A38 Bromsgrove Route Enhancement Programme

Outline Business Case

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Strategic Case

A38 Bromsgrove Route Enhancement Programme

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V1.4	Nov 2021	OBC (final including WCC comments)	TA	PB	PB	PB

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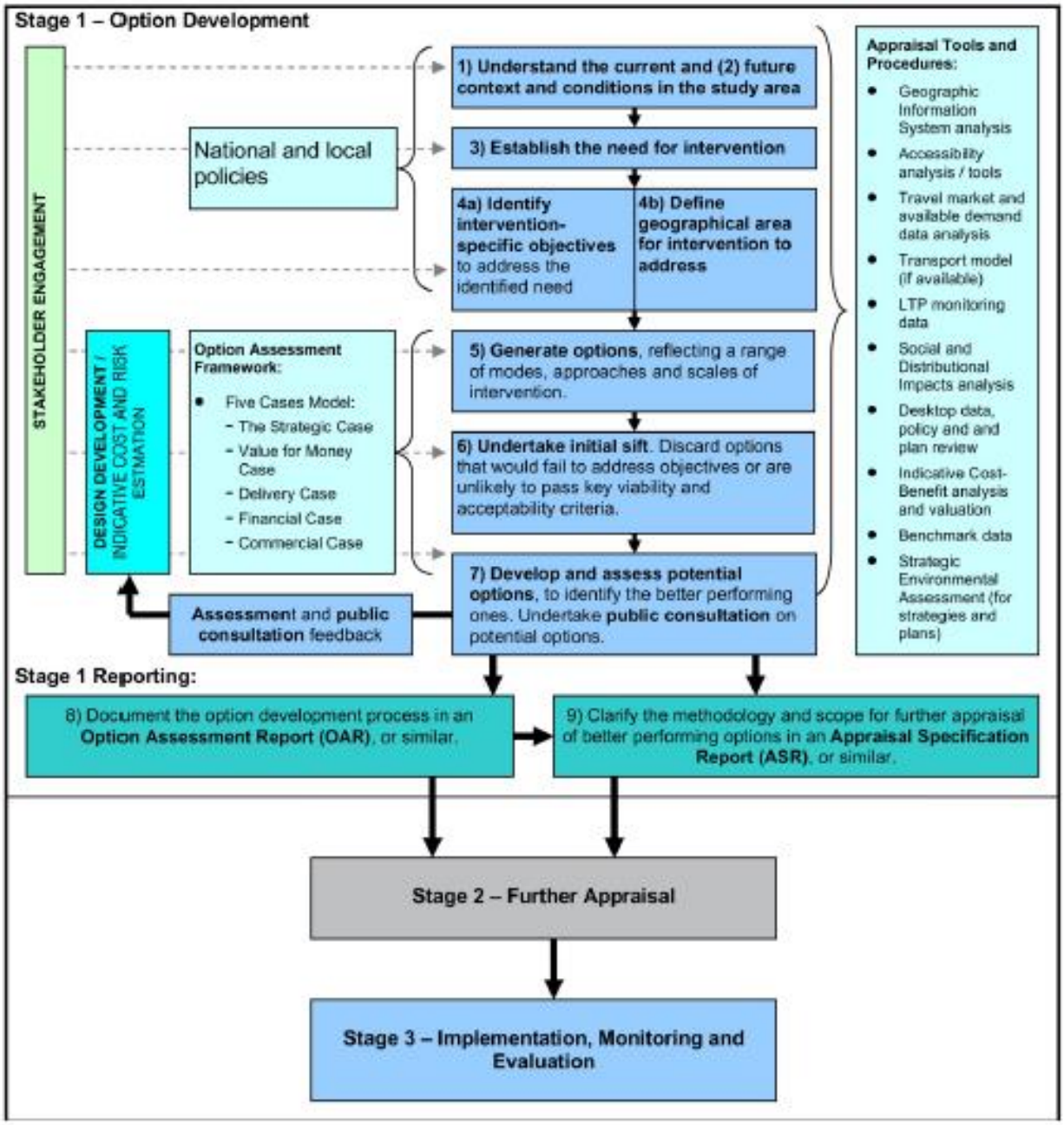
Strategic Case

2.1 Introduction

This section sets out the Strategic Case for investment in the A38 Bromsgrove Route Enhancement Package (BREP). It explains the wider context, presents the rationale for the scheme and makes the case for why the investment is required. The Strategic Case 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 Tasks 5, 6 and 7 of Stage 1, as shown in Figure 0.1.

Figure 0.1- Transport appraisal stages and tasks (reproduced from Transport Analysis Guidance: The Transport Appraisal Process. DfT, May 2018)



The Strategic Case:

- Explains out 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 BREP scheme and how they align with problems identified and the MRN requirements;
- Presents the key measures for success for the scheme;
- Sets out the scope of the BREP schemes, including setting out the elements which are being separately funded and delivered, and those which are included within this MRN business case;
- Identifies high level constraints and explains the factors (interdependencies) upon which the successful delivery of the project is dependent;
- Outlines how stakeholders have been involved in the development of the scheme; and
- Provides detail on the option identification process.

2.1.1 The A38 corridor

The A38 corridor has a unique character which contributes to the problems and issues discussed in the following sections. The key characteristics are:

- Overall the A38 is a route that performs a range of different functions, acting as a link to the Strategic Road Network and as a bypass to 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 various sections with differing speed limits, frontages and access points and varying levels of provision for pedestrians and cyclists. In addition, the pattern of surrounding land use changes meaning that the overall character and feel of the route varies.
- Generally high levels of car dependency across Bromsgrove (as detailed in section 2.4.6), is an 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 to encourage better take up of sustainable modes.

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 road and surface access to international gateways and HS2 stations for Worcestershire residents at Birmingham Airport and Birmingham Interchange via M42 Junction 1 and Birmingham Curzon Street 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.

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 the railway station, situated to the east of the A38.

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.

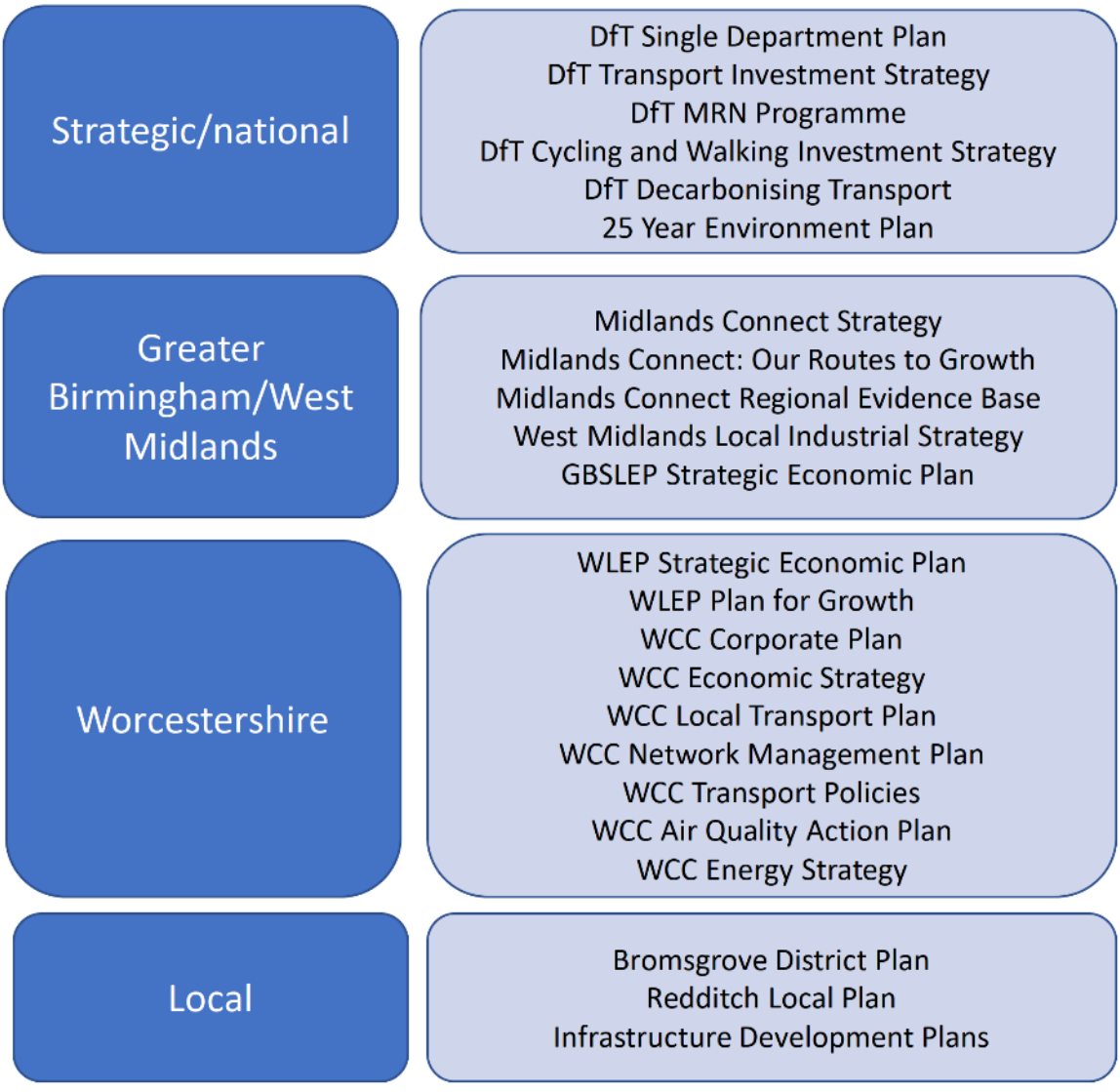
2.2 Business Strategy

2.2.1 Overview of policy context

The A38 scheme 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 Case provides an overview of the overall policy context within which this scheme sits. The main policies and strategies considered are shown in Figure 0.2.

