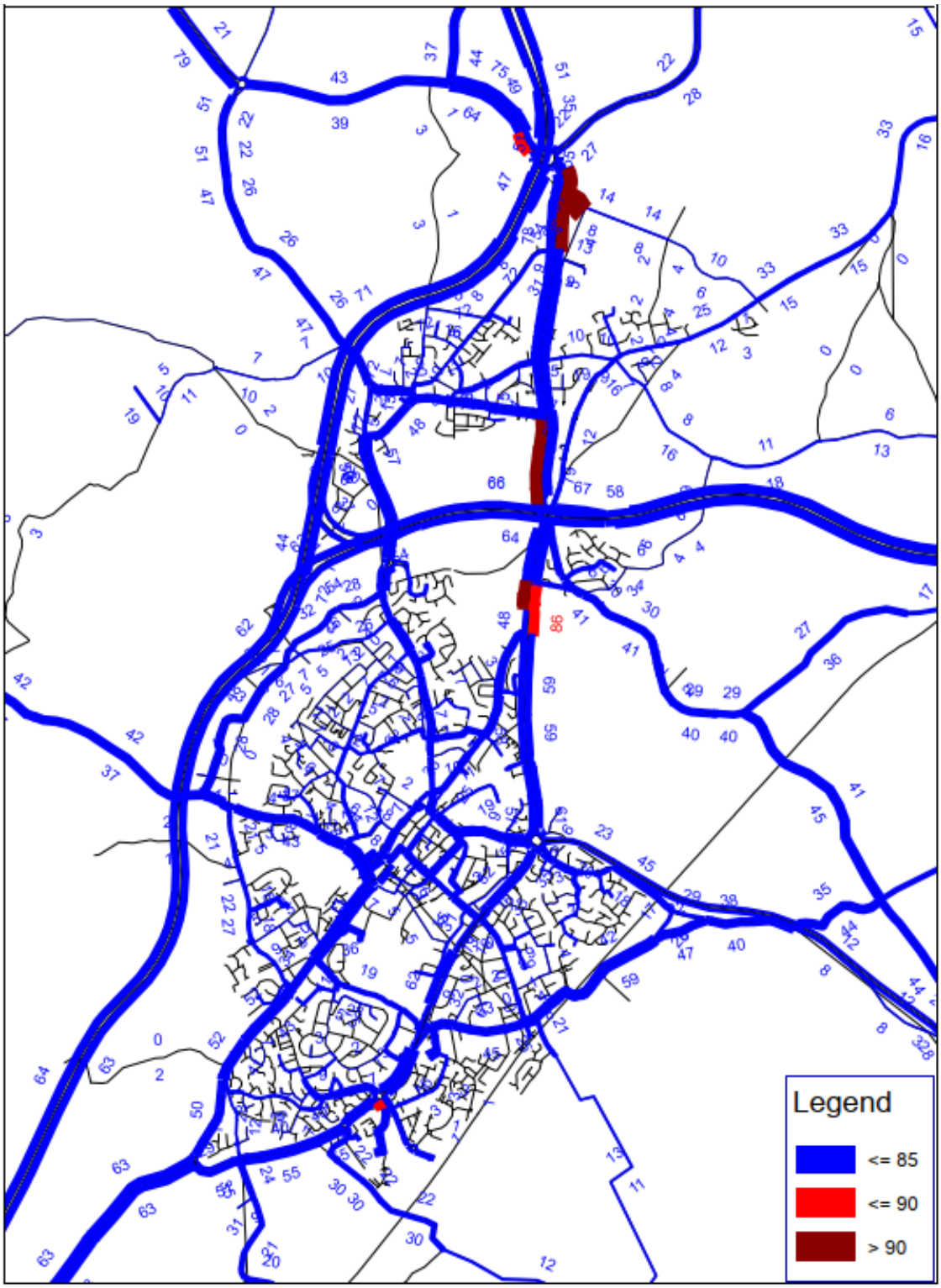


Figure 3.66 – 2040 Do Minimum delay hotspots at junction nodes – AM peak

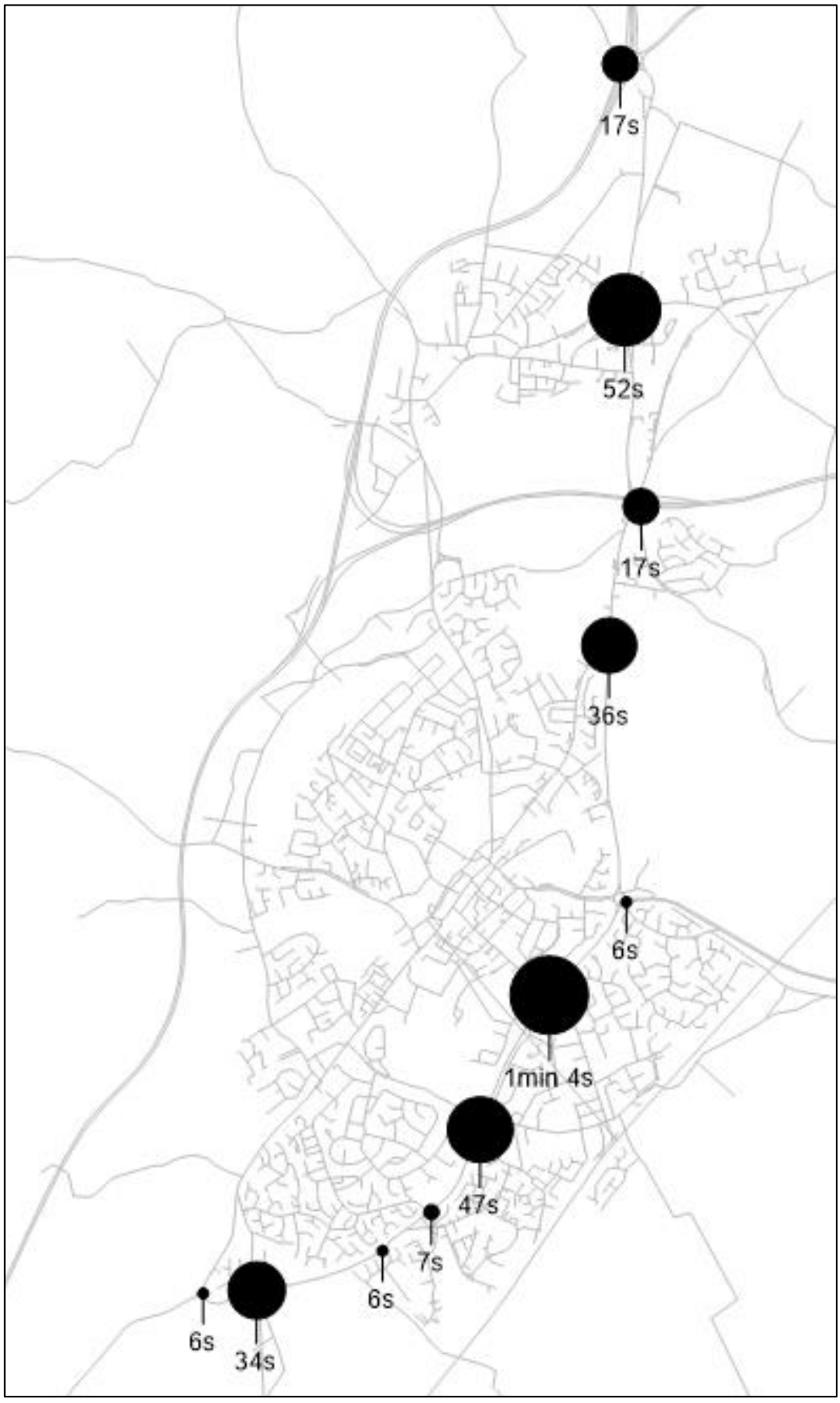
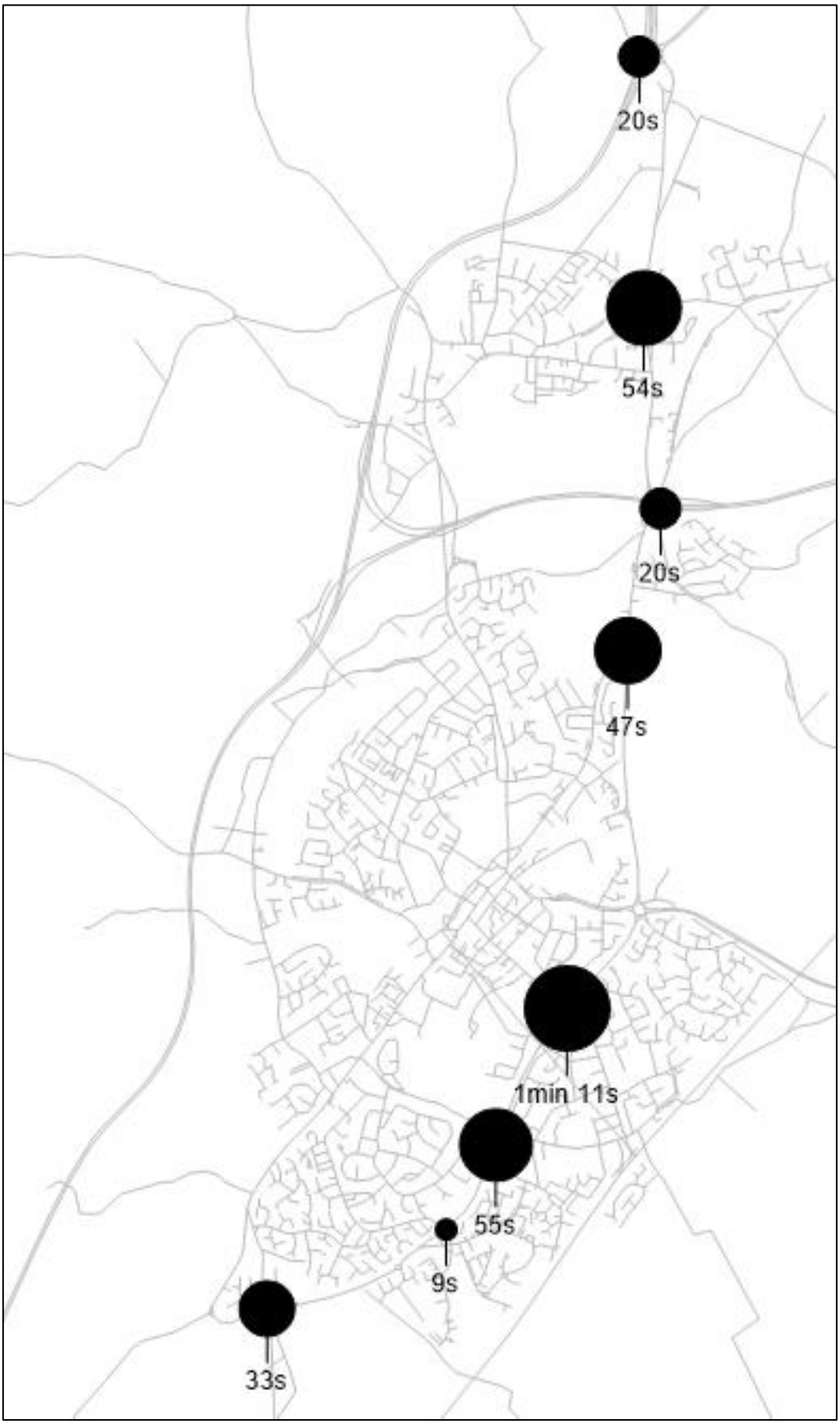


Figure 3.67 - 2040 Do Minimum delay hotspots at junction nodes – PM peak



3.3.2.6 Traffic Queues

Forecast queues in 2040 are set out in chapters 8 to 16 of the OAR (Appendix S.1).

3.3.3 Business Need and Service Gaps

With the high levels of congestion and car usage within Bromsgrove, and the inadequacy of existing provisions for sustainable modes of transport, future congestion will discourage the investment and development of the area as identified in the GBSLEP and WLEP SEP which would hinder economic growth and the overall potential of Bromsgrove and Worcestershire will not be realised.

While the above is the main internal drive, this approach of enhancing provisions of sustainable modes of transport has been encourage by the increasing focus on considerably enhancing active mode provisions and on emphasis on decarbonisation by central government, which is the main external drive. The feedback of several engagement events held to support the A38 BREP demonstrated stakeholders and public support.

3.3.4 Impact of Not Changing

Without the A38 BREP Phase 3 schemes, the existing and future problems and issues outlined in sections 3.3.1and 3.3.2 will continue and, in the longer-term, be exacerbated. In summary, the impact of not changing would be that:

- Traffic congestion levels are expected to increase in the 2040 scenarios.
- High volumes of traffic expected north of Birmingham Road junction in both 2025 and 2040 Do Minimum scenarios.
- Journey times forecast to increase in 2025 and 2040 Do Minimum scenarios in all peak periods.
- Significant increase in growth related to Local Plan development.
- It would be reasonable to expect that increase in congestion and journey time would lead to a higher degree of variability in the journey and thus unreliability.
- Queues are forecast to increase in the Do Minimum scenarios.
- The ability to encourage mode shift to walking and cycling will be limited due to continued actual and perceived severance caused by the A38.

Ultimately, not delivering significant enhancements to the A38 corridor will mean that the objectives of key policies set out by the LEPs in their SEPs, by WCC in the LTP4 and the District Council's in the Local Plans (described in section 3.2), will not be realised. Table 3.37 below provides further detail.

Table 3.37 – Extent to which problems are likely to threaten achievement of policy objectives

Problem/issue	How this threatens key local policy, strategy or priorities
Congestion	Issues have been identified in chapters 3.3.1 and 3.3.2, setting out the high levels of car usage within Bromsgrove, limited alternative mode provisions. The congestion that has been identified in the future scenarios will discourage the investment and development of the area as identified in the GBSLEP and WLEP SEP, and not addressing the pinch points on the corridor would hinder economic growth and the overall potential of Bromsgrove and Worcestershire will not be realised.
Reliability and resilience	The 2017 data in terms of journey times, demonstrates an unreliable journey time on the A38 corridor, this is expected to deteriorate leading to even more unreliability with no enhancements. As such the unreliability of the route today and in the future is in contrast to the aims of LTP4. Overall, the reduction of journey time is also in line with the key objective of the WCC Corporate Plan.
Enabling and promoting growth constrained by future congestion	The level of forecast growth expected is significant as defined within the Local Plans, and as per the traffic modelling chapter and appendices. The Local Plans recognise that, in order to deliver this growth level, infrastructure improvements are required to support the growth aspiration.
Pedestrians and cyclists	Within Bromsgrove there are significant gaps in walking and cycling routes, along and across the A38 corridor and in the wider area. The A38 is hostile to non-motorised users looking to cross without intervention and would lead to severe severance.