Figure 0.2 – Policy context (key documents)



2.2.2 Strategic/national policy context

Table 0.1 highlights the national level strategic policy context, within which the A38 BREB scheme has been developed. The scheme aligns closely with the objectives of the DfT's MRN programme and wider policy.

Table 0.1 – Strategic policy context

Policy/strategy	Relevance/key ambitions	Contribution of this scheme (compared to a future no intervention scenario)
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 A38 BREP scheme will help to meet the DfT's wider department vision by improving efficiency on the A38 corridor, supporting future growth and supporting walking and cycling as sustainable 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	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 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 since SOBC stage 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.
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 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.	The scheme includes cycling infrastructure as an integral part of the overall package, recognising that these enhancements are crucial alongside the wider BREP interventions.
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	The inclusion of walking and cycling schemes with BREP will help to encourage sustainable travel choices in the longer term.

	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.	
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.

2.2.3 Greater Birmingham and Midlands policy context

Table 0.2 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 scheme falls within Worcestershire it is clear that the scheme has a regional significance.

Table 0.2 – Greater Birmingham/Midlands policy context

Policy/strategy	**Relevance/key ambitions**	**Contribution of this 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 A38 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 refresh (Jan 2021 and ongoing)	Midlands Connect is reviewing its transport strategy. The January 2021 challenges and opportunities document continues to recognise the need for improvements that will enable businesses and population across the Midlands to grow.	
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	
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 OBC 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	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.

	motorway junctions and at other well-connected sites…"	
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 support the wider industrial strategy for the region.

2.2.4 Worcestershire policy context

Table 0.3 summarises the key policy drivers across Worcestershire ambition and strategy. This shows that improvements to the A38 are a clear priority for Worcestershire and that the scheme is closely aligned with the overall business strategy of both the LEP and WCC.

Table 0.3 – Worcestershire policy context

Policy/strategy	**Relevance/key ambitions**	**Contribution of this 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 2017 - 2022	'Open for business' is the key priority. Continued investment in transport infrastructure is noted as essential and the Plan states that 'Transport infrastructure investment will be targeted to unlock the potential of key employment and housing development site across the county'.	Increasing capacity and reducing congestion on the A38 in Bromsgrove is listed in the Corporate Plan as one of three key priorities for transport investment. The A38 BREP scheme will delivery directly against this commitment.
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 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	This scheme will address the priorities of the adopted LTP.

	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 refined scheme for the A38 corridor includes targeted improvements for pedestrians and cyclist 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.
WCC 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
WCC 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 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. 3 of these cross the A38. Following this success WCC has been actively identifying further opportunities for enhancements to walking and cycling infrastructure including adjacent to and across the A38.	Removing the barrier/segregation caused by the A38 would increase the attractiveness of the railway station and using more sustainable modes to travel around the town. Improved connectivity to and from the railway station, combined with improved services, will support access to the planned HS2 stations in Birmingham.

2.2.5 Local policy context

Table 0.4 summarises the local level District Council policy context.

Table 0.4 – Worcestershire policy context

Policy/strategy	Relevance/key ambitions	Contribution of this scheme (compared to a future no intervention scenario)
Adopted Bromsgrove District Plan (2017)	The adopted Bromsgrove District Plan includes major residential development sites around the edge of Bromsgrove, close to the A38, including key sites at Perryfields Road and Whitford Road.	This scheme will deliver the improvements required to support the development envisaged across Bromsgrove District and will also support the important cross- border sites.

	There are also significant cross-boundary allocations within the Redditch Local Plan at Foxlydiate and Brockhill. Overall the Local Plan allocates land for 4,700 of the required 7,000 dwellings (and 28 Hectares of employment land) to 2030 – the majority of these sites are now consented., with S106 contributions to the A38 BREP but no conditions preventing build out ahead of the BREP scheme. The remaining 2,300 units for 2023 to 2030 were to be identified following a Green Belt review and incorporated with a Local Plan Review. This review remains underway. The Local Plan supports sustainable transport infrastructure improvements to provide a better walking and cycling experience in and around Bromsgrove's urban area.	
Bromsgrove District Plan review (ongoing)	The District Plan review, incorporating a review of the Green Belt, is underway. An issues and options consultation was undertaken in 2018 and a call for sites was completed in 2019. The early stage of the Plan review means that there is no certainty around future sites at this stage.	In Worcestershire County Council's response to the ongoing Bromsgrove District 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.
Adopted Redditch Local Plan (2017)	The Redditch Local Plan allocates a cross boundary site within Bromsgrove district at Foxlydiate. This site is located close to the A448 corridor, which in turn connect to the A38 at Bromsgrove. In addition, the Redditch Local Plan allocates land at Brockhill as a cross boundary site, plus additional development within Redditch itself.	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 Development Plans	The Infrastructure Delivery Plans (IDP) for both Redditch and Bromsgrove 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.

2.3 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.

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 the railway station and rail services through the use of smart technology and Real Time Information (RTI) 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 the 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 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.

2.4 Existing problems and challenges

The A38 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 section considers 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 this section. In addition, the traffic modelling has used additional data, and this is set out in the Traffic Data Collection Report 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:

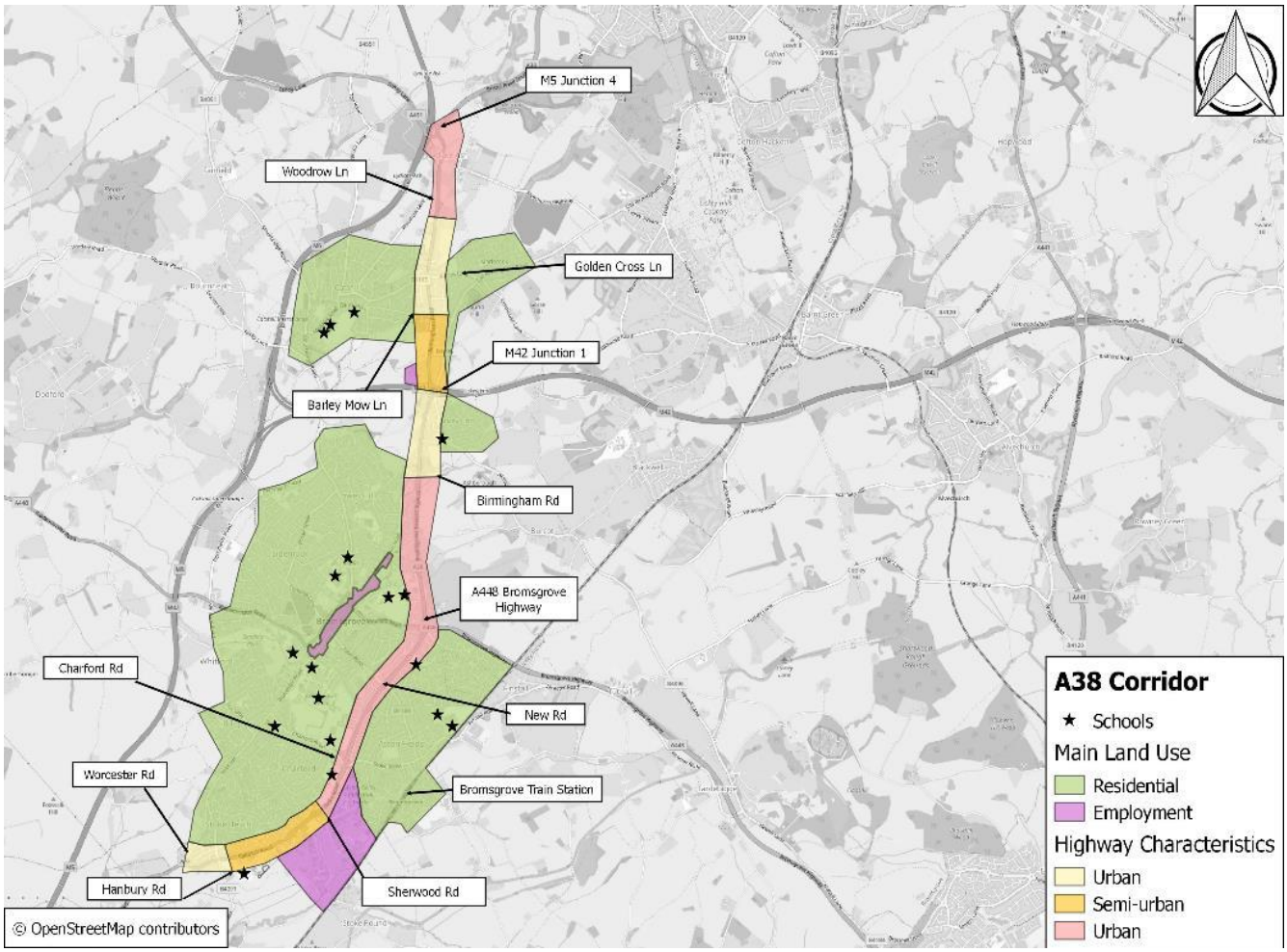
- 2011 Census
- Information provided by National Highways on diversion interventions from the M5 and M42 onto the A38

More details on each of the problems and considerations is included in the OAR, included as Appendix S.1.

2.4.1 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 0.3 below shows a summary of the A38 corridor in the study area, and it's differing character and adjacent land use.

Figure 0.3 – Character areas, reflecting highway design standard and adjoining uses



2.4.2 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.

2.4.3 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 the railway station to the east of the A38, leading to a degree of severance.

2.4.4 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.

2.4.5 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 0.4 shows the location of the three RSI sites in relation to the A38 corridor. Figure 0.5 to Figure 0.7 show the origins-destinations based on the data collected for each site, while Figure 0.8 combines the same data for the three sites

Figure 0.4 – RSI Site Locations (2017 Survey)

Figure 0.5 – Combined RSI Site A - Origin Destinations

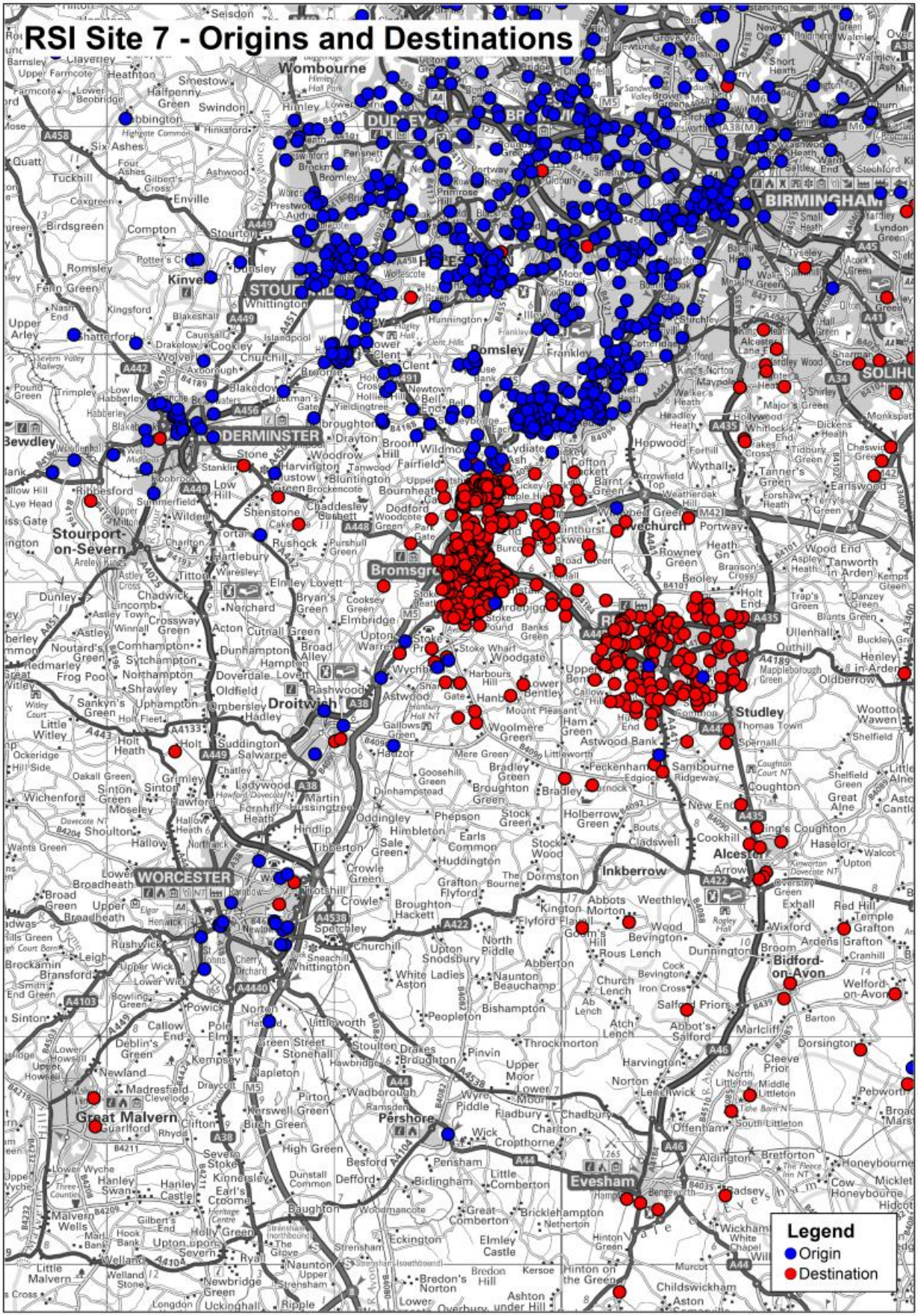


Figure 0.6 – Combined RSI Sites B - Origin Destinations

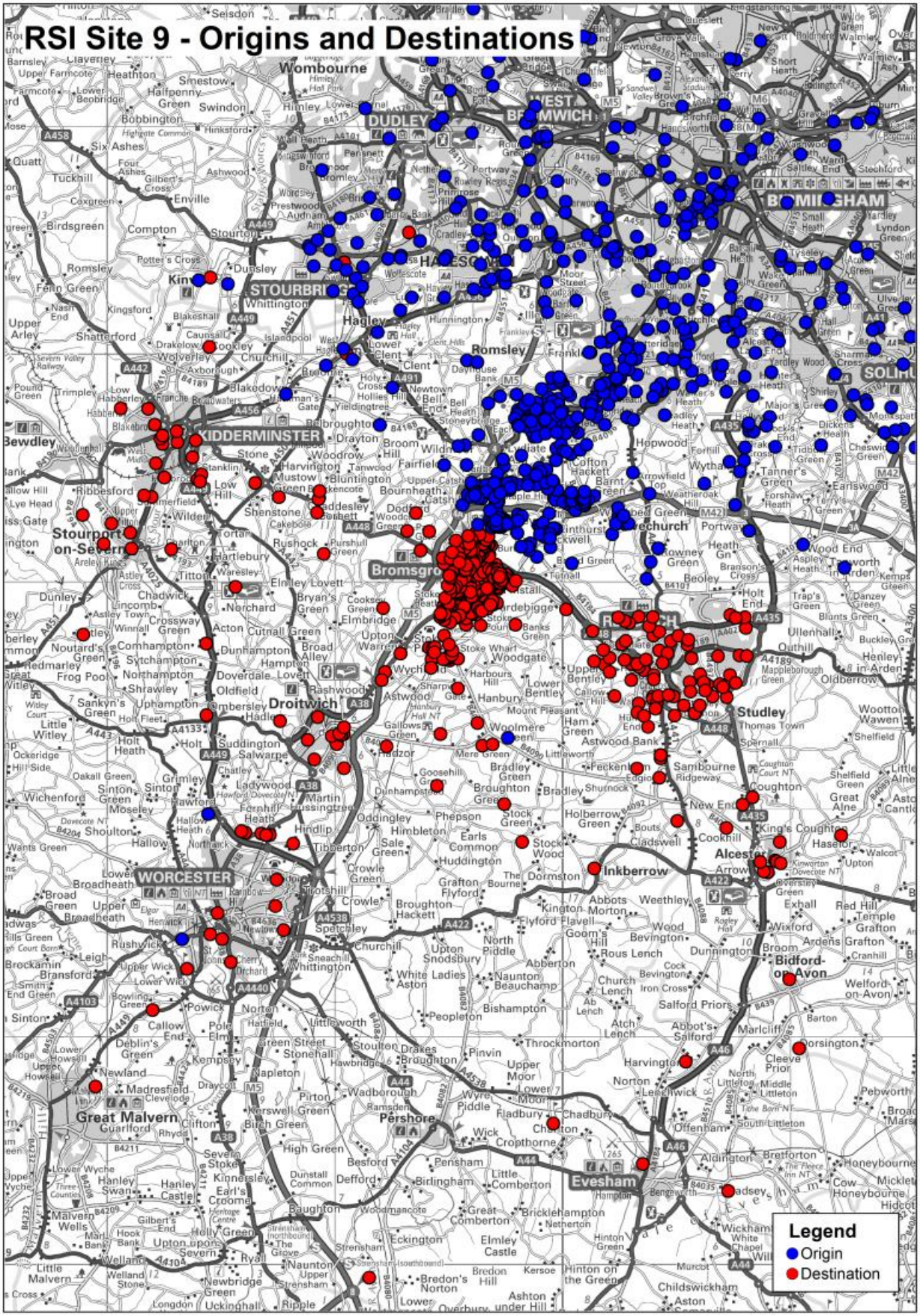


Figure 0.7 – Combined RSI Sites C - Origin Destinations

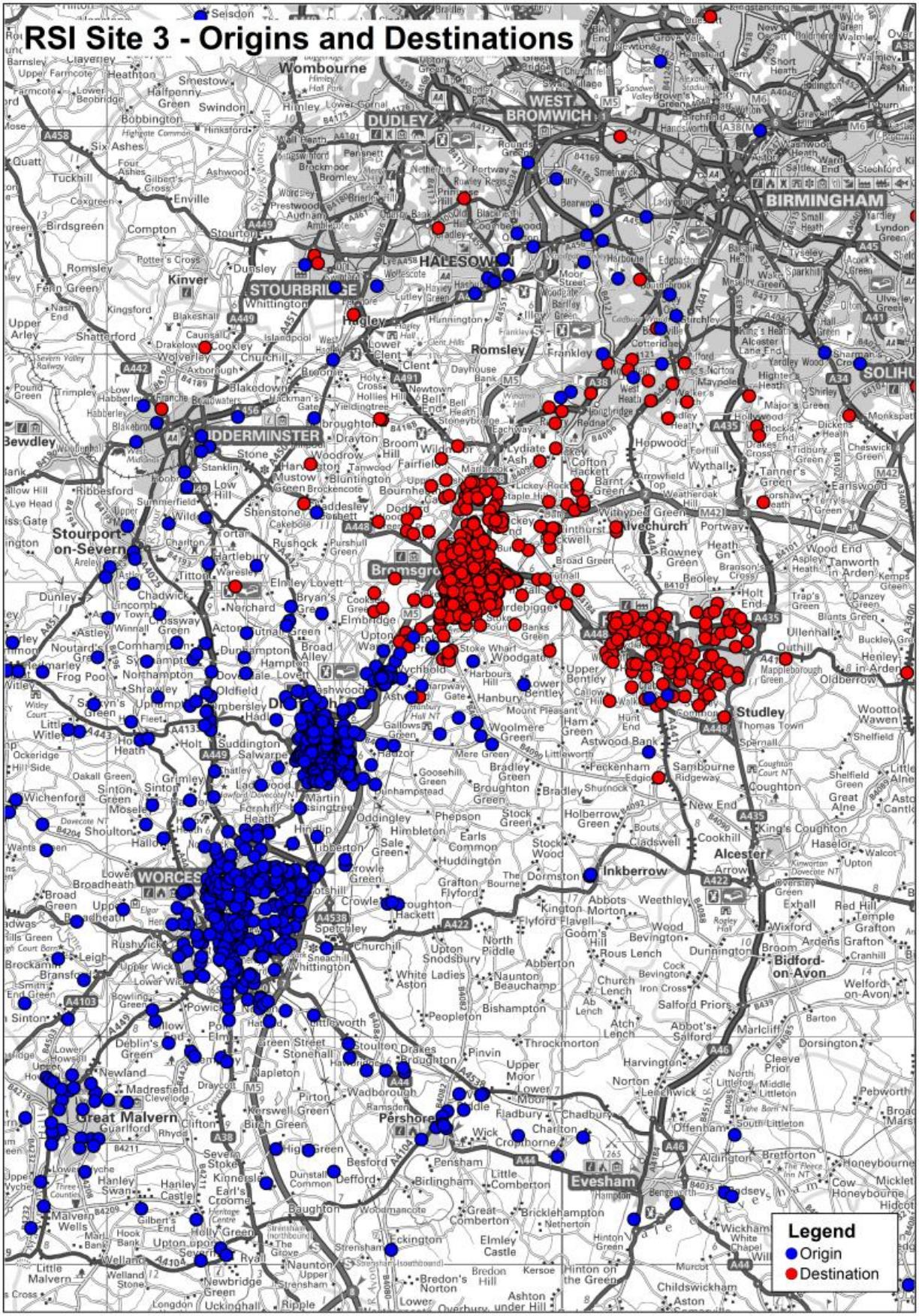
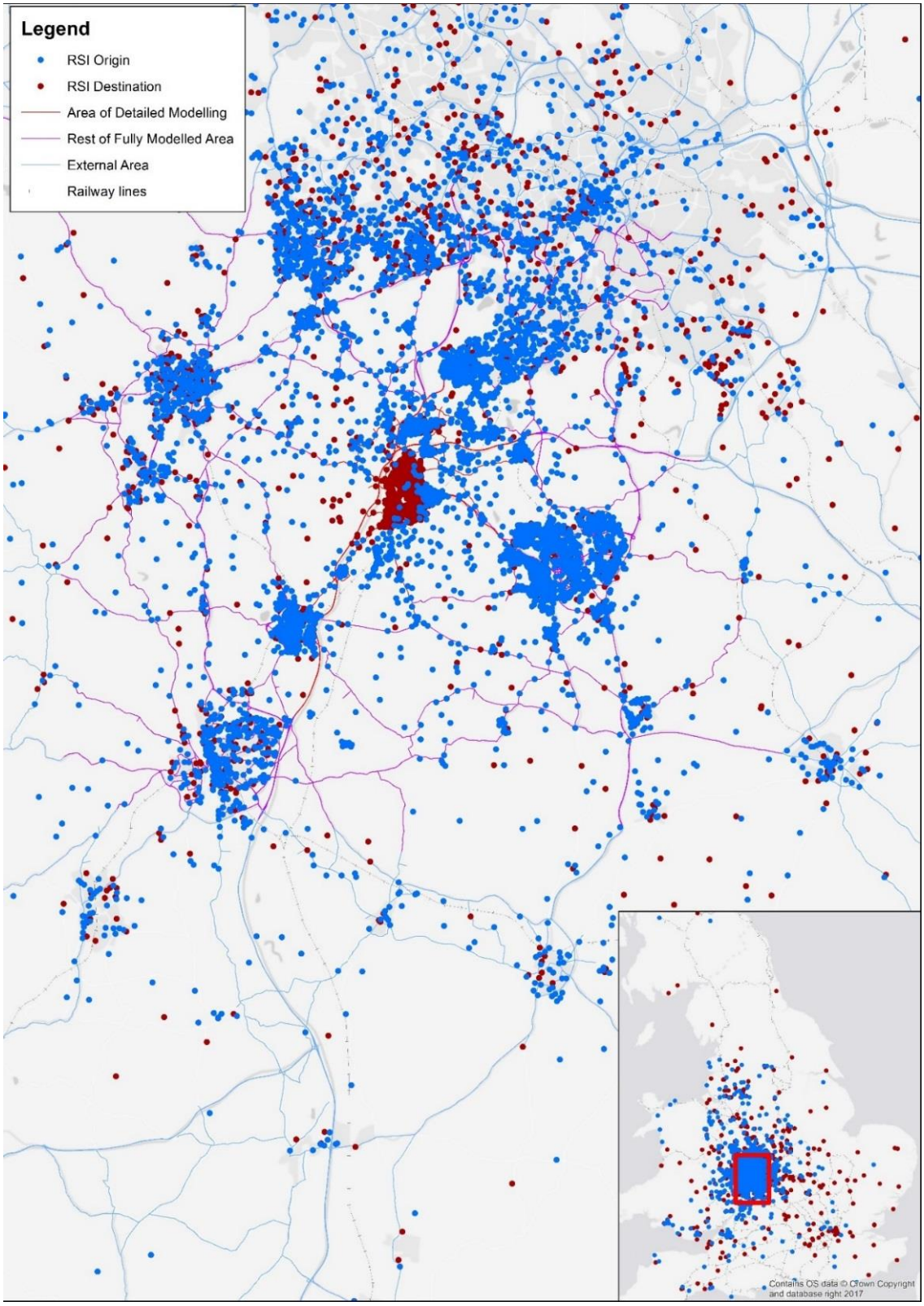


Figure 0.8 – Combined RSI Sites (A/B/C) - Origin Destinations



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.