3.4 The Investment Proposal

3.4.1 SMART Objectives

Table 3.38 shows the A38 BREP Phase 3 schemes objectives. Initial objectives were agreed by Project Board in 2015/16 for the original scheme development stage as part of the WLEP OBC stage. Prior to submission of the SOC to DfT in July 2019, the objectives were reviewed to ensure that they remained in line with current policies at the time, and a further objective was added which was focussed on pedestrians and cyclists. There is no change in the scheme objectives since the OBC submission in November 2021.

Overall, the objectives are based on the problem identification, align with the overall objectives of LTP4 and address the key challenges that the LTP identifies for North East Worcestershire. The combined effect of delivery of SMART objectives enables tackling the area's Levelling Up priorities.

Table 3.38 – A38 BREP Phase 3 schemes objectives

A38 objectives	Rationale
Reduce congestion and transport costs	The A38 corridor is currently congested. Limited capacity at key junctions results in queuing, which contributes to delay, air quality issues impacting communities and businesses along the route. This is projected to worsen in the future. Reducing congestion on the A38 (compared to a do nothing/without scheme scenario) will help support economic growth by better linking Bromsgrove with major employment areas across the West Midlands. This objective aligns with the MRN objectives to ease congestion and provide upgrades on important national or local routes and support the SRN.
Maximise the efficiency of the road network	The A38 performs multiple functions, serving as a key part of the MRN, providing a connection to the motorway and SRN, as well as a bypass and local access route. For the route to function in its role as part of the MRN, it is important that journeys along the A38 and onto the SRN are seamless, with reliable journey times and without delay. This objective aligns with the MRN objectives to ease congestion and provide upgrades on important national or local routes and support the SRN.
Increased journey time reliability	Journey time reliability on the A38 corridor is highly variable as set out in section 3.3.1.8, with journeys in the peak periods taking markedly longer than during the inter-peak. Reducing both journey time and its variability is important to ensure that journeys along the A38 and onto the SRN are reliable and to ensure that the A38 is appropriately used by local traffic so that traffic does not need to divert onto other less appropriate routes to avoid pinch points along the A38. This objective aligns with the MRN objectives to ease congestion and provide upgrades on important national or local routes and support the SRN.
Support the delivery of housing and employment growth as outlined in the Bromsgrove District Plan and the Redditch Local Plan	The network around Bromsgrove, including the A38, is currently constrained and significant improvements are required to support future development. This is recognised through the requirement for key sites coming forward from the 2017 adopted Local Plan allocations to provide Section 106 contributions to this scheme. This objective aligns with the MRN objectives to unlock economic growth and enable the delivery of new housing developments.
Improve connectivity for pedestrians and cyclists on and across the A38 corridor, including to Bromsgrove Rail Station	This objective is consistent with the overall approach to transport in Bromsgrove currently being pursued by WCC. This has 4 strands: improving the A38, improving the local road network, improving facilities for pedestrians and cyclists and improving access to public transport through building on the success of BoD and contributing to DRT recently launched by WCC (including maximising the role of the Rail Station). Improving east west connectivity across the A38 corridor is vital to address the severance effect currently experienced. In addition, new and improved north-south connections for pedestrians and cyclists are important to link residential and employment areas, and east west routes. Overall connections need to support the current cycle network that has been developed by the NPIF project. This objective aligns with the MRN objective to support all road users.

The objectives reflect the following key problems and challenges identified.

- Congestion – Traffic congestion levels are expected to increase in the 2040 scenarios. High volumes of traffic expected north of Birmingham Road junction in both 2025 and 2040 Do Minimum scenarios. Queues are forecast to increase in the Do Minimum scenarios. Overall congestion affects the strategic role of the A38 delaying traffic that is trying to reach the SRN or using the corridor as a diversionary route, as well as hindering local traffic.
- Reliability and resilience – Journey times forecast to increase in 2025 and 2040 Do Minimum scenarios in all peak periods. It would be reasonable to expect that increase in congestion and journey time would lead to a higher degree of variability in the journey and thus unreliability. Unreliable journey times impact on the role of the corridor as a strategic link for accessing the SRN, urban areas and key employment areas south of Birmingham and impact route choice for local trips.
- Enabling future housing and employment growth - Significant increase in growth related to Local Plans development targets will increase pressure on the A38 corridor in the future. Capacity along the A38 corridor will need to be improved in order to accommodate planned and future growth, elsewhere, future congestion will discourage the investment and development of the area as identified in the GBSLEP and WLEP SEP which would hinder economic growth and the overall potential of Bromsgrove and Worcestershire will not be realised.
- Conditions for pedestrians and cyclists – The ability to encourage mode shift to walking and cycling will be limited due to continued actual and perceived severance caused by the A38 which will deter the use of walking and cycling for local trips and to the Rail Station. This contributes to congestion and poor air quality, directly impacting on the communities that live along the corridor.

Table 3.39 shows how the objectives address/relate to the problems identified on the A38 corridor.

Table 3.39 – A38 objectives and problems

Problems identified on the A38 Corridor	Obj. 1: Support the delivery of housing and employment growth	Obj. 2: Reduce congestion and transport costs	Obj. 3: Maximise the efficiency of the road network	Obj. 4: Increased journey time reliability	Obj. 5: Improve conditions for pedestrians and cyclists
Congestion		√	√	√	
Reliability and resilience		√	√	√	
Enabling and promoting growth	√				
Pedestrians and cyclists		√	√		√

The A38 objectives align closely with the MRN objectives, as shown in Table 3.40.

Table 3.40 – A38 BREP objectives and MRN objectives

A38 BREP Objectives	MRN Objectives				
	Reducing Congestion	**Support economic growth and rebalancing**	**Support housing delivery**	**Supporting all road users**	**Supporting the SRN**
Support the delivery of housing and employment growth		√	√		
Reduce congestion and transport costs	√				√
Maximise the efficiency of the road network	√			√	√
Increased journey time reliability	√			√	√
Improved conditions for pedestrians and cyclists	√	√	√	√	
Summary	Junction improvements and pedestrian and cycle infrastructure will reduce congestion and delay, improving journey times and reliability.	Enable the A38 corridor to function effectively for businesses and workers.	Junction improvements will enable the highway network to offset some of the development impact.	Pedestrian and cycle improvements enhance provisions along and across the A38 which should support a degree of modal shift.	Improvements to the A38 improve conditions on the SRN and access to/from the SRN.

3.4.2 Scope

The scheme for which funding is sought via this MRN bid is the A38 BREP Phase 3 and it comprises interventions which target all modes, including highway, active mode and public transport schemes. This section should be read alongside:

- Appendix S.1, the OAR, which describes the process of scheme identification and development.
- Appendix S.4, which contains drawings of each of the proposed schemes.
- Appendix S.7, which presents an addendum to the OAR including further options development, namely Schemes 3 and 9.

The package has evolved through the SOC and OBC stages which is presented in section 3.1.3.1, while section 3.1.3.2 fully explain the changes since the OBC submission. The FBC stage A38 MRN bid includes the following schemes:

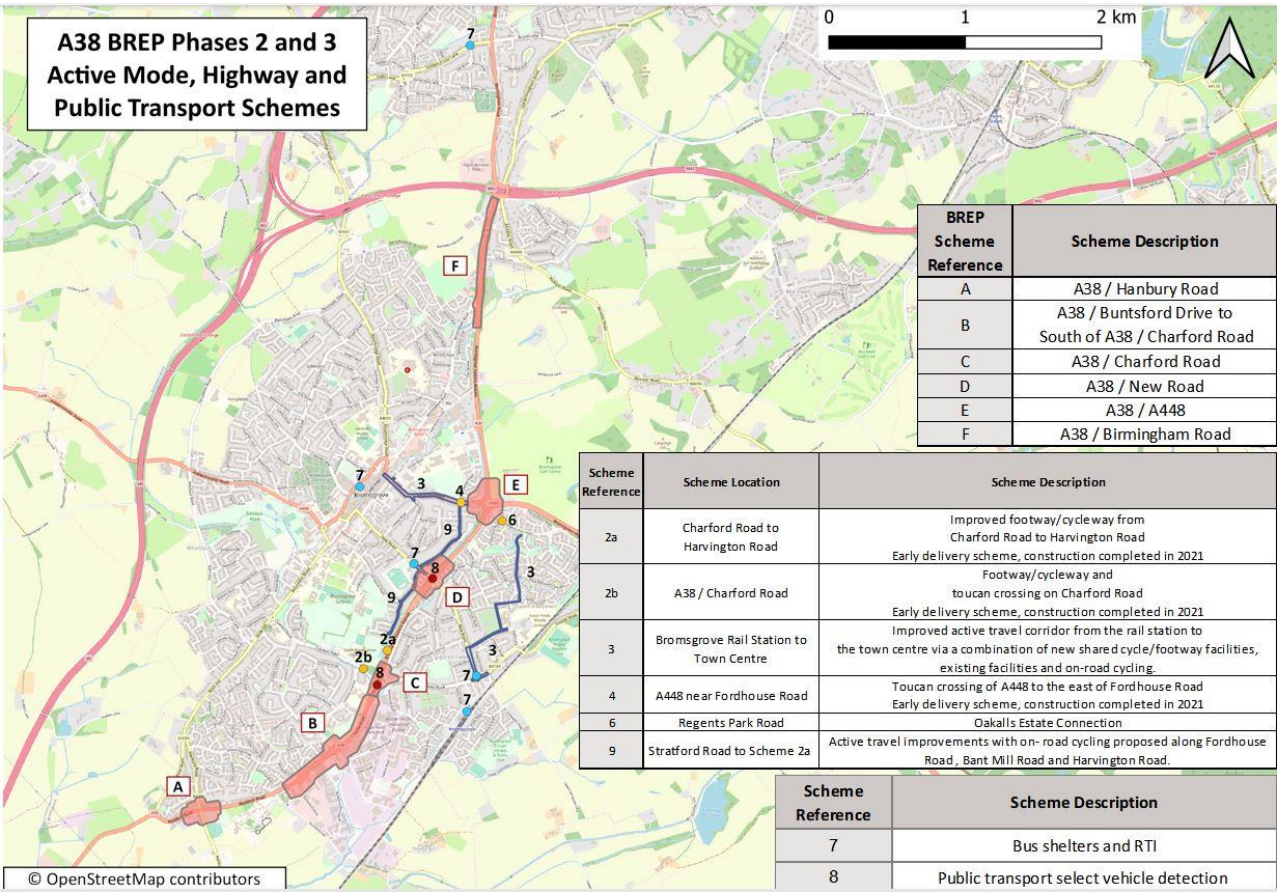
- Phase 2 Schemes 2a, 2b and 4: These three schemes have been taken forward as early delivery schemes, funded by WLEP which has its own FBC. Hence, they are reflected in Phase 3 Do Minimum scenario, and their impacts are therefore not assessed as part of the modelling and economic assessment work carried out as part of this MRN FBC (which is considered to be aligned with the TAG requirements). This is consistent with the approach adopted in the OBC submission. Construction of these schemes began on site at the end of 2020 and are now complete.

- Phase 3 includes three active mode, two local public transport and six hybrid highway and active travel improvement schemes:
    - Three active mode improvement schemes, namely Schemes 3, 6 and 9.
    - Two local public transport improvement schemes (notated as schemes 7 and 8) which have not changed compared to the OBC stage.
    - six hybrid schemes containing highways capacity and active travel improvements which were included in the OBC submission. These are Schemes: C to F and parts of Schemes A and B (only limited elements of the latter two schemes have been moved to Phase 4).

Phase 4 includes schemes that were originally included at the OBC stage, but since then they have been moved to Phase 4 due to higher inflation experienced in 2022, resulting in increased scheme cost. Phase 4 schemes have been removed from all aspects of this bid and will be progressed once alternative funding sources are secured hence will be subject to a separate business case. Figure 3.68 provides an overview of Phases 2 and 3 highway, active modes and public transport schemes, while Table 3.41, Table 3.24 and Table 3.43 below present description of these schemes. Section 3.1.3.2 provides more details on the changes since the OBC submission.

It should be noted that all assessment work carried out within the FBC includes updates to reflect the changes since the OBC submission (only Phase 3 schemes in the Do Something scenario). This includes (but not limited to) updates to the traffic, air quality and noise modelling, active modes appraisal, finance information, economic assessment in addition to updates to the Management and Commercial Dimensions. Environment assessment and consenting (including noise and air quality) are based on Phases 3 and 4 as requested by WCC Regulatory Services. The overall approach to modelling and assessment is consistent with the approach adopted for the OBC submission.

Figure 3.68 – Phases 2 and 3 highway, sustainable transport and public transport schemes



BREP Scheme Reference	Scheme Description
A	A38 / Hanbury Road
B	A38 / Buntsford Drive to South of A38 / Charford Road
C	A38 / Charford Road
D	A38 / New Road
E	A38 / A448
F	A38 / Birmingham Road

Scheme Reference	Scheme Location	Scheme Description
2a	Charford Road to Harvington Road	Improved footway/cycleway from Charford Road to Harvington Road Early delivery scheme, construction completed in 2021
2b	A38 / Charford Road	Footway/cycleway and toucan crossing on Charford Road Early delivery scheme, construction completed in 2021
3	Bromsgrove Rail Station to Town Centre	Improved active travel corridor from the rail station to the town centre via a combination of new shared cycle/footway facilities, existing facilities and on-road cycling.
4	A448 near Fordhouse Road	Toucan crossing of A448 to the east of Fordhouse Road Early delivery scheme, construction completed in 2021
6	Regents Park Road	Oakalls Estate Connection
9	Stratford Road to Scheme 2a	Active travel improvements with on- road cycling proposed along Fordhouse Road , Bant Mill Road and Harvington Road.