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.

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 utilising the M5 corridor.

OD Data Evaluation Tables

The RSI data at the three locations have demonstrated that there are trips that have the following travel patterns (Table 0.5), which are defined as being either local trips (shorter distance), and strategic trips (longer distance or passing over or along the A38 corridor):

1) Origin and Destination within Bromsgrove (Local Trips) – Assumed as within 5km of Bromsgrove centre

2) Origin or Destination within Bromsgrove (Strategic Trips)

3) Origin and Destination outside of Bromsgrove, but travelling along A38 corridor in part, or its entirety. (Strategic Trips).

Table 0.5 – 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 of 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 over a longer distance. 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.

2.4.6 Census data and socio economic context

The 2011 census data indicates that Bromsgrove has a high level of car dependency (Table 0.6), 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 0.7) than the corresponding West Midlands and England figures.

The travel pattern data (Table 0.8, Table 0.9 and Table 0.10) 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 0.6 – 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 0.7 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 0.7 – 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 0.7 shows that the proportion of multiple cars owning households is significantly higher than the comparative data for England and the West Midlands areas.

Table 0.8 – 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 0.8 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 0.9 – 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 0.10 – 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 0.9 and Table 0.10 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

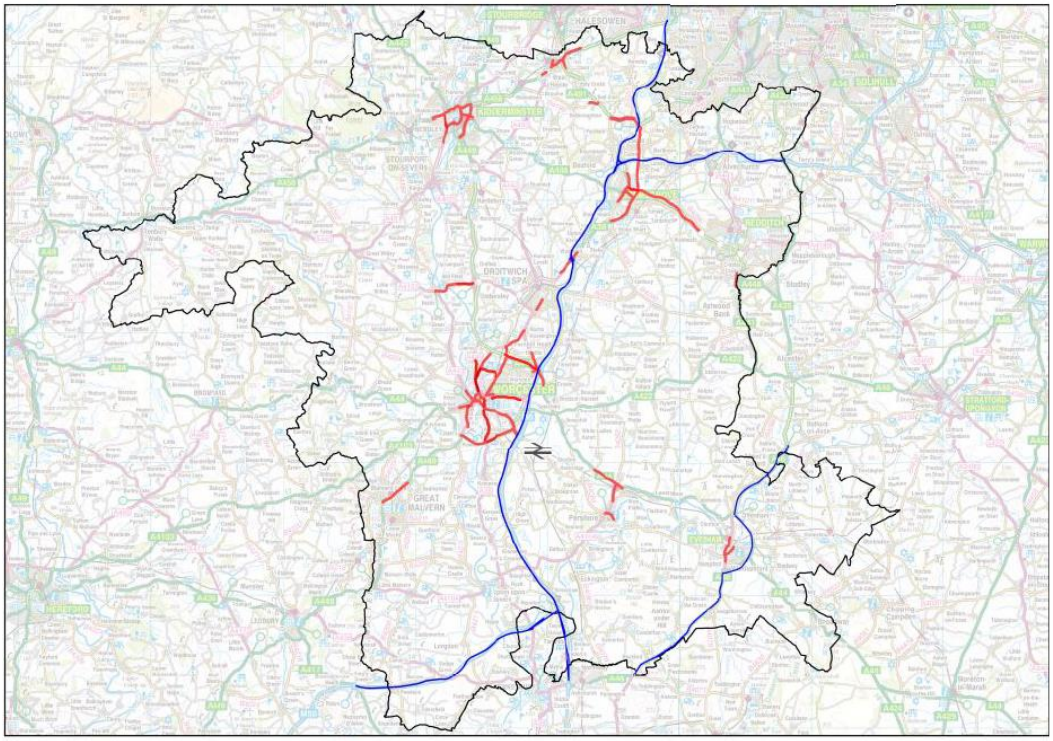
This pattern of car dependency is important context for the A38 corridor enhancements, which seek to improve the strategic and local highway network to better cater for car trips, whilst also providing significantly improved facilities for pedestrians and cyclists across and along the A38 encourage better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

2.4.7 Congestion

The A38 corridor currently experiences significant weekday morning and evening peak congestion. This results in delay 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 Strategic Road Network (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 0.9, taken from the SEP, highlights that the A38 is recognised as a significant area of congestion within the county.

Figure 0.9 – Areas of congestion highlighted in the WSEP

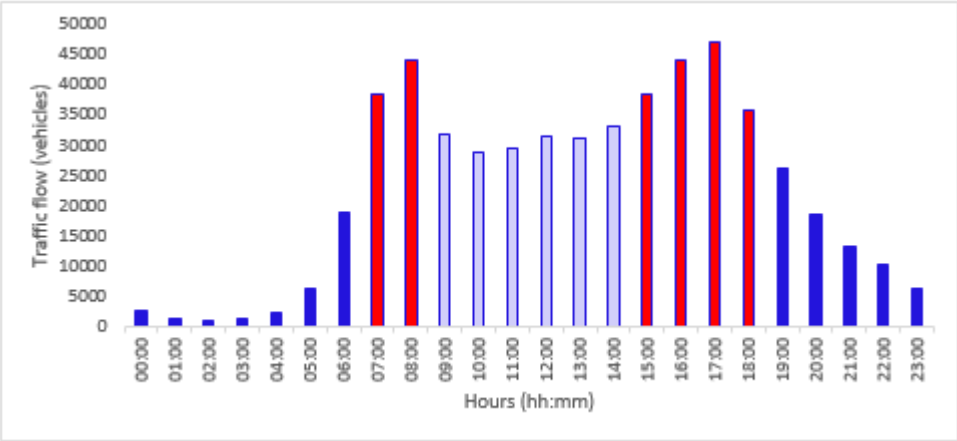


Source: Worcestershire County Council (2014)

2.4.8 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 0.10).

Figure 0.10 - 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 0.11 and Figure 0.12, where the highest volumes of traffic are to the north of the corridor.