Scheme Reference	Scheme Description
7	Bus shelters and RTI
8	Public transport select vehicle detection

Table 3.41 – Hybrid schemes containing highways capacity and active travel improvements included in the FBC stage (Phase 3)

Ref.	Scheme location	FBC Description of proposed scheme
A	A38 / Hanbury Road	Provide a longer left turn lane on the Eastern A38 approach, undertaking using white lining and carriageway surfacing, within existing kerb line.
B	A38 / Buntsford Drive to south of A38 / Charford Road	Provision of an additional northbound traffic lanes from A38/ Sherwood Road/Austin Road Roundabout to A38 / Charford Lane approach. New toucan crossings over Sherwood Road and A38 North. Development of Active Travel Corridor Link parallel to A38, providing a 3m wide shared footway/cycleway from Buntsford Drive Sherwood Road and a segregated pedestrian / cycle route on the east side of the A38 between Sherwood Road to Charford Road (Scheme C and Scheme 2), as part of a wider cycle strategy for A38 corridor. Pedestrian / Cyclist linkage to Sherwood Road towards Bromsgrove Rail Station. Additional provision of an upgraded footway on the west side of A38.
C	A38 / Stoke Road / Charford Road	Widening of the existing narrow 60m long two-lane approach and realignment of Charford Road. Widening of Culvert on Stoke Road to facilitate third lane over structure and realign ahead and right turn movement lane to improve access into the left turn lane to the A38 Southbound. Enhance pedestrian crossing widths across A38

Ref.	Scheme location	FBC Description of proposed scheme
		corridor to 5m to support volume of pedestrians crossing over the A38 at grade. Provision of 4m wide footway/cycleway connection to link with Scheme B. Upgrade of uncontrolled crossings of Stoke Road (Upgrade to toucan) and Charford Road (Upgraded to pelican). Widen existing parking bays on Charford Road, to facilitate improved exit lane width from A38. Improved footway connection between A38 North and Warwick Avenue. Provision of on-crossing detection equipment at signals.
D	A38 / New Road	Provision of additional southbound traffic lane on A38. Realign Northbound A38 corridor to accommodate changes in southbound direction. Provision of an additional ahead lane from New Road West approach, with associated widening of A38 East exit. Provide new staggered pedestrian crossing on New Road West approach and exit in vicinity of Fordhouse Road and Bant Mill Road. Provision of wider crossing widths to support any future uplift in pedestrian movements. Provision of on-crossing detection equipment at signals. Reconfiguration of signal timings to accommodate separate phases for New Road East and West.
E	A38 / A448 (Oakalls Roundabout)	Provision of two additional flare lanes (30 and 85m) on A38 north approach. Provision of a 61m flare lane on A448 East approach. Provision of longer flare lane (100m) on A38 South approach. Provision of 46m flare on A448 West approach. Provision of toucan crossings on A38 South and A448 Stratford Road approaches. Provision of 2 lane exit on A38 South and A448 West. Provision of Pedestrian crossing facilities across A38 North and A448 West arms. Signalisation of both A38 and A448 arms. Provision of cycle connection from A448 West to Regents Park Road, to connect to Schemes 4 and 6). Provision of cycle route from A448 West toucan crossing to A38 North to link to Scheme 7). Provision of MOVA signal control. Provision of an extra exit lane westbound on the A448 Stafford Road. Inclusion of an additional circulatory lane. New footway connection from Scheme 4 on northern side of A448 West to Toucan Crossing by circulatory.
F	A38 / Birmingham Road to south of M42 Junction 1	Realignment of Birmingham Road junction, to accommodate two southbound lanes through junction, with a 3m wide footway on the eastern side of the A38, narrowing to a minimum of 2m in front of properties in front of dwelling curtilages. Provision of on crossing detection to Birmingham Road signals, and pedestrian crossing near Barnsley Hall Drive. Provision of localised widening of kerb lines to accommodate two lanes southbound from M42 J1 to Birmingham Road. School Lane to be converted to left out only, and car left in only, with associated kerb adjustments. Banning of right turn into School Lane. Consideration of lining and signing scheme on Alcester Road between School Lane and Birmingham Road (Cost excluded for Alcester Road scheme). Conversion of existing 40mph section from south of Birmingham Road to North of M42 J1 to 30mph.

Table 3.42 – Active Mode schemes included the FBC stage (Phases 2 and 3)

Ref.	Scheme Location	FBC Description of proposed scheme
2a*	Charford Road to Harvington Road	Active Travel Corridor – A38 between Charford Road and Harvington Road a 3m wide cycleway and 2m wide segregated pedestrian / cycle facility provision of connection to Harvington Road.
2b*	Charford Road to Harvington Road (extension along Charford Road)	Active Travel Corridor - Connection between the A38 and Scheme 2A to South Bromsgrove High School, to provide a 3m wide shared cycle path and footpath.
3	Bromsgrove Train Station to Town Centre	Active Travel Corridor for pedestrians and cyclists from the train station to the town centre via a combination of segregated cycle routes, new shared cycle/footway facilities, existing facilities and on-road cycling. The route follows New Road, Rigby Lane, Drummond Road, the existing shared facility in Oakalls estate to join Scheme 6, into Scheme E at Oakalls roundabout and then along Stratford Road to the Town Centre.
4*	A448 near Blackwood Road	Signal Toucan Crossing of A448 to east of Fordhouse Road, to provide connectivity between Blackwood Road (Heart of Worcestershire College) and Regents Park Road and Fordhouse Road markings, and tie into Scheme E, Schemes 3 and 9.
6	Regents Park Road Connection to Oakalls Loop	Provision of a footway/cycleway connection between Scheme E and the existing cycle provision within the Oakalls Estate of Bromsgrove, to provide further connectivity from the north and west of Bromsgrove to the station.
9	Stratford Road to Scheme 2a	Active Travel Corridor with on- road cycling proposed along Fordhouse Road, Bant Mill Road and Harvington Road including traffic calming measures and a new toucan crossing on New Road.

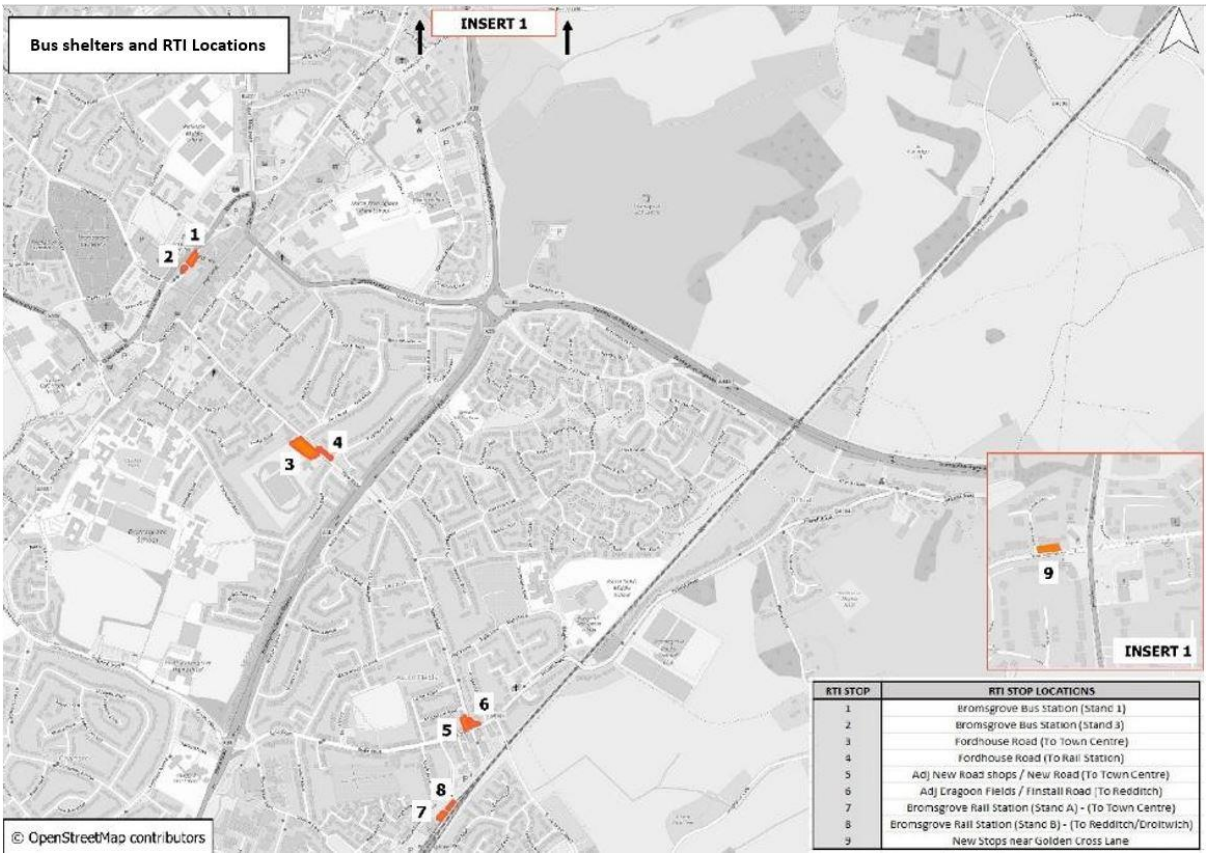
**Phase 2 Scheme 2a, 2b and 4 have been constructed as an early delivery scheme, funded by WLEP.*

Table 3.43 – Public transport schemes (Phase 3)

OBC Reference	Scheme Location	Scheme Description
7	Bus shelters and RTI	Provision of upgrades to bus stops to install additional information on the route between the Town Centre and Rail Station. This allows for 9 bus stop upgrades (including provision of physical infrastructure/shelters), plus wind turbines/solar panels powered RTI screens at Town Centre (Bromsgrove Bus Station), Fordhouse Road (By the Ryland Centre), New Road, Finstall Road (near Dragoon Field), Bromsgrove Station and new stops on Golden Cross Lane (near Marlbrook Crossroad). A Smart Interchange Point will be delivered for 1 stand at Bromsgrove Bus Station and 1 Stand at Bromsgrove Rail Station, allowing connection with the strategic corridor routes, and providing a location for DRT.

OBC Reference	Scheme Location	Scheme Description
8	Public transport select vehicle detection	Provision of select vehicle detection at New Road and Charford Road junctions to support buses in crossing the A38 corridor, on the primary routes between the Town Centre and Rail station, will be delivered at the same time as Schemes C and D.

Figure 3.69 – Scheme 7/ Shelters and RTI stop locations



3.4.3 Strategic Benefits

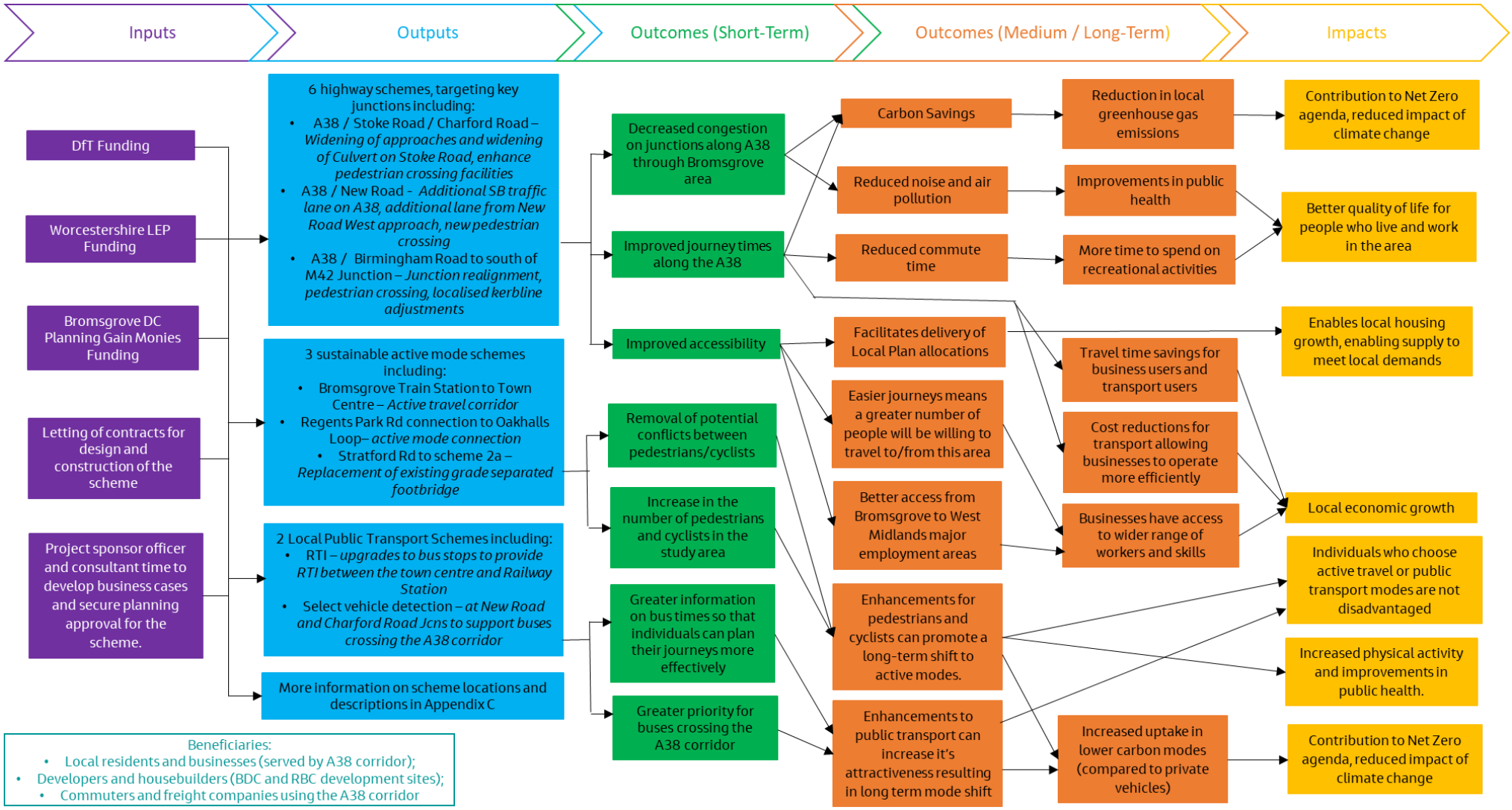
Table 3.44 sets out how success will be measured for the A38 BREP Phase 3 schemes.

Table 3.44 – Measures for success and KPIs

Objective	What success will look like?	How will it be measured?
Support the delivery of housing and employment growth as outlined in the Bromsgrove District Plan and the Redditch Local Plans.	Local Plans development allocations (housing, mixed use and commercial) are realised in line with forecast trajectories or faster than forecast.	Number of residential and commercial developments completed within Bromsgrove DC area - measured using Bromsgrove District and Redditch Borough Councils' Planning Department data on full planning applications granted and housing and commercial floor space completions, compared to the baseline set out in the Local Plans.
Reduce congestion and transport costs.	Reduced queue lengths and delays on the A38 corridor.	Queue lengths at key junctions along the A38 corridor - measured using queue surveys and Automated Traffic Counts (ATC) surveys
Maximise the efficiency of the road network.	Faster journey times on the A38 corridor, from the LRN (Local Road Network) onto the A38 corridor and from the A38 corridor onto the SRN at M42 J1 and M5 J4.	Journey times along the A38 corridor through Bromsgrove - measured through journey time surveys.
Increased journey time reliability.	Reduced variability in journey times along the A38 corridor.	Variability of journey times along the A38 corridor through Bromsgrove - measured through journey time surveys.
Improve connectivity for pedestrians and cyclists on and across the A38 corridor, including to the rail station.	More users walking and cycling on and across the A38 corridor and on adjacent local routes. More users walking and cycling to the recently improved Bromsgrove Rail Station. Improved safety for pedestrians and cyclists along the A38 corridor and on adjacent routes.	Number of pedestrians and cyclists along the A38 corridor through Bromsgrove and adjacent routes, including Bromsgrove train station - measured using pedestrian and cycle counts.