Figure 0.11- Modelled baseline traffic volume – AM peak

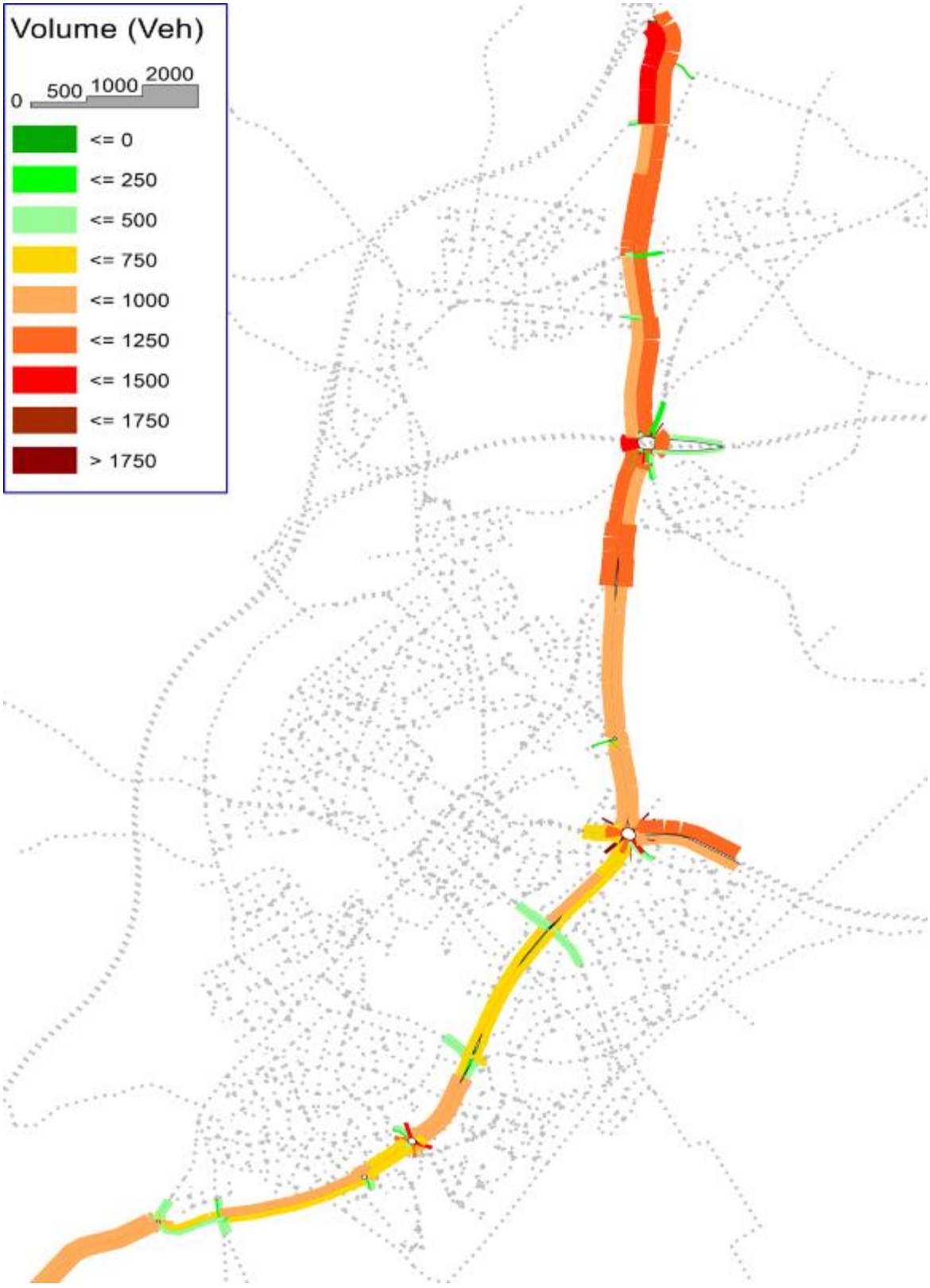
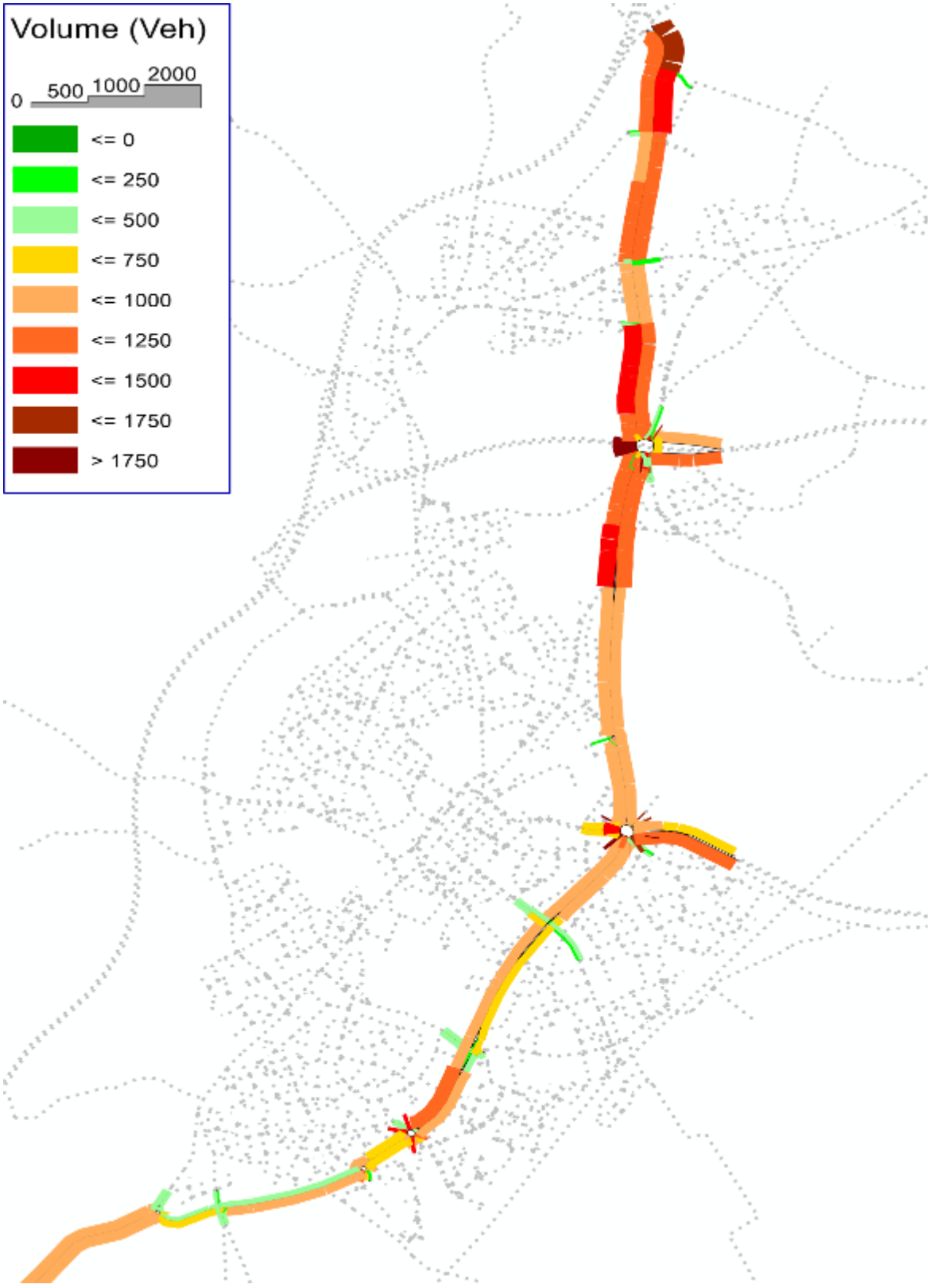


Figure 0.12 - Modelled baseline traffic volume – PM peak



2.4.9 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 0.13 to Figure 0.20 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 0.21 to Figure 0.28 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 project, and data not included in A38 BREP OAR)

Figure 0.13 - AM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/Hanbury Rd Signalised Junction (June 2017 Survey)

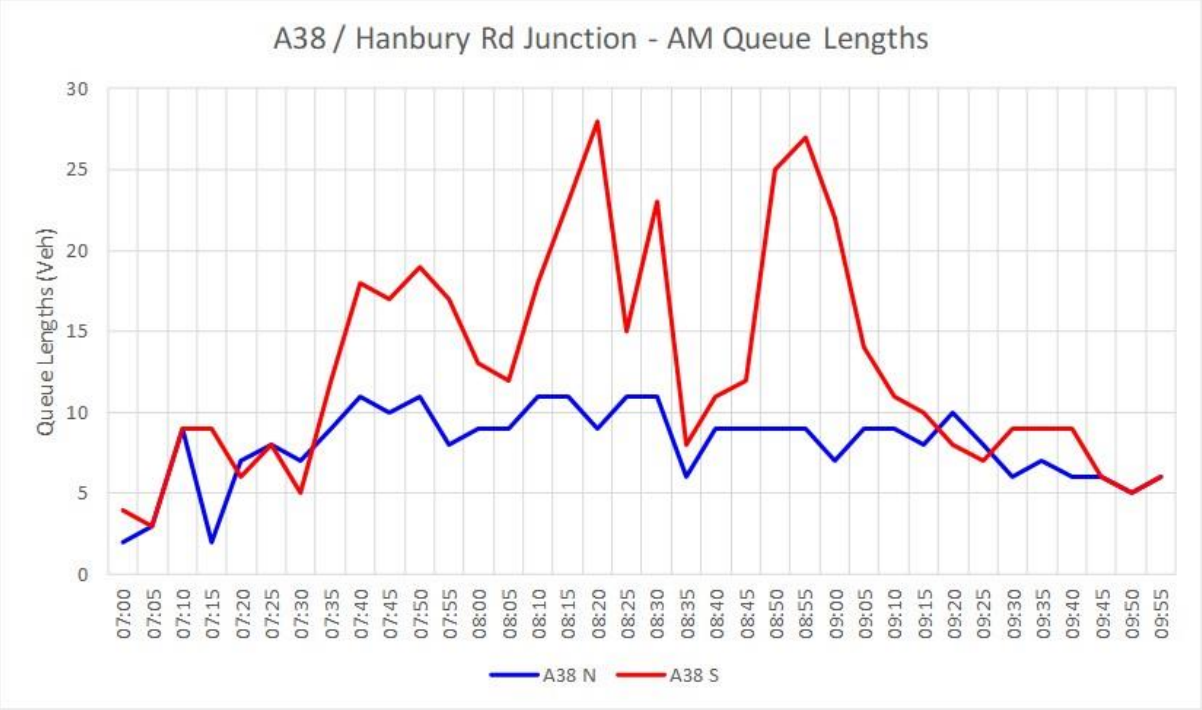


Figure 0.14 - AM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/Stoke Rd/Charford Rd Signalised Junction (June 2017 Survey)