The Monitoring and Evaluation and Benefits Realisation Plan appended to the Management Dimension (Appendix M. 6) includes more details on how to monitor the impacts of the A38 BREP Phase 3. The plan links the projected benefits, impacts, objectives and monitoring of impacts through a logic map which identifies how inputs, outputs, outcomes and impacts are interlinked within the proposed scheme. Figure 3.70 presents the updated logic map that captures the changes made to the scheme after the OBC submission.

Figure 3.70 - Logic map of the A38 BREP scheme



Overall, and as reported in more details in the Economic Dimension, the A38 BREP Phase 3 is anticipated to have a beneficial impact on transport users and the surrounding area through meeting the scheme objectives. The scheme will:

- Reduce congestion and transport costs.
- Maximise the efficiency of the road network.
- Increased journey time reliability.
- Support the delivery of housing and employment growth as outlined in the Bromsgrove District Plan and the Redditch Local Plan.
- Improve connectivity for pedestrians and cyclists on and across the A38 corridor, including to Bromsgrove Rail Station.

The expected scheme outputs are summarised in Table 3.45 for highway schemes and Table 3.46 for active mode schemes alongside the quantified outcomes. The assessment methodology is presented in detail in the Economic Chapter of the FBC and is based on updated traffic modelling reflecting Phase 3 schemes (presented in the Traffic Modelling Chapter), an opening year of 2025, future assessment year of 2040, a Do Minimum and Do Something scenarios comparison and The DfT's Active Mode Appraisal Toolkit (AMAT), following relevant criteria in DMRB, TAG guidelines and latest TAG datebooks.

Table 3.45 – Assessment summary of Phase 3 highway schemes outputs

Outcome (short-term)	Outcome (medium / long-term)	Assessment Summary
Decreased congestion on junctions along A38 through Bromsgrove area	Carbon impacts* Impact to local greenhouse gas emissions (GHG)	-£7,210k (GHG over a 60-year appraisal period), and -£68k during construction and maintenance. Whilst the proposed scheme is expected to relieve congestion in some locations, and therefore reduce GHG emissions in these areas, the proposed scheme is anticipated to result in an increase in vehicle kilometres travelled on the network and therefore a resultant increase in Greenhouse Gas emissions. In the Scheme Opening Year the GHG emissions are anticipated to rise by 0.3%, which is therefore considered to be negligible. The 0.3% increase in GHG emission (Opening Year) is compared to an increase of 0.4% in vehicle kilometres travelled, demonstrating that the scheme represents a betterment to GHG emission per kilometre travelled.
	Noise and air pollution impacts Improvements in public health	-£888k (Air Quality over a 60-year appraisal period). Whilst the scheme is estimated to result in an overall increase in emissions of air pollutants, reductions in emissions are expected to occur in some areas (e.g. at approaches to junctions as a result of reduced congestion). Furthermore, a detailed air quality assessment undertaken to support this business case indicates there would be no exceedances of relevant air quality objectives at any modelled human health receptors in the opening year, either with or without the proposed scheme. The assessment also indicates that the proposed scheme is unlikely to have a significant effect on national compliance with the annual mean NO2 air quality Limit Value. As such, and in accordance with DMRB LA 105, the air quality impacts of the proposed scheme are considered to be not significant. -£4,629k (Noise over a 60-year appraisal period). Of the 140 non-residential sensitive receptors assessed in the short term, 9 are expected to experience an adverse impact of minor magnitude or greater, whilst 3 are expected to experience a beneficial impact of minor magnitude or greater. In the long term, there are 0 expected to experience an adverse impact of minor magnitude or greater and 1 expected to experience a beneficial impact of minor magnitude or greater.

Outcome (short-term)	Outcome (medium / long-term)	Assessment Summary
Improved journey times along the A38	Reduced commute time More time to spend on recreational activities	Total user benefit of £50,094k. The scheme is anticipated to have a positive impact to journey times. User benefits include £48,257k of travel time benefits (including bus users) and £2,199k VOC benefits.
	Travel time savings for business users and transport users	As detailed in the Chapter 4 (Traffic Modelling), the scheme results in savings of up to 2.1 minutes in the peak hours with the AM peak hour showing greater savings than the PM peak (up to 1.0 minute).
	Cost reductions for transport allowing businesses to operate more efficiently	
Improved accessibility	Facilitates the delivery of local plan allocations	No qualitative assessment. Given that four proximate development sites are required to make a Section 106 contribution to scheme delivery, a clear planning link between the proposed intervention and key development sites exists.
	Easier journey means a greater number of people will be willing to travel to / from this area Businesses have access to a wider range of workers and skills	Improving journey time along the A38 results in solutions to market failures in non-transport markets. This appraisal has considered improvements due to output in imperfectly competitive markets, labour market access to employment opportunities, and increased agglomeration. Wider economics benefits are estimated at £15,864k.
	Better access from Bromsgrove to West Midlands major employment areas Businesses have access to a wider range of workers and skills	

** Only transport user carbon is reported here and in the Economic Dimension, construction carbon is presented in the Carbon Management plan (Appendix M.7 of the Management Dimension).*

Table 3.46 – Assessment summary of Phase 3 active mode schemes outputs

Outcome (short-term)	Outcome (medium / long-term)	Assessment Summary
Removal of potential conflicts between pedestrians and cyclists (short-term)	Enhancements for pedestrians and cyclists can promote a long-term shift to active modes	£19,479k - Monetised AMAT benefit based on increased physical activity levels. Active mode schemes and enhancement included in the highway schemes are expected to generate an estimated 2,000 additional walking and cycling trips on an average weekday.
Increased in the number of pedestrians		

Additional impacts that are anticipated but are not included in the two tables above include:

- Construction and maintenance impacts (Travel Times and VOC).
- Wider Impacts (Level 2 and 3 (GVA) benefits).
- Journey Time Reliability impacts.
- Accidents (based on COBALT assessment).
- Scheme costs including operation and maintenance costs.

These additional impacts are included within the Value for Money Statement and Appraisal Summary Table (both included in the Economic Dimension); together demonstrating that the A38 BREP Phase 3 scheme has an overall positive impact and is a strong value for money proposition.

The scheme supports the delivery of 5310 homes and 13.45 Hectares of employment land based on the current plan. Subject to the ongoing Local Plan review, the scheme may further support delivery of additional homes and employment land. Section 5.6.1.8 of the Economic Dimension demonstrates that some 1,130 gross Full Time Equivalent (FTE) jobs and more than £58m in Gross Value Added (GVA) per annum could be realised at sites that the proposed A38 BREP Phase 3 will support.

The assessment work presented in the Economic Dimension shows that the A38 BREP Phase 3 is supported by a robust case for change. The A38 BREP Phase 3 is supported by a robust case for change. The scheme's (Phase 3) initial Level 1 Benefit Cost Ratio (BCR) (Transport user benefits) is estimated at 2.31 demonstrating that the scheme provides a 'High VfM' (between 2 and 4) to taxpayers. The Present Value of Benefits (PVB) equates to £66.04M compared against the Present Value of Costs (PVC) of £28.59M. Low and high growth sensitivity tests have been undertaken. The low growth test demonstrated a BCR of 1.78 implying a medium value for money whilst the high growth scenario demonstrated a BCR of 2.80 implying a high value for money.

With the inclusion of the wider economic benefits (Level 2 BCR, that includes induced investment, employment effects and productivity impacts) Phase 3 schemes demonstrate an adjusted BCR of 2.86 which implies a High VfM. The corresponding Level 2 BCR figures for the low and high growth sensitivity tests are 2.21 and 3.46 respectively, implying High VfM for both tests.

Analysis of the combined Phase 2 schemes (Schemes 2a, 2b and 4, also called early delivery schemes) and Phase 3 schemes has also been undertaken. As a standalone package, Phase 2 schemes offered a High VfM (with a BCR of 2.9) to taxpayers. When combined with Phase 3 schemes, a High VfM to taxpayers is anticipated with a BCR estimated at 2.35.

3.4.4 Key Stakeholders Views and Requirements

Consultation on the principle of the A38 BREP package has previously been undertaken indirectly, via the Worcestershire LTP4. Consultation versions of the LTP included information on the A38 BREP which means that they have been subject to various high-level consultations as part of both LTP3 and LTP4 and endorsed by the County Council's Cabinet. References were made regarding the need for enhancements to the A38 in the Bromsgrove District and Redditch Borough Local Plans, demonstrating that general awareness have been raised to the importance of the enhancements through the consultation and discussion of the Local Plans process leading up to the adoption of the plans in 2017.

Overall, A38 BREP Phase 3 schemes have a good level of stakeholder support as demonstrated in the following points:

- National Highways contributed funding for Phase 1 via their Growth and Housing Fund (GHF) initiative. Engagement with NH has been particularly important as part of the business case development. Therefore, WCC has been engaging with NH since the submission of the A38 BREP SOC; and have been incorporating their comments appropriately. The Management Dimension section 8.9.3 provides full details of the process of engagement with NH. A letter reconfirming the support of National Highways for the FBC is included in Appendix S.5.
- Midlands Connect have ranked it in their top three schemes within the region, through the Regional Evidence Base. A letter of support for the OBC and an updated letter for the FBC reconfirming the support are included in Appendix S.5.
- WLEP and the Worcestershire Local Transport Board (including Councillors), who previously approved an OBC for the corridor and allocated £7.5m of Local Growth Fund to the A38 corridor (this has funded Phase 1 works, the construction of the A38 BREP Phase 2 early delivery Schemes 2a, 2b and 4) and the development of different stages of this MRN business case). A letter of support from both WLEP and Herefordshire and Worcestershire Chamber of Commerce was provided for the OBC. This letter was signed by 25 local businesses demonstrating the wider support the scheme enjoys. In addition to that, letters from developers were also received and are included in Appendix S.5. An updated letter reconfirming WLEP's support of the FBC is also included in Appendix S.5.
- GBSLEP have approved previous stages of the business case process and awarded funding for Phase 1. A letter confirming GBSLEP's support is included in Appendix S.5.
- Homes England, who gave their support via the Housing Infrastructure Fund (HIF) process in 2017.
- WCC Councillors approved the overall concept of the (previously developed) scheme for the A38 in July 2018 (as the scheme stood at that time) at a meeting of the full Cabinet and supported implementation of Phase 1. WCC Councillors have been further involved in the development of the scheme during the OBC stage, via meetings and briefing sessions. The scheme which broadly forms the basis of the OBC submission was presented to Cabinet on 22nd October 2020 and received endorsement.

  Due to higher inflation experienced in 2022, resulting in increased scheme cost, the scheme has been phased into Phase 3 and Phase 4. This approach has been endorsed by the Project Board and the Cabinet on 8th December 2022 who also endorsed the submission on the FBC. The approach was also communicated to the DfT in November 2022.
- The MP for Bromsgrove provided letters of support for the SOC and OBC (Appendix S.5) and has reconfirmed his support of the FBC as presented in Appendix S.5.

A public engagement exercise was undertaken in February and March 2020 to gather views from members of the public. Overall, the purpose of the scheme was well supported.

A further public engagement exercise was undertaken in early 2021 to specifically provide information on and discuss Schemes 1 and 6 as these were identified following the initial 2020 engagement feedback and therefore had not been included in the previous exercise. Local walking and cycling groups were also invited to comment on these schemes.

A pre-planning separate engagement exercise was undertaken during July and August 2021 to share proposals for the footbridges, Schemes 3 and 5. The original OBC stage Scheme 3

proposal involved the construction of new pedestrian/cycle bridge across the A38 from Harvington Road to Old Station Road. In order to ensure compliance with LTN 1/20 standards, the bridge design included large access ramps compared to those envisaged at SOC Stage, resulting in wider environmental and local concerns, in addition to impacts on the value for money.

A further public engagement exercise was undertaken in summer 2022 to specifically provide information on and to discuss the replacement of the walking/cycling bridge from Harvington Road to Old Station Road (notated as Scheme 3 in the OBC submission) with the new Scheme 3 (providing an active travel corridor enhancements between the Bromsgrove Town Centre and Bromsgrove Rail Station) and the introduction of a new active mode corridor improvement Scheme 9.

Following the OBC submission, an LTN 1/20 compliance assessment was undertaken which highlighted the need for traffic calming measures along the corridor which were not previously envisaged. Therefore, Scheme 9 has been introduced and includes the installation of LTN 1/20 compliant traffic calming measures to reduce the speed of vehicles and improve attractiveness for active modes. It runs parallel to the A38 from Stratford Road connecting to the recently built off road active travel corridor on Harvington Road.

In Summer 2022, an engagement exercise has been carried out to specifically provide information on and discuss the new Scheme 9 and Scheme 3 as pedestrian and cycling improvements' alternatives to the OBC stage Scheme 3. This exercise used a variety of engagement methods to promote and encourage participation including letter distribution to local residents, a press release in the local media to promote the engagement exercise, resulting in the following articles being published in the local press, and publishing in the project website. Feedback was also collated through emails, receiving a total of 100 responses. Positive feedback was received, highlighting WCC's commitment to the promotion of active travel. Appendix M.4 provides further details of main themes raised during this engagement exercise and WCC responses.

A communications plan was developed as part of earlier work and has been updated to support this bid. This has been refreshed for the FBC and sets out the current views of stakeholders and the strategy for continued engagement. The Stakeholder Management & Communication Plan, included as Appendix M.4, provides further details on these engagement activities.

3.4.5 Options

3.4.5.1 Introduction to Optioneering, Assessment and Sifting

The schemes identified above tackle congestion at junctions, as well as problem locations for pedestrians and cyclists.

As part of the development of the SOC a high-level OAR was prepared. This document was updated to accompany the OBC submission as Appendix S.1. It describes the work undertaken to generate, appraise, develop and sift potential options.

An addendum is appended to this FBC submission as an update to the OAR (Appendix S. 7), and paragraph 0 is inserted, reflecting further development and assessment of options after the OBC submission (changes to the scheme are presented in section 3.1.3.2).

3.4.5.2 Long List of Potential Strategic Options

The DfT Early Assessment and Sifting Tool (EAST) is a defined step in the appraisal process set out in TAG. Prior to the more detailed appraisal, the EAST tool allows a comparative analysis of options at early stages of development or different stages of development. As the tool has been used at an early stage in the development of scheme interventions for this business case, high-level information in respect of problems, impacts and constraints is drawn from the evidence developed for the corridor. The following paragraphs provide a background on the long list of options assessed using the EAST.