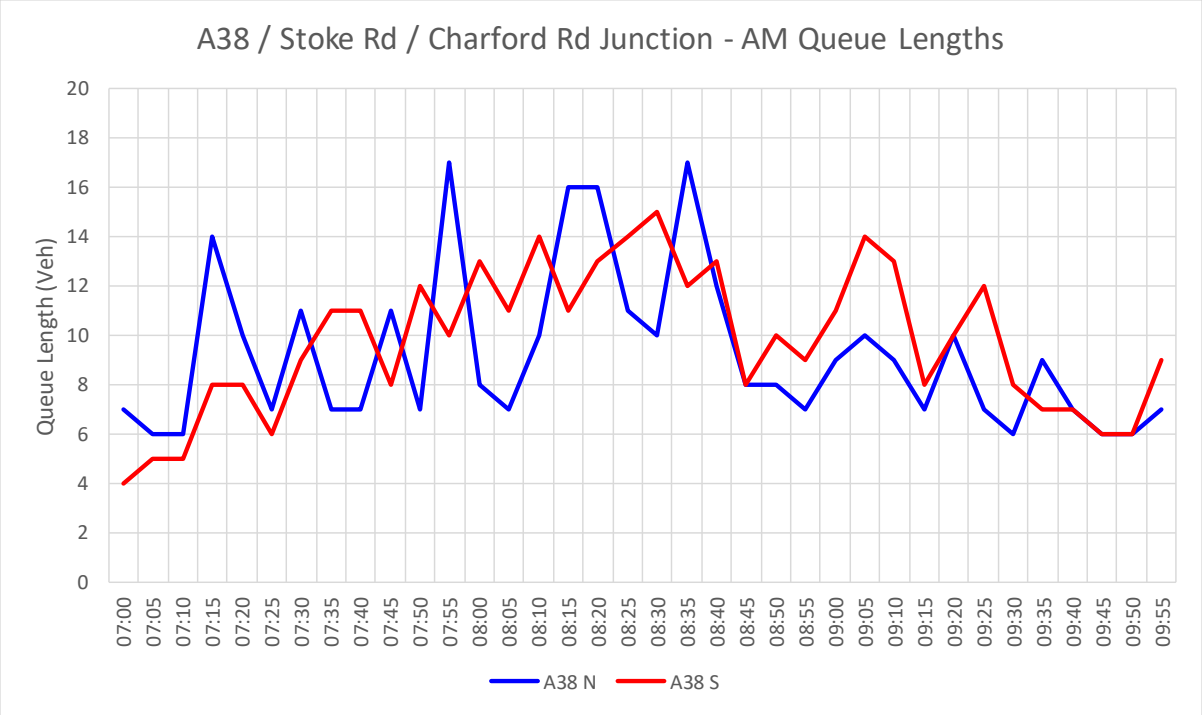


Figure 0.15 - AM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/New Rd Signalised Junction (June 2017 Survey)

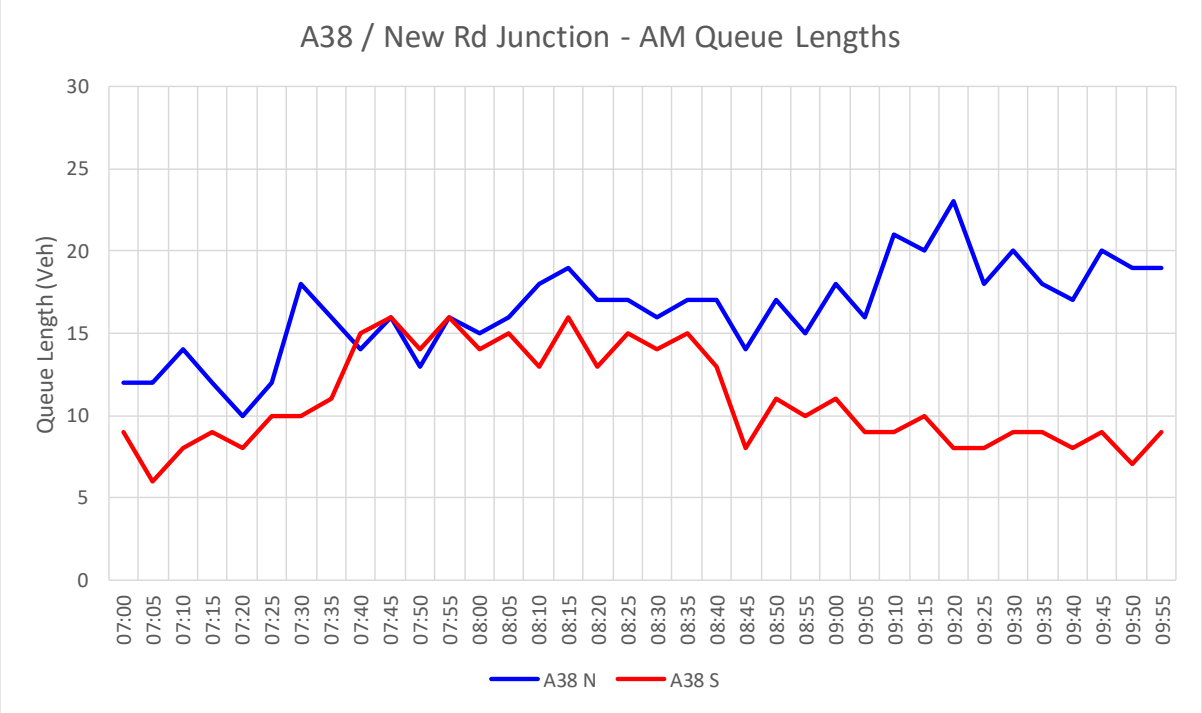


Figure 0.16 - AM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/A448 Signalised Roundabout (June 2017 Survey)

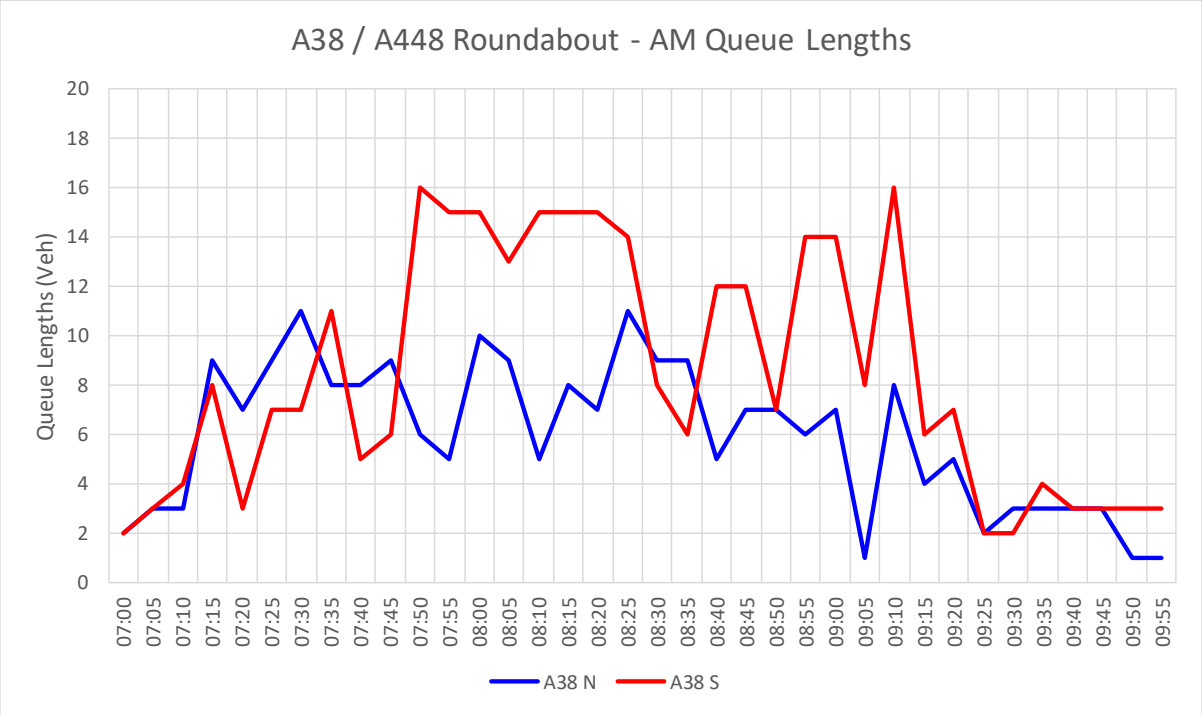


Figure 0.17 - AM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/Birmingham Rd (June 2017 Survey)