3.4.5.2.1 Previous Studies

The potential upgrade of the A38 corridor on its existing alignment has a long history of evaluation work to identify appropriate solutions for the corridor. Previous work undertaken by WCC that commenced during 2012, had discounted the off-line bypass option as not being deliverable, and as such WCC reached a decision to pursue a corridor approach. The decision took into account a number of factors and reflected the findings of a 2012 and 2016 assessment. In summary, WCC corridor approach was influenced by the studies explained in the OAR and summarised in Table 3.47.

Table 3.47 – Previous studies

Name of the study	Recommendation
The Bromsgrove Transport Package (2012)	This study reviewed the problems and issues across Bromsgrove and recommended that a corridor enhancement scheme to enhance the existing A38 should be taken forward through LTP3 and through the Infrastructure Development Plan/District Plans review process.
Bromsgrove District Plan (2015)	This study concluded that the required development could be accommodated on the existing network subject to a series of improvements, in particular to key junctions along the A38. This conclusion was reflected in the Infrastructure Delivery Plan prepared to support the District Plan review in 2014. The Bromsgrove District Plan, adopted in 2017, and the Infrastructure Delivery Plan which supports it, focused on enhancements to the A38 corridor.
JMP review of the feasibility of a Western Bypass for Bromsgrove (2015)	This study assessed the land-use planning background, made a consideration of potential route options and assessed the costs and delivery issues involved. This concluded that the justification for investment in a western distributor road was uncertain.
LTP 4 (2017)	Drawing on the findings of earlier work, focused on making best use of the existing A38 corridor in line with Government policy. Current LTP policy therefore promotes a corridor approach.

3.4.5.2.2 Long List of Options Assessment

A review of the available evidence was undertaken including a review of a potential western bypass alignment via the EAST assessment method as part of an evaluation for the purpose of this business case, and in line with the A38 BREP objectives and wider policies.

At a strategic level there are seven clear options for improving the A38 corridor, based upon information considered from a review of policy, and also evaluation of the A38 corridor. These strategic options are:

- Active Mode Improvements to A38 corridor.
- Small scale public transport infrastructure improvements (Such as RTI, signal control improvements).
- New public transport network (full network upgrade).
- Upgrade the existing A38 junctions at grade.
- Upgrade the existing A38 junctions with grade separated junctions.
- Upgrade A38 to dual carriageway.
- Build new highway alignment on west side of Bromsgrove (Western Bypass).

Each of these strategic options has then been evaluated using EAST methodology at a high level, to identify the strategic direction for the business case. While the details of this assessment are documented in the OAR (Appendix S.1), Table 3.48 presents a summary of the results of the EAST assessment.

Table 3.48 - Summary of the results of the EAST assessment (Red=Fail, Green=Pass)

Option	Strategic Dim.	Management Dim.	Economic Dim. (Economy)	Economic Dim. (Environment)	Financial Dim.	Commercial Dim.	Taken Forward	Remarks
Option 1 -Do Nothing	Fail	Pass	Fail	Pass	Pass	Pass	No	This option fails to pass the strategic dimension as it does not contribute to wider policies, does not meet any of the scheme objectives, and unlikely to have desirable consequences as it will be unlikely to accommodate the local growth consented. It also scores poorly against economic growth as it would not resolve the identified problems which would impede growth.
Option 2 – Active Mode improvements to A38 corridor	Pass	Pass	Pass	Pass	Pass	Pass	Yes	Whilst the option is not anticipated to resolve, in isolation, the current and future issues along the corridor, they have a good fit with the objectives and policies. Incorporating active Mode Improvements with highway interventions is expected to increase the efficiency of the overall enhancements to the A38. It improves incident numbers and accessibility along the A38 corridor. It would also contribute to well-being by reducing severance and increasing physical activity and accessibility. There are potentially some localised improvements to air and noise quality as a result of mode shift instigated by this option.
Option 3 – Small scale PT infrastructure improvements	Pass	Pass	Pass	Pass	Pass	Pass	Yes	Option satisfies all dimensions as it involves small changes to infrastructure, therefore this option is unlikely to impact significantly on the environment, nevertheless have the potential to produce user benefits especially if not implemented in isolation.
Option 4 – New Public Transport network	Fail	Pass	Pass	Pass	Pass	Pass	No	Failed to meet the strategic dimension due to lack of support by wider policy.

Option	Strategic Dim.	Management Dim.	Economic Dim. (Economy)	Economic Dim. (Environment)	Financial Dim.	Commercial Dim.	Taken Forward	Remarks
								This option is expected to result in mode shift from private vehicles to a higher density mode, however, benefits of this shift might be limited due to high car dependency and the widespread nature of the origins and destinations of those travelling along the A38. Infrastructure such as bus lanes or dedicated routes may result in traffic displacement leading disbenefits elsewhere. New Public Transport network (option 4) would decrease journey times and increase resilience and accessibility by providing better services and priority for buses, therefore this has scored 'Green/Amber' for economic growth. This option is expected to improve air and noise quality on the A38 due to mode shift from private vehicles to a higher density mode.
Option 5 – Upgrade existing A38 junctions at grade	Pass	Pass	Pass	Pass	Pass	Pass	Yes	This option is expected to provide a significant increase in capacity at the junctions along the A38, reducing the issues of congestion for minimal level of impacts on the environment and communities. High fit against objectives and wider policy.
Option 6 – Upgrade existing A38 junctions with grade separated junctions	Fail	Pass	Fail	Fail	Fail	Pass	No	Failed to meet the strategic dimension due to low support by wider policy. Failed to meet the economic dimension due to increased costs and impacts. This option would worsen severance between communities, and have major impacts on habitat, air and noise, landscape and streetscape. It would involve considerable land and expected to increase traffic flows on the A38. Failed to meet financial dimension due to low affordability.

Option	Strategic Dim.	Management Dim.	Economic Dim. (Economy)	Economic Dim. (Environment)	Financial Dim.	Commercial Dim.	Taken Forward	Remarks
Option 7 – Upgrade A38 to Dual Carriageway	Fail	Pass	Fail	Fail	Fail	Pass	No	Failed to meet the strategic dimension due to low support by wider policy and does not solve the issues along the A38 corridor. Failed to meet the economic dimension due to increased costs and impacts. This option would worsen severance between communities, and have major impacts on habitat, air and noise, landscape and streetscape. It would involve major land take. Failed to meet financial dimension due to low affordability.
Option 8 – Build new highway alignment on west side of Bromsgrove	Fail	Pass	Fail	Fail	Fail	Pass	No	Failed to meet the strategic and economic dimensions as this option is expected to have high costs for low level of benefits and significant negative impacts to some people and the environment. Lack of support by wider policies. This option could create new severance issues, significant amount of land take which would impacts natural, built environment, including habitat impacts and listed buildings. Some interaction with areas at risk of flooding and a need for any route to cross Battlefield Brook. Also, it is unlikely to totally remove significant congestion from A38 given its distance from Bromsgrove, therefore unlikely to considerably impact air and noise on the A38. Failed to meet financial dimension due to low affordability.

3.4.5.3 Short List of Options

The EAST assessment concluded that a combination of the following strategic options is expected to be the best in easing the A38 corridor identified problems for minimal impacts on the environment and communities:

- Active Mode Improvements to A38 corridor and the wider area.
- Small scale public transport infrastructure improvements (Such as RTI, signal control and shelter improvements); that build on the success of BoD and aim to contribute to the wider DRT that has been launched by WCC recently.
- Upgrade the existing A38 junctions at grade.

As part of the corridor review all sections of the A38 between M5 Junction 4 to the B4084 Worcester Road junction have been considered on a link and junction basis for a combination of highway capacity and active modes options. The corridor has been assessed for Active Mode improvements based upon gaps in the network, and in creating a fuller network within Bromsgrove to enhance the recently developed NPIF funded schemes. While the following paragraphs summarise the process and options generation and assessment, full details could be found in the OAR (Appendix S.1).

3.4.5.3.1 Optioneering Approach

In order to identify the most appropriate design solution at each junction, a corridor review has been undertaken to identify problem locations, followed by a process of junction specific optioneering and sifting, leading to the development of specific design solutions. This process has been undertaken in stages, reflecting the iterative nature of the scheme development.

During the business case development, the following tasks have supported the identification of junction and active modes options:

- Re-evaluation of the full package of measures using the updated OBC stage (PA based) VISUM model taking into account TAG changes from May 2021 to ensure scheme locations on the A38 corridor remain appropriate to be addressed.
- Revised traffic flow projections have been fed back into VISSIM, Linsig and ARCADY models to evaluate operational performance with updated flow matrices from the VISUM Model.
- Enhancing both junction layouts and active mode connectivity based upon identified issues and problems raised through the several public engagement events.
- Further development of the scheme layouts required for each location. This has involved work to refine the engineering design of the junction and links in order to maximise capacity and enhance active mode provision. It has also included further works on geotechnical design, structural design, road safety, Statutory Undertakers Equipment review of impacts, consideration of environmental impact, detailed review of lane and land implications, and refined local junction modelling. For some scheme locations this work has involved the assessment of multiple options in order to identify a preferred option.
- The progression of designs into a detailed design stage.
- The corridor upgrade has been reviewed in the context of LTN 1/20 standards.
- WCC have identified some light touch interventions to take forward into the business case around select vehicle detection and real time information at bus stops to provide appropriate public transport interventions.

The OAR includes full details of the options considered for each location, consideration of a range of alternative design options (including Do Nothing options), and descriptions of the preferred options.

3.4.5.3.2 Corridor and Junction Optioneering

This paragraph sets out the corridor evaluation undertaken to highlight specific corridor intervention requirements and how the schemes have been identified to address the issues along the route following on from the strategic evaluation set out in section 3.4.5.2. A review of the overall junction flows for each of the junctions on the corridor is presented in Table 3.49.

Table 3.49 – Flow Comparison Base vs DM

Junction	Peak	2017 Base	2025 Do Minimum	2040 Do Minimum
Worcester Road	AM		2029	2200
Worcester Road	PM		1899	2274
Hanbury Road	AM	2186	2182	2212
Hanbury Road	PM	1980	1878	1969
Buntsford Drive	AM	1764	1797	1814
Buntsford Drive	PM	1714	1681	1820
Austin Road / Sherwood Road	AM	2551	2462	2567
Austin Road / Sherwood Road	PM	2698	2604	2765
Charford Road	AM	3019	2518	2642
Charford Road	PM	3064	2775	2958
New Road	AM	2643	2183	2256
New Road	PM	2931	2393	2405
A38 / A448	AM	3773	3680	3809
A38 / A448	PM	4149	3866	4141
Slideslow Drive	AM	2191	1866	1858
Slideslow Drive	PM	2543	2162	2130
Birmingham Road	AM	2739	2698	2735
Birmingham Road	PM	3065	3033	3031
M42 J1	AM	3190	3461	3688
M42 J1	PM	3724	4279	4527
Braces Lane / Golden Cross Lane	AM	2708	2633	2756
Braces Lane / Golden Cross Lane	PM	2755	2880	2962
Woodrow Lane	AM	2039	2427	2564
Woodrow Lane	PM	2523	2809	2857
M5 J4	AM	4975	5272	6017
M5 J4	PM	5618	5742	6052

The data above has set out a number of areas that are impacted by the proposed traffic growth within the A38 corridor as a result of development, and general traffic growth within the corridor. It is clear from the data in Table 3.49 that the Do Minimum scenarios are suppressing flows as a result of delays within the A38 corridor, leading to junction turning flows being lower than the 2017 base level.

Discounted junction locations on the A38 route are:

- A38 / Slideslow Drive.
- A38 / M42 Junction 1.
- A38 / Barley Mow Lane.
- A38 / Woodrow Lane.
- A38 / M5 Junction 4.

Locations addressed are:

- A38 / Hanbury Road.
- A38 / Buntsford Drive.
- A38 / Austin Road /Sherwood Road.
- A38 link between Buntsford Drive and Charford Road.
- A38 / Charford Road.
- A38 / New Road.
- A38 / A448.
- A38 / Birmingham Road.
- A38 / M42 Junction 1.
- A38 between Birmingham Road and M42 Junction 1.
- A38 / Golden Cross Lane / Braces Lane.

3.4.5.3.3 Assessment of Highway Interventions

Options for each of the above locations have been assessed with respect to the following:

- Capability to address problems and issues and overall fit with scheme objectives.
- Engineering feasibility.
- Cost of construction.
- Deliverability and land take.
- Environmental impacts.
- Potential impact on traffic conditions.

While the OAR (Appendix S.1) provides full description of current layouts, site specific constraints, issues, current and future traffic data for the options at each of the locations along with justification of the identification of preferred options, Table 3.50 presents a summary of options assessed, with the preferred options highlighted in green.

Table 3.50 - Summary evaluation of highway options (Green=Pass)

Junction	Option	Description	High Level Evaluation
A38 / Hanbury Road	Do Nothing	Retain existing layout and signal timings	Linsig results indicate a worsening of PRC, Delay and Queues without improvement at 2040.
A38 / Hanbury Road	Do Minimum	Optimise signal timings and retain existing layout	Whilst an improvement on the Do-Nothing scenario the junction would still fail to operate within capacity, and thus wouldn't provide sufficient capacity improvements on the A38 corridor.
A38 / Hanbury Road	Option A	Convert junction to four arm roundabout	The A38 flows would heavily dominate the movements at the junction, as there is very little traffic turning into Hanbury Roads from the A38. Significant third-party land would be required to deliver this option, to achieve sufficient entry path curvature.
A38 / Hanbury Road	Option B	Widen Hanbury Road approaches	Significant third-party land would be required to achieve a suitable level of capacity upgrade.
A38 / Hanbury Road	Option C	Widen A38 West arm (Northbound) approach	This would be challenging to deliver due to the proximity of third-party residential land. It would not deliver a whole junction improvement.
A38 / Hanbury Road	Option D	Widen A38 East arm (southbound) to increase left turn lane	Site observations indicate a high proportion of left turn trips are currently stuck in the ahead movements trying to access the business park along this road. A small degree of temporary third-party land would be required for accommodation works.
A38 / Hanbury Road	Option E	Improve pedestrian facilities	An adjacent pedestrian crossing located near to the Avoncroft museum provides for crossing movements between the preparatory school and the residential areas and is in a more direct location than the junction.
A38 / Hanbury Road	Option F	Improve cyclist facilities	The level of cycling in the area is anticipated to be low and are unlikely to be justified.
A38 / Hanbury Road	Option G	Improve bus facilities	No buses are present at this junction
A38 / Buntsford Drive	Do Nothing	Retain existing layout	Appears to be a viable option based upon option results, does not provide for improvements to pedestrian and cycle provision.
A38 / Buntsford Drive	Do Minimum	Reconfigure road markings at roundabout	Appears to be a viable option for capacity, in terms of design, it is not thought that road marking reconfiguration would be possible, without alteration to exit capacity.
A38 / Buntsford Drive	Option A	Signalisation of junction to three arms	The capacity issues at the junction are not sufficient enough to justify signalisation and redesigning the full junction, it is also likely that

Junction	Option	Description	High Level Evaluation
			signals at this location would introduce off peak disbenefits to the network.
A38 / Buntsford Drive	Option B	Alter roundabout to facilitate improved pedestrian and cycle facilities to connect to a new pathway alongside the A38 towards the supermarket.	This would be beneficial to support modal shift from the business park to the station and town centre and nearby residential areas.
A38 / Buntsford Drive	Option C	Improve bus facilities	No buses are present at this junction
A38 / Austin Road /Sherwood Road	Do Nothing	Retain existing layout	If not improvements for active modes are required, then this would be viable.
A38 / Austin Road /Sherwood Road	Do Minimum	Reconfigure road markings at roundabout	Appears to be a viable option for capacity, in terms of design, it is not thought that road marking reconfiguration would be possible, without alteration to exit capacity.
A38 / Austin Road /Sherwood Road	Option A	Signalisation of junction to four arm crossroads, with crossing on all movements	It is likely that the scheme would require significant land take from the retail stores to accommodate a suitably large junction to meet demand.
A38 / Austin Road /Sherwood Road	Option B	Signalisation of roundabout, crossings on one A38 and one minor road	Not viable without significant increase in Inscribed Circle Diameter, due to short circulatory stacking distances that are present.
A38 / Austin Road /Sherwood Road	Option C	Convert junction to through about	Would require upgrade of overall junction to accommodate, in addition the traffic flows on the A38 are similar in volume to those from Sherwood Road.
A38 / Austin Road /Sherwood Road	Option D	Upgrade roundabout with standalone crossings on A38 north and between Morrisons and Lidl.	Appears that this will support the movement pattern of the junction that is forecast, in addition to being deliverable with minimal land take. It will also facilitate the new active mode route along the eastern side of the A38.
A38 / Charford Road	Do Nothing	Retain existing layout	The existing layout would not improve active mode users on Charford Road and Stoke Road and is not in line with current best practice.
A38 / Charford Road	Do Minimum	Optimise Signal Timings	Optimisation of the signal timings for the existing stages, would provide more capacity than Do Nothing, but offers no improvement for active mode users.
A38 / Charford Road	Option A	Convert junction to roundabout	Provision of a roundabout, would require the full replacement of two culverts, realignment of the

Junction	Option	Description	High Level Evaluation
			A38, and third-party land acquisition of commercial premises
A38 / Charford Road	Option B	Widen A38 north and south entries	Widening of the A38 approaches would require improvements to the existing culvert underneath the A38 north approach, which would likely require the A38 carriageway alignment to be raised to provide sufficient clearance under new legislative requirements. Significant third-party land take would also be required.
A38 / Charford Road	Option C	Widen the Charford Road and Stoke Road Entries	This solution improves the operational performance of the junction for traffic but does not improve the situation for active mode users.
A38 / Charford Road	Option D	Widen Charford Road and Stoke Road, with pedestrian/cycle crossing upgrades on all arms.	This option resolves the junction capacity constraint, in addition to facilitating improvements to the active mode crossing provision on all four arms to meet the local demand.
A38 / New Road	Do Nothing	Retain existing layout	Capacity in 2040 becomes an issue, this is anticipated to worsen.
A38 / New Road	Do Minimum	Optimise signal timings	Whilst optimisation of the signal timings provides a degree of improvement, this will still not bring the junction within capacity in 2040.
A38 / New Road	Option A	Convert the junction to a roundabout	The A38 flows would likely mean longer delays on New Road approaches, in addition pedestrian crossing facilities would be worse than at present. Would likely require third party land to deliver.
A38 / New Road	Option B	Additional southbound lane on A38, wider crossing with optimised signal timings	This option would improve the A38 conditions but would not improve conditions for the New Road approaches significantly.
A38 / New Road	Option C	Additional southbound lane on A38, with wider A38 crossing points, new crossings on New Road and optimised signal timings	This option would improve the A38 conditions but would not improve conditions for the New Road approaches significantly. It would also improve New Road crossing provision.
A38 / New Road	Option D	Additional southbound lane, with wider A38 crossing points, new crossings on New Road and two ahead lanes from town centre to Rail Station and optimised signal timings	This option would improve the A38 conditions, some improvements would be made to New Road movements. It would also improve New Road crossing provision.
A38 / A448	Do Nothing	Retain existing layout	Capacity in 2040 becomes an issue, this is anticipated to worsen.

Junction	Option	Description	High Level Evaluation
A38 / A448	Do Minimum	Reconfigure road markings at roundabout	Alterations to road markings will not provide sufficient capacity, or assist in pedestrian crossing improvements
A38 / A448	Option A	Convert junction to through about	There are significant flows on both the A38 and A448 approaches, so a simple through about would struggle to operate within capacity, in addition the current junction layout makes achieving suitable stacking spaces on the circulatory challenging.
A38 / A448	Option B	Convert to signal crossroad junction	This arrangement would be unlikely to work as whilst there are significant ahead movements there are also significant right turn movements, in addition the layout would be complicated further by the Regents Park Road and Golf Course approaches.
A38 / A448	Option C	Grade separation of A38	The grade separation of this junction would impact the visual amenity of the area, in addition significant earthworks would be required to facilitate movement, for similar reasons to Option B, this scheme may not operate in capacity.
A38 / A448	Option D	Signalise A38/A448 approaches with MOVA	Signalising the approaches would be unlikely to resolve the level of capacity issues encountered at this junction. Further it does not improve the active mode users.
A38 / A448	Option E	Signalise A38/A448 approaches with MOVA and widen approaches	Improvements to the approaches in terms of width and signalisation would provide additional capacity at the junction to cater with the forecast level of flows. This option does not improve conditions for active mode users.
A38 / A448	Option F	Signalise A38/A448 approaches with MOVA and widen approaches. Provide signal crossing points on approaches	Improvements to the approaches in terms of width and signalisation would provide additional capacity at the junction to cater with the forecast level of flows. This option would improve conditions for active mode users.
A38 / Birmingham Road	Do Nothing	Retain existing layout	Capacity in 2040 becomes an issue, this is anticipated to worsen. Would not cater for two lane southbound approach
A38 / Birmingham Road	Do Minimum	Optimise Signal Timings	Unlikely that junction would operate with optimised signal timings in 2040
A38 / Birmingham Road	Option A	Upgrade MOVA, extend Right turn lane and introduce pedestrian crossing facilities	Upgrade of the MOVA system will create little additional capacity benefits, extension of the right turn lane is not likely to improve A38 NB and SB queueing

Junction	Option	Description	High Level Evaluation
A38 / Birmingham Road	Option B	Improve junction to accommodate two southbound lanes, and improve pedestrian crossings	Improved pedestrian crossings to access and link Birmingham Road to School Lane are important to reduce the level of cross over traffic in this direction. In addition, two lanes southbound from M42 J1 would likely resolve the queuing that occurs at M42 Junction 1, as there would be a longer section to merge over within.
A38 / M42 Junction 1	Do Nothing	Retain existing layout	Capacity in 2017 on the exit to A38 south is already a capacity constraint, this will worsen by 2040 with queues expected to increase on the M42 off slip.
A38 / M42 Junction 1	Do Minimum	Revise signal timings	Revisions to the signal timings will provide some ability to manage the impact of queues on the M42 off slip, however this would be at the detriment to the A38 approaches.
A38 / M42 Junction 1	Option A	Improvements to A38 South to two full lanes towards Birmingham Road junction	This would provide a step change in capacity at the junction, as traffic would be unlikely to block back into the junction.
A38 / M42 Junction 1	Option B	Improvements to A38 South to two full lanes towards Birmingham Road junction, and revised signal timings. Right turn in ban to School Lane	As per option A this would provide a step change in capacity at the junction, with the revised signal timings providing extra capacity as the timings would be optimised to maximise the improved exit capacity. Removal of the right turn into School Lane, would ensure that northbound traffic is not delayed in the section between Birmingham Road and M42 J1.
A38 / M42 Junction 1	Option C	Improvements to A38 South to two full lanes towards Birmingham Road junction, and revised signal timings. School Lane fully closed.	The proposal would be beneficial to the capacity at the M42 J1 as there would be limited risk of the A38 being slowed down from vehicles egressing from School Lane. However, on balance it may lead to traffic rerouting onto less suitable routes than the Alcester Road and A38.
A38 / Golden Cross Lane / Braces Lane	Do Nothing	Retain existing layout	The current layout would fail to cope with forecast 2040 traffic levels, and would result in long queues and delays, in addition there is no improvement to pedestrian crossings.
/ Braces Lane	Do Minimum	Optimise signals	Optimisation of the current signals would likely provide some additional capacity however it should be noted that the optimisation would not provide any improvement for pedestrians.
/ Braces Lane	Option A	Convert junction to a roundabout	It is not thought that the flows at the junction would lead to a balanced operation of the junction given the dominance of the A38 north to south movement. In addition, the location of the bridge and petrol filling station would likely lead to design challenges to meet entry path curvature requirements.

Junction	Option	Description	High Level Evaluation
/ Braces Lane	Option B	Widen Golden Cross Lane approach	Widening of the Golden Cross Lane approach would be unlikely to improve the capacity problems at the junction.
/ Braces Lane	Option C	Widen the A38 Southbound approach	Improving the A38 southbound approach would provide an improvement in overall junction capacity.
/ Braces Lane	Option D	Extend A38 northbound approach lane and widen A38 Southbound exit for two ahead lanes.	This is effectively a combination of Options B and C, and thus would be likely to provide an uplift in capacity at the junction.
/ Braces Lane	Option E	As Option D plus pedestrian crossing on south arm and increase stagger of A38 north pedestrian crossing.	As option D, but with enhanced pedestrian crossing facilities.

The preferred option for each of the locations were then bought forward to be included in the business case submission for the corridor evaluation and impacts calculations.

3.4.5.3.4 Active Modes Optioneering and Assessment

This paragraph is a brief of chapter 18 of Appendix S.1 (the OAR) which documents the need for improvements to the Active Mode provision along the A38 corridor. Options generation, assessment and sifting have been carried out in the following stages:

- Gap analyses of active mode provision.
- Revision of WCC active mode vision.
- Long list of options assessment and sifting (included 15 options).

The result of this assessment is presented in Table 3.51.

Table 3.51 – Summary evaluation of active mode improvements (Green=Pass)

Option Location	Sub Option	High Level Evaluation
Option 1 – Upgrade of existing footpaths to dual use, active travel corridor along the A38 from Buntsford Business Park to Harvington Road.	Route on east of A38	Site conditions on this area limit the ability north of the Charford Road junction to deliver a full route to the east.
Option 1 – Upgrade of existing footpaths to dual use, active travel corridor along the A38 from Buntsford Business Park to Harvington Road.	Route on west of A38	Conversion of the western side is constrained by third party land requirement from Charford Primary School, in addition to the connection from Buntsford Business Park to the western side of the route requiring a crossing point at the Buntsford Drive junction.
Option 1 – Upgrade of existing footpaths to dual use, active travel corridor along the A38 from Buntsford Business Park to Harvington Road.	Route on both sides of A38	Site constraints limits the ability to provide a shared or segregated route on both sides of the A38, in particular in the section between Buntsford Drive and Austin Road junctions
Option 1 – Upgrade of existing footpaths to dual use, active travel corridor along the A38 from Buntsford Business Park to Harvington Road.	Route switches between sides	Provision of a continuous route that switches between east and west of the A38 highway corridor, provides a route that whilst not completely free flowing, would provide a significant upgrade from current level provision, that would provide a suitable upgrade.
Option 2 – Replacement of the existing walking bridge over A38 (Fordhouse Road to Carnforth Road) to dual use (walking and cycling) – this forms part of NCN5.	Do Nothing	Whilst this is an option, if the aim of the A38 BREP scheme is to deliver an increase in cycling and walking, then the width of the bridge is unlikely to support an increase due to the potential for conflicts between pedestrians and cyclists. In addition to the mix of user types comprising a large proportion of school children accessing the school located adjacent to the bridge.
Option 2 – Replacement of the existing walking bridge over A38 (Fordhouse Road to Carnforth Road) to dual use (walking and cycling) – this forms part of NCN5	Improve existing bridge	The feasibility of improving the existing bridge would likely have resulted in a requirement to close the structure for a large period of time, in addition the age of the bridge and structure makes this technically challenging.
Option 2 – Replacement of the existing walking bridge over A38 (Fordhouse Road to Carnforth Road) to dual use (walking and cycling) – this forms part of NCN5	Replace bridge with new structure and ramps	Provision of a new bridge structure will provide a wider structure with parapet heights suitable for those required for the bridge to be a cycle route. In addition, a shorter construction period would be anticipated, and a shorter closure should be required.

Option Location	Sub Option	High Level Evaluation
Option 3 – Provision of new active travel bridge from Harvington Road (Old Station Road) to Old Station Road ('east'), to form new waymarked 'quiet link' for active travel modes between Town Centre and Rail Station.	Close existing uncontrolled crossing and divert pedestrians and cyclists to New Road junction	Closure of the existing crossing would be undesirable due to the recently completed NPIF route linking to these locations, in addition a detour to the New Road crossing would add significant journey length for walking and cycling journeys.
Option 3 – Provision of new active travel bridge from Harvington Road (Old Station Road) to Old Station Road ('east'), to form new waymarked 'quiet link' for active travel modes between Town Centre and Rail Station.	Replace uncontrolled crossing with at grade Toucan Crossing	Provision of an at grade crossing at this location would likely result in significant delays to the A38 corridor, in addition to impacting on the ability to merge two traffic lanes south of New Road, resulting in queuing issues not being addressed.
Option 3 – Provision of new active travel bridge from Harvington Road (Old Station Road) to Old Station Road ('east'), to form new waymarked 'quiet link' for active travel modes between Town Centre and Rail Station.	Replace existing uncontrolled crossing with subway	This is not likely to be feasible due to the utilities on the east, west and under carriageway in this location.
Option 3 – Provision of new active travel bridge from Harvington Road (Old Station Road) to Old Station Road ('east'), to form new waymarked 'quiet link' for active travel modes between Town Centre and Rail Station.	Replace existing uncontrolled crossing with cycle/pedestrian bridge	Provision of a new bridge at this location would enhance all mode movement at this location, and remove deterrent to crossing at this existing uncontrolled location.
Option 4 – New signal-controlled crossing on Stratford Road (A448) in the vicinity of Blackwood Road; (provides continuous, high quality, parallel alternative route to A38 between Police Campus, HOW College and Station).	Provide crossing point to the east of Fordhouse Road	Provision of a crossing to the east, would enable improved linkages between a wider strategy to link the A38 North to South Route, with the college, and Regents Park Road area.
Option 4 – New signal-controlled crossing on Stratford Road (A448) in the vicinity of Blackwood Road; (provides continuous, high quality, parallel alternative route to A38 between Police Campus, HOW College and Station).	Provide crossing point between Blackwood Road and Fordhouse Road	A crossing at this location would present the most direct walking and cycling route between Fordhouse Road and Blackwood Road but would be difficult to deliver between the junctions.
Option 4 – New signal-controlled crossing on Stratford Road (A448) in the vicinity of Blackwood Road; (provides continuous, high quality, parallel alternative route to A38 between Police Campus, HOW College and Station).	Provide crossing point to the west of Blackwood Road	Provision of a crossing on this side might have implications on forward visibility

Option Location	Sub Option	High Level Evaluation
Option 6 – JUNCTION 9 – Toucan crossing and shared use path to link Charford Estate with Sherwood Road, Buntsford Business Park and Station.	Provide bridge over A38 at Charford Road	Consideration is given to a bridge at this location, however site constraints make bridge landing points a challenge to provide, in addition, the multiple directions of movement do not lend itself to a single location bridge, as movements at this location are multi directional.
Option 6 – JUNCTION 9 – Toucan crossing and shared use path to link Charford Estate with Sherwood Road, Buntsford Business Park and Station.	Provide at grade crossing improvements at A38/Charford Road junction	The existing crossings are narrow for the level of pedestrians using, in addition there are no existing north to south crossing points.
Option 6 – JUNCTION 9 – Toucan crossing and shared use path to link Charford Estate with Sherwood Road, Buntsford Business Park and Station.	Provide crossing of A38 between Charford Road and Austin Road junctions	The provision of a crossing point away from the junctions at this section, is unlikely to have much demand, as the majority of the crossing movements are at the junctions, and there are few origins and destinations within the middle of the link that would generate significant trips.
Option 6 – JUNCTION 9 – Toucan crossing and shared use path to link Charford Estate with Sherwood Road, Buntsford Business Park and Station.	Provide crossing at Austin Road junction	Provision of an additional formal crossing would be beneficial to a degree and should be considered as part of junction upgrades at this location. The main pedestrian route would be in the section between Buntsford Drive and Austin Road junctions, in the vicinity of the Morrisons access point.
Option 7 – New active travel link between Buntsford Business Park and Morrisons (Sherwood Road).	Provide route along existing Public Right of Way, parallel to A38	Route is currently unsuitable to be used as a cycle route and would require extensive regrading to meet design requirements either resulting in numerous switchbacks or significant land take.
Option 7 – New active travel link between Buntsford Business Park and Morrisons (Sherwood Road)	Improve existing footway alongside A38 to dual use	The existing footway adjacent to the A38 can be widened to accommodate dual shared use, with minimal land take requirement. So is suitable for conversation to a shared footway for low level usage by pedestrians and cyclists, it is not anticipated that pedestrian or cyclist flows would be more than 300 per hour.
Option 12 – Improvement to crossing provision at all junctions, in both north to south and east to west directions.	No enhancement to crossing provision at A38 junctions	LTN 1/20 requires improvements to the continuity of walking and cycling routes, guidance and policy prior to LTN 1/20 required that walking and cycling measures was high on the modal priority. So it is not appropriate to not enhance walking and cycling infrastructure as part of the highway improvements.

Option Location	Sub Option	High Level Evaluation
Option 12 – Improvement to crossing provision at all junctions, in both north to south and east to west directions.	Improvements as defined at the SOC stage.	Limited improvements were made at key locations, including, Buntsford Drive, Austin Road/Sherwood Road junction, Charford Road, New Road, Golden Cross Lane. These improvements addressed known issues at the locations to facilitate improved crossings but were undertaken in a piecemeal way without providing a full continuous route, or improved connections to the wider residential areas.
Option 12 – Improvement to crossing provision at all junctions, in both north to south and east to west directions.	Improvements to crossing provision in accordance with LTN 1/20 principles	A review of the scheme from end to end in light of pedestrian and cyclist counts undertaken in February 2020, Public Engagement feedback, and LTN 1/20 publication, has led to a review of the corridor, to provide enhancement over those proposed at SOC stage, such that a full north south route is provided along the majority of the A38 section between Lickey End and Buntsford Business Park. This provides connections to key destinations including HOW College, South Bromsgrove High School, Buntsford Business Park. It also provides interconnectivity between the NPIF Radial routes, thus providing an enhanced walking and cycling network, to minimise journey times within Bromsgrove.
Option 13 – Introduction of a walking/cycling Route between A448 Stratford Road and Birmingham Road junctions.	Provide new footway to connect locations	Provision of only a footway whilst feasible, would not enhance the conditions for cyclists, who would be either deterred from making the journey or would need to use the A38 corridor.
Option 13 – Introduction of a walking/cycling Route between A448 Stratford Road and Birmingham Road junctions.	Provide new cycle path off road	Provision of a new off-road path, would enhance conditions for cyclist, but would not improve conditions for pedestrians.
Option 13 – Introduction of a walking/cycling Route between A448 Stratford Road and Birmingham Road junctions.	Provide shared use foot/cycle way	Providing a shared use foot/cycle way would improve conditions for both pedestrians and cyclists, however the provision of a shared foot/cycle way would not future proof the scheme and given that there is a high degree of highway land a segregated facility would be better.
Option 13 – Introduction of a walking/cycling Route between A448 Stratford Road and Birmingham Road junctions.	Provide segregated foot / cycle way	A segregated off-road cycle route would be considered to be the best option in this area as it would future proof improvements to walking/cycling

Option Location	Sub Option	High Level Evaluation
		conditions, should there be a significant uplift in usage, beyond that forecast.
Option 14 – Provision of improved walking and cycling connectivity between the existing active mode infrastructure in the Regents Park Road area and the west of the A38/A448 junction.	Provide on road provision with light segregation features	There would be an option to combine a widening of the carriageway to provide a two-way cycle path using light segregation. However, the challenges of this option are in relation to the junctions on the route, meaning that there would be a risk to the safety of the cyclists, in addition to access to and from the route to make this continuous.
Option 14 – Provision of improved walking and cycling connectivity between the existing active mode infrastructure in the Regents Park Road area and the west of the A38/A448 junction.	Provide off road facility for walking/cycling	An improved option would see a designated shared walking/cycling path provided from the A38/A448 junction to the existing infrastructure located within the Regents Park Road housing estate.
Option 15 – Enhancements to footway between School Lane and Birmingham Road to improve active mode access to Lickey End school.	Improve eastern side of A38	Improvements on the eastern side would be possible with a wider path possible in the southern half of the section than the minimum, due to the third-party land boundary being set back further than the western side. This side is also more on the desire line to the school in School Lane, from Birmingham Road.
Option 15 – Enhancements to footway between School Lane and Birmingham Road to improve active mode access to Lickey End school.	Improve western side of A38	Improvements on the western side of the A38 in this section, would require an additional pedestrian crossing in the vicinity of School Lane, in addition there are a number of service roads in this area which would reduce the continuity of the route.

3.4.5.4 Further Scheme Development After the OBC submission

Following the submission of the OBC (November 2021) work has progressed with scheme development. Sections 3.1.2 and 3.1.3.2 present in details the changes to the scheme after the OBC submission. This paragraph describes further options development and assessment carried out in 2022.

3.4.5.4.1 Changes to the Scheme Components

The key changes to the scheme elements since the OBC stage submission are summarised below:

- The replacement of the OBC stage walking/cycling bridge (Scheme 3) from Harvington Road to Old Station Road with the new Scheme 3 active travel corridor enhancements.

  The original Scheme 3 proposal involved the construction of new pedestrian/cycle bridge across the A38 from Harvington Road to Old Station Road, which was originally severed as part of construction of the A38 and served as an important link between Aston Fields and Bromsgrove.

In order to ensure compliance with LTN 1/20 standards, the bridge design included large access ramps compared to those initially envisaged, resulting in wider environmental and local concerns, in addition to impacts on the value for money.

The new Scheme 3 includes active travel enhancements for pedestrians and cyclists via a combination of segregated cycle routes, new shared cycle/footway facilities, existing facilities and on-road cycling. The route follows New Road, Rigby Lane, Drummond Road, the existing shared facility in the Oakalls estate to join Scheme 6, into Scheme E at Oakalls roundabout and then along Stratford Road to the Town Centre.

- The introduction of a new active mode corridor improvement Scheme 9. Following the OBC submission, an LTN 1/20 compliance assessment was undertaken which highlighted the need for traffic calming measures along the corridor which were not previously envisaged. Scheme 9 includes active travel enhancements with on- road cycling proposed along Fordhouse Road, Bant Mill Road and Harvington Road including the installation of LTN 1/20 compliant traffic calming measures and a new toucan crossing on New Road.
- Minor changes to the designs as the designs progressed into a detailed design stage and refinement due to road safety audits.

Options development and assessment of the new Schemes 3 and 9 are presented in Appendix S.7.

3.4.5.4.2 Changes Due to Phasing of the OBC Schemes into Phase 3 (this FBC) and Phase 4

Due to higher inflation experienced in 2022, resulting in increased scheme costs, OBC schemes (in addition to the new Schemes 3 and 9) have been separated into Phase 3 and Phase 4.

Phase 3 includes six hybrid schemes containing highway capacity and active travel improvements, namely Schemes C to F and parts of Schemes A and B (only limited elements of the latter two schemes have been moved to Phase 4), three active mode improvement schemes (Schemes 3, 6 and 9, in addition to Phase 2 early delivery Schemes 2a, 2b and 4, which are already built and form part of Phase 3' Do Minimum scenario) and two local public transport improvement schemes which have not changed compared to the OBC stage.

Phase 4 schemes (three highway improvement Schemes G and the complementary remaining parts of Schemes A and B, and two active mode improvement Schemes 1 and 5) have been removed from all aspects of this bid and will be progressed once alternative funding sources are identified hence will be subject to a separate business case.

In line with the DfT's advice on reworking on the scope of the A38 BREP package, submitted during the preparation of the FBC, WCC and its consultants worked on the A38 BREP phasing. Three separate teams (WCC Core Project Team, WCC Delivery PM and WCC's Consultants) were formed and each scheme within highway and active mode improvement package were qualitatively scored to provide a clear view on how each scheme was performing when compared with each other. A seven-point scale (-3 to +3) was used to assess the impacts/criteria. The following impacts/criteria were assessed:

- Relative Cost to Benefits Ratio.
- Journey time benefits.
- Safety.
- Enhance active travel.
- Third party contributions.
- Land acquisition.

- Deliverability.

Ensuring and highlighting any key risks associated with the schemes including e.g. the DfT's maximum contribution as set out in the Programme Entry approval letter, the scores (See Table 3.52) of the three teams were rationalised and from these a cohesive scheme was developed for Phase 3 and for the subsequent Phase 4. In summary, the scoring helped WCC to identify all the schemes of the A38 BREP package that could potentially be delivered in Phase 3 and those that could potentially be moved to the next phase (Phase 4). As far as the A38 BREP OBC schemes were concerned, the core of the package remained as is for the A38 BREP Phase 3 FBC and therefore WCC believes that the Strategic Dimension of the Phase 3 scheme will remain robust.

Following the endorsement of the two phases from the Project Board, the Cabinet also endorsed the phasing and the submission of FBC on the 8th December 2022 (See Table 3.53).

*Table 3.52 – A38 BREP phasing**

Scheme	Location	Sub Element	sub name	Relative cost to Benefit	Journey time benefits by mode	Safety	Enhance active travel	S106 Contribution	Supporting Economic growth	Land required (max 0)	Deliverability	Total
Phase 3 schemes												
Scheme E	Oakalls roundabout	Junction improvement		3	3	2	3	3	3	0	1	18
Scheme D	New Road	Junction improvement	D1	3	3	1	2	2	3	0	2	16
Scheme C	Charford Road	Junction improvement	C	2	2	2	3	1	3	-1	2	14
Scheme F	M42 J1 to Birmingham Road	Link / Junction improvement		2	3	1	1	0	3	0	2	12
Scheme 7 and 8	New Road - Station to town centre	Public transport corridor	7+8	3	1	1	1	0	2	0	2	10
Scheme A	Hanbury Turn	Re-lining	A1	2	2	0	0	0	2	0	3	9
Scheme 9	Parallel Active Travel Corridor	Bant Mill Road, New Road ped crossing, Fordhouse Road, Harvington Road	9	1	1	2	3	0	1	0	1	9
Scheme B	Bunsford Road to Charford Road	Buntsford Road to Sherwood Road cycle route	B1	1	1	2	3	0	1	0	1	9
Scheme 6	Oakalls roundabout to Oakalls active travel route	Active travel connection		1	1	1	3	0	1	0	2	9
Scheme B	Bunsford Road to Charford Road	Austin Road to Charford Road widening	B4	2	1	2	1	0	2	-1	2	9
Scheme B	Bunsford Road to Charford Road	Austin Road to Charford Road cycle route	B3	2	1	2	3	0	1	-1	1	9

Scheme	Location	Sub Element	sub name	Relative cost to Benefit	Journey time benefits by mode	Safety	Enhance active travel	S106 Contribution	Supporting Economic growth	Land required (max 0)	Deliverability	Total
Scheme 3	Rail Station to Town centre active travel corridor	Eastern section - Rail Station to A38	2e	1	1	2	3	0	1	0	1	9
Scheme 3	Rail Station to Town centre active travel corridor	Western section - A38 to town centre	2w	1	1	2	3	0	1	0	1	9
Phase 4 schemes												
Scheme G	Marlbrook crossroads	Junction improvement		1	1	1	1	1	1	0	2	8
Scheme B	Bunsford Road to Charford Road	Buntsford Road to Austin Road widening	B2	2	2	1	0	0	3	0	0	8
Scheme 1	Birmingham Road to Oakalls roundabout active travel corridor	Northern section	1a	1	0	2	3	0	1	0	1	8
Scheme 1	Birmingham Road to Oakalls roundabout active travel corridor	Southern section	1c	1	0	2	3	0	1	0	1	8
Scheme 1	Birmingham Road to Oakalls roundabout active travel corridor	Northern section bridge	1b	1	0	1	2	0	0	0	1	5
Scheme A	Hanbury Turn	Traffic signals / new streetlights	A2	1	1	0	0	0	1	0	1	4
Scheme 5	Carnforth Road to Fordhouse Road	Replacement ped cycle / bridge		-1	0	0	1	0	0	0	1	1

**Any scheme with score below 9 was moved to Phase 4.*

Table 3.53 – A38 BREP Phase 3 and Phase 4 Schemes

Original OBC Submission Phase 3 Schemes	Proposed Prioritised Phase 3 Schemes for FBC
Sustainable/Active Mode Schemes: • Scheme 1 – A38 / Buntsford Drive to Sherwood Road • Scheme 3 – Harvington Road to Old Station Road Footbridge • Scheme 5 – Fordhouse Road to Carnforth Road Footway/Cycleway Bridge • Scheme 6 – A38 and A448 Roundabout to Regents Park Road **PT Schemes:** • Schemes 7 & 8 – New Road Active Travel Corridor **Highway Schemes:** • Scheme A - A38 / Hanbury Turn • Scheme B – A38 / Bunsford Drive / Stoke Road • Scheme C – A38 / Stoke Road / Charford Road • Scheme D – A38 / New Road • Scheme E – A38 / A448 (Oakalls Roundabout) • Scheme F – A38 / Birmingham Road / M42 J1 • Scheme G – A38 / Golden Cross Lane / Braces Lane	**Sustainable/Active Mode Schemes:** • Scheme 3 Alt – BREP Active Travel Corridor • Scheme 6 – A38 and A448 Roundabout to Regents Park Road • Scheme 9 – Parallel Active Travel Corridor **PT Schemes:** • Schemes 7&8 – New Road Active Travel Corridor **Highway Schemes:** • Scheme A (Scheme A1 - A38 / Hanbury Turn re-lining) • Scheme B (Scheme B1 – A38 / Buntsford Drive to Sherwood Road Cycle Route; Scheme B3 – Austin Road to Charford Road Cycle Route; Scheme B4 - Austin Road to Charford Road widening) • Scheme C – A38 / Stoke Road / Charford Road • Scheme D – A38 / New Road • Scheme E – A38 / A448 (Oakalls Roundabout) • Scheme F – A38 / Birmingham Road / M42 J1
	Proposed Prioritised Phase 4 Schemes
	Sustainable/Active Mode Schemes: • Scheme 1 – A38 / Buntsford Drive to Sherwood Road • Scheme 5 – Fordhouse Road to Carnforth Road Footway/Cycleway Bridge **Highway Schemes:** • Scheme A2 - A38 / Hanbury Turn Traffic signals and new streetlights • Scheme B2 – Buntsford Road to Austin Road widening • Scheme G – A38 / Golden Cross Lane / Braces Lane

3.4.6 Risks

All risks associated with the delivery of the scheme and their proposed mitigations and likelihood are summarised in the Management Dimension and are detailed in Appendix M.5 (Risk Register) and Appendix F.3 (Quantified Risk Assessment). There are no risks of conflict or tension between the investment proposal and the strategic priorities of WCC.

3.4.7 Constraints

There are a number of constraints that have defined the parameters within which the A38 BREP Phase schemes have been developed. In general terms, the effects of constraints have been either eliminated or mitigated through the design, engagement and consenting processes. The aim of design development undertaken to date has been to establish how the scheme objectives can be

achieved in the most efficient and economically advantageous way within the constraints. Table 3.54 presents a summary of the key constraints.

Table 3.54 – Constraints

Constraint	Issue	Mitigation
Availability of funding	Scale of works required cannot be funded by the local authority.	Early and ongoing engagement with DfT and the LEPs. Local contribution has been secured through section 106 and LEP contributions. Due to extreme inflation experienced in 2022, resulting in increased scheme cost, the OBC scheme has been phased into Phases 3 and 4, with Phase 3 elements being the basis of this FBC. This approach has been endorsed by the Project Board and the Cabinet on the 8th December 2022, and has been communicated to DfT.
Planning permission	A Screening Opinion has confirmed (in 2020) that other works do not require EIA and it is anticipated that these can be delivered as Permitted Development (PD).	Ongoing liaison with Planning Authority/ WCC Development Management and with Worcestershire Regulatory Services. An updated Screening Opinion has been sought during the preparation of the FBC based on the updated traffic model output and the latest designs. The Screening Response received in February 2023 has reconfirmed the PD rights as the previous 2020 screening decision. Scheme 5 has been moved to Phase 4 (not part of this FBC), however, a planning permission has been secured.
AQMA/Noise important areas (NIAs)	Parts of the A38 corridor fall within designated AQMAs/NIAs.	There has been ongoing liaison with Worcestershire Regulatory Services and appropriate stakeholders. Air Quality and noise modelling was undertaken and reported in the Screening Request, the environment appraisal report and the Economic Dimension based on the latest designs/flows. The Screening Response received in February 2023 confirmed that air quality considerations, although important, did not trigger EIA. Noise mitigation measures are considered where required.
Ecology/Protected Species	Several schemes have potential ecological impacts.	There has been early liaison with the Ecology Advisor at WCC. Enhancement opportunities have been considered where possible and shared. Ecological mitigations are considered where needed.

Constraint	Issue	Mitigation
Trees Protection Orders (TPOs)	There are trees subject to a TPO within the scheme extents of Schemes A, B and C.	There has been early and ongoing liaison with the Tree Officer at Bromsgrove District Council (BDC) and the Landscape Advisor at WCC (including sharing landscaping plans for replanting). Tree mitigation measures are set out within the Tree Protection Plans and Arboricultural Method Statement appended to the CEMP and will be implemented by the appointed contractors. WCC's commitment to replanting two trees for every one removed as part of the works. This has been considered in the landscape plans (with particular focus on the species type and location).
Works within the flood plain or in close proximity to water courses	Several schemes interact with the flood plain and watercourses. Consents will be required from the Environment Agency/Lead Local Flood Authority by the appointed contractors. Scheme B is affected by an existing sewer flooding issue and parts of the area are within Flood Zone 3 associated with the Sugar Brook.	There has been early and ongoing liaison with the Environment Agency/Lead Local Flood Authority. Drainage Strategies and designs prepared for each scheme include an assessment of flood risk from all sources relevant to the scheme.
Land availability	Areas of third-party land are required to deliver Schemes B, C, 3 and 6.	Land required for Schemes B and C is expected to be secured by agreement with the relevant landowners and negotiations are still underway, however, WCC has proceeded to make "The Worcestershire County Council A38 Bromsgrove Route Enhancement Programme Compulsory Purchase Order 2023". The Order was sealed on 2nd March 2023. In accordance with statutory requirements, Notice of the making of the Order was published in a local newspaper (The Bromsgrove Standard) on 3rd March and 10th March 2023 (refer to section 8.12.4 of the Management Dimension for details). Bromsgrove District Council has agreed to dedicate to WCC the land required for Schemes 3 and 6.
Highway standard	Design development may require some variation to	Apply for departure from standard, where required.

Constraint	Issue	Mitigation
	DMRB standards given site constraints.	Ongoing engagement with WCC as the Highways Authority.
Underground services	Works required will interact with utilities.	Strenuous efforts have been made throughout the design process to identify all statutory undertakers' plant that requires diversions including GPR, drainage surveys etc. The design process has identified utility clashes, and this has been managed through C3 enquires and appropriate mitigation and design iterations to reduce impact on the scheme. Ongoing engagement and close liaison with utility companies will continue to ensure delivery on time and on budget. Utilities costs are included in the Finance Dimension.
Construction phasing	Construction of different elements of the scheme might interact with other schemes construction timeline causing distribution on the road network.	Ongoing engagement with WCC as Highways Authority to minimise the impacts through carefully considered construction phasing of different elements of the scheme and the interaction with other schemes construction timeline, in order to reduce the impact on the A38 and the wider network. WCC has discussed and agreed the construction programmes received from the preferred contractors, however contractors will be obliged to apply for WCC approval (as the Highways Authority) of their traffic management plans prior to the start of construction.
Availability of resources and staff	Lack of resources within WCC or the appointed contractors.	WCC has discussed and agreed the construction programmes received from the preferred contractors. WCC has robust procurement strategy in place which encompasses business continuity requirements within the selection process. Governance and reporting frameworks are in place to provide early warnings of a supplier's inability to continue to undertake its duties. In the event of supplier failure, duties will be redistributed within the existing project team and wider supply chain. WCC has a number of live contracts with suppliers which can be utilised quickly should the need arise, for example through the IETC, Highways Maintenance Service Contract (HMSC) and professional services contract.

Constraint	Issue	Mitigation
		As the programme consists of a number of schemes, rather than a single fixed project, there is flexibility within the construction programme with opportunity to change the delivery approach if such unforeseen circumstances arise. Team structures have been identified both pre and post construction. Each supplier is responsible for managing resource resilience with individual contingency plan's in the event that persons leave the project team.
Willingness of DfT to accept fundamental business change	DfT position in relation to changes of the A38 BREP elements, namely the phasing approach proposed by WCC due to higher inflation and costs experienced in 2022, in addition to the inclusion of the new Schemes 3 and 9.	Ongoing and proactive engagement with DfT and the submission of the Quarterly Monitoring Reports (QMR).
Existing contractual commitments	WCC do not have the resources to build the scheme.	WCC has discussed and agreed the contractual arrangements with the preferred contractors. Governance and reporting frameworks are in place based on robust procurement strategy. Main works tender procurement has resulted in several contractors competing to deliver Schemes A to F, 6 and 8. A preferred contractor is identified. In addition, the IETC term contract will be used to deliver Schemes 3 and 9. WCC has received quotes from the Public Transport Department supply chain for the construction of Schemes 7.

3.4.8 Key Assumptions

All assumptions, calculations and assessments used in traffic, air quality and noise modelling, economic assessment are presented in the relevant two chapters, and all technical work follows relevant criteria including DMRB, TAG guidelines and latest TAG datebooks.

Final preferred contractor costs and delivery programmes agreed by WCC have been reflected in the assessments where relevant (such as inflation calculations, construction start date, opening year, construction phasing and traffic management assumptions).

In summary, all elements of the FBC have been updated to reflect the most up to date information following relevant assessment criteria, methodologies and assumptions.

3.4.9 Conclusion

The assessment and sifting of the strategic options have recommended a combination of active mode improvements, small scale PT improvements (Such as RTI, Signal control improvements) and upgrade the existing A38 junctions at grade. A more detailed assessment has been carried out to identify the locations and options for the junction and active mode improvements as documented in detail in the OAR. Further options assessment is also presented in section 3.4.5.4. The final options included in A38 BREP Phase 3 (this FBC) are presented in Table 3.55.

Table 3.55 - Recommended options – Phases 2 and 3

FBC Ref	Scheme Description	Modes supported	Objectives				
			Reduce congestion and transport costs	Maximise the efficiency of the road network	Increase journey time reliability	Support the delivery of housing and employment growth, as outlined in the adopted Local Plans	Improve connectivity for pedestrians and cyclists on and across the A38 corridor
A	A38 / Hanbury Road	Highway	✓	✓	✓	✓	
B	A38 / Buntsford Drive to South of A38 / Charford Road	Walking / Cycling / Highway	✓	✓	✓	✓	✓
C	A38 / Stoke Road / Charford Road	Walking / Cycling / Highway	✓	✓	✓	✓	✓
D	A38 / New Road	Walking / Cycling / Public Transport / Highway	✓	✓	✓	✓	✓
E	A38 / A448 (Oakalls Roundabout)	Walking / Cycling / Highway	✓	✓	✓	✓	✓
F	A38 / Birmingham Road to south of M42 Junction 1	Walking / Cycling / Highway	✓	✓	✓	✓	✓
2a*	Charford Road to Harvington Road	Walking / Cycling	✓		✓	✓	✓

FBC Ref	Scheme Description	Modes supported	Objectives				
			Reduce congestion and transport costs	Maximise the efficiency of the road network	Increase journey time reliability	Support the delivery of housing and employment growth, as outlined in the adopted Local Plans	Improve connectivity for pedestrians and cyclists on and across the A38 corridor
2b*	Charford Road to Harvington Road (extension along Charford Road)	Walking / Cycling	✓		✓	✓	✓
3	Bromsgrove Train Station to Town Centre	Walking / Cycling	✓		✓	✓	✓
4*	A448 near Blackwood Road	Walking / Cycling	✓		✓	✓	✓
6	Regents Park Road Connection to Oakalls Loop	Walking / Cycling	✓		✓	✓	✓
7	Bus shelters and RTI – New Road	Public Transport	✓			✓	
8	PT Select Vehicle detection	Public Transport	✓	✓	✓		
9	Stratford Road to Scheme 2a	Walking / Cycling	✓		✓	✓	✓

** Phase 2 Scheme 2a, 2b and 4 have been constructed as an early delivery scheme, funded by WLEP.*

In summary the Strategic Dimension of A38 BREP Phase 3 schemes identifies that:

- The A38 corridor currently experiences congestion and journey time variability. These problems are expected to become considerably worse in the future. If no improvements are delivered journey times are predicted to increase considerably.
- The A38 BREP supports the delivery of 5310 homes and 13.45 Hectares of employment land based on the current Local Plans. Subject to the ongoing Local Plans review process, the scheme may further support delivery of additional homes.

- The adopted Local Plans identify development which will place additional pressure on the A38 corridor into the future. The A38 is a key constraint to potential further future development.
- There are significant opportunities to better provide for pedestrians and cyclists along the A38 corridor and to build on the improvements currently being delivered locally.
- Improvements to the A38 corridor have a strong policy context and will help to deliver the aims and ambitions of policy and strategy set out by Bromsgrove District Council, WCC, the Worcestershire LEP and Midlands Connect.
- Options assessment work has identified a series of deliverable schemes which tackle congestion and resilience of the network and also provide enhanced facilities for pedestrians and cyclists.
- Design development, through detailed design stage, has shown schemes are deliverable. These designs have been used as the basis for costing by the preferred contractors, the tender returns include robust costing that use up to date market rates, which form the basis of this FBC Finance Dimension.
- All schemes identified for the corridor have reasonable level support from key stakeholders.
- Due to funding limitations, the scheme has been phased into Phase 3 and Phase 4. This bid includes Phase 3 only, in addition to Phase 2 early delivery schemes that have been delivered.

All aspects of the FBC are aligned reflecting the latest components of Phase 3, traffic modelling, economic, environment and other assessment work.

The A38 BREP Phase 3 aligns closely with the overall aspirations of the LEPs, WCC, Bromsgrove District Council as well as Redditch Borough Council. It also supports the Governments national priorities and the Midlands Connect Strategy for the region. The scheme remains a high priority both for WCC and WLEP, and it is well developed, has a strong Strategic Dimension, and is backed by political support and is included in Worcestershire's LTP4 and the City and Town Centre Investment Programme of WLEP's SEP. It also features in WLEP's 2020-2040 Plan for Growth vision document (as one of the three key pieces of physical infrastructure projects) and in the Regional Evidence Base, compiled by Midlands Connect. Not delivering significant enhancements to the A38 corridor will mean that the MRN national priorities will not be achieved in the region, and the objectives of key policies will also not be realised.

The core schemes within the A38 BREP Phase 3 remained as it is compared to the OBC schemes, therefore WCC believes that the Strategic Dimension of Phase 3 schemes remains robust.