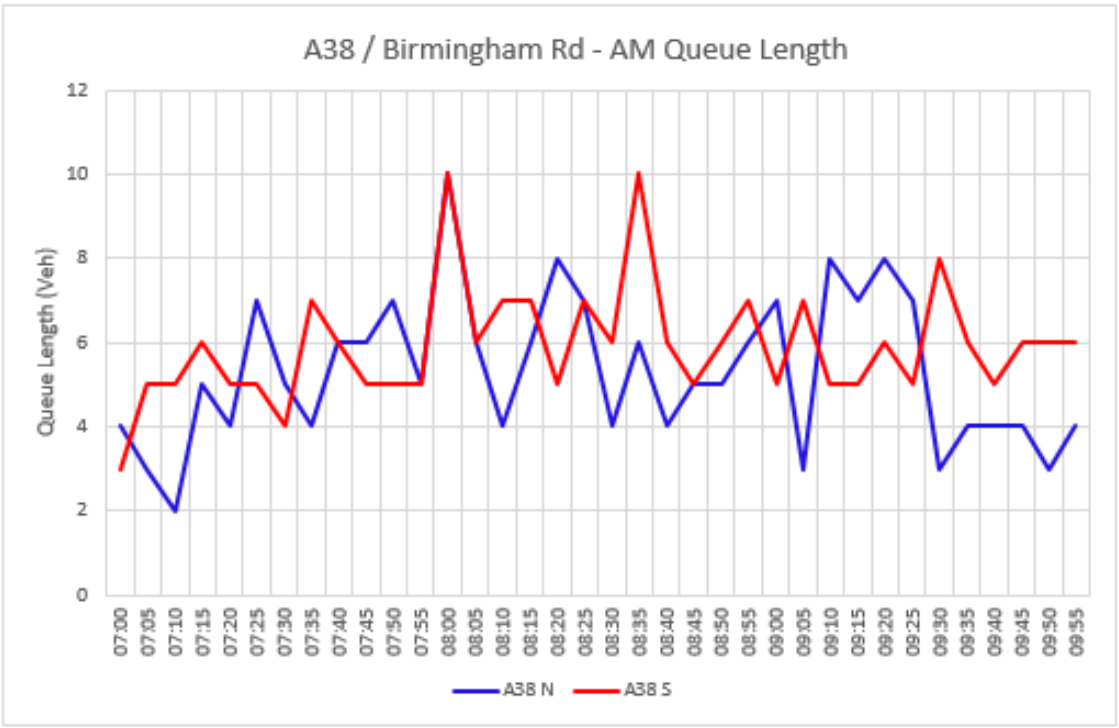


Figure 0.18 - AM Peak Observed Maximum Queue Lengths on A38 NB and SB – M42 Junction 1 Signalised Junction (June 2017 Survey)

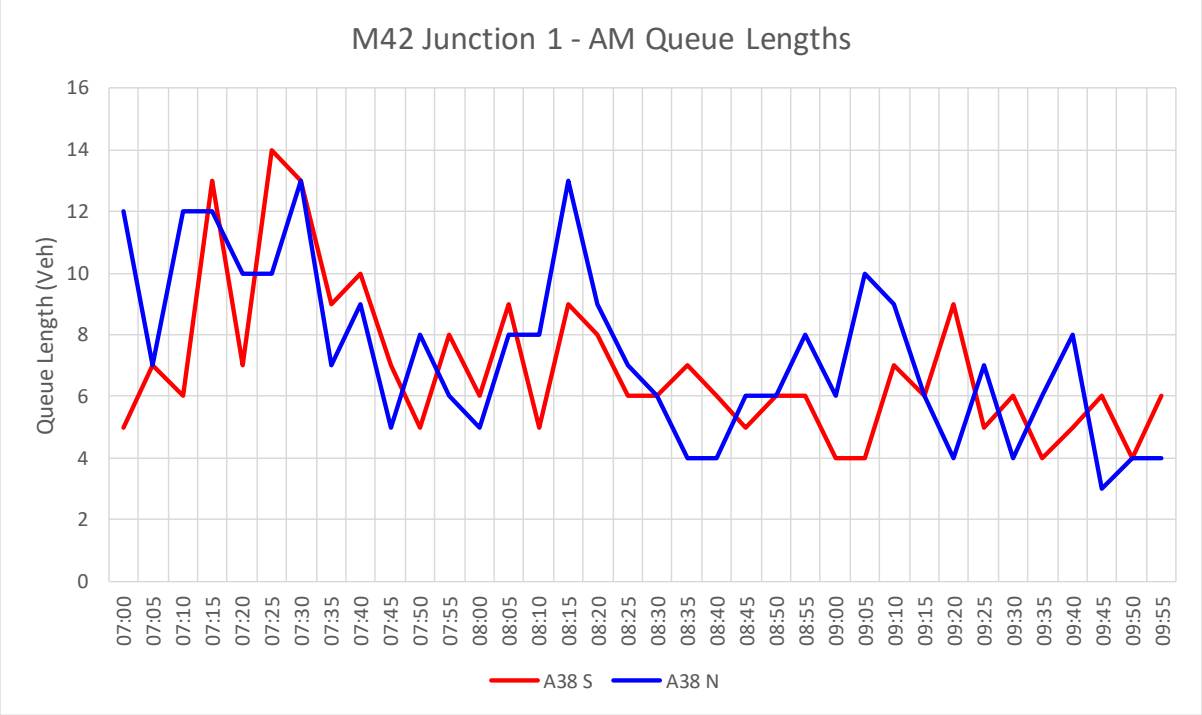


Figure 0.19 - AM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/Golden Cross Ln/Braces Ln Signalised Junction (June 2017 Survey)

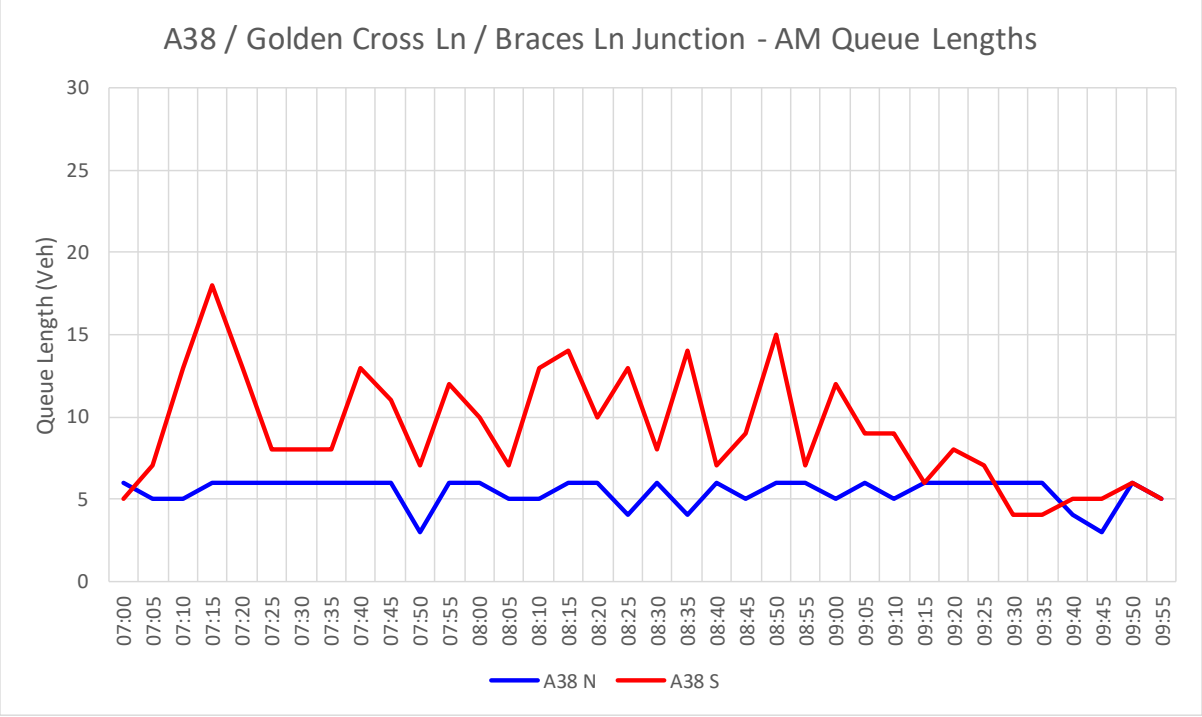


Figure 0.20 - AM Peak Observed Maximum Queue Lengths on A38 NB and SB – M5 Junction 4 Signalised Junction (June 2017 Survey)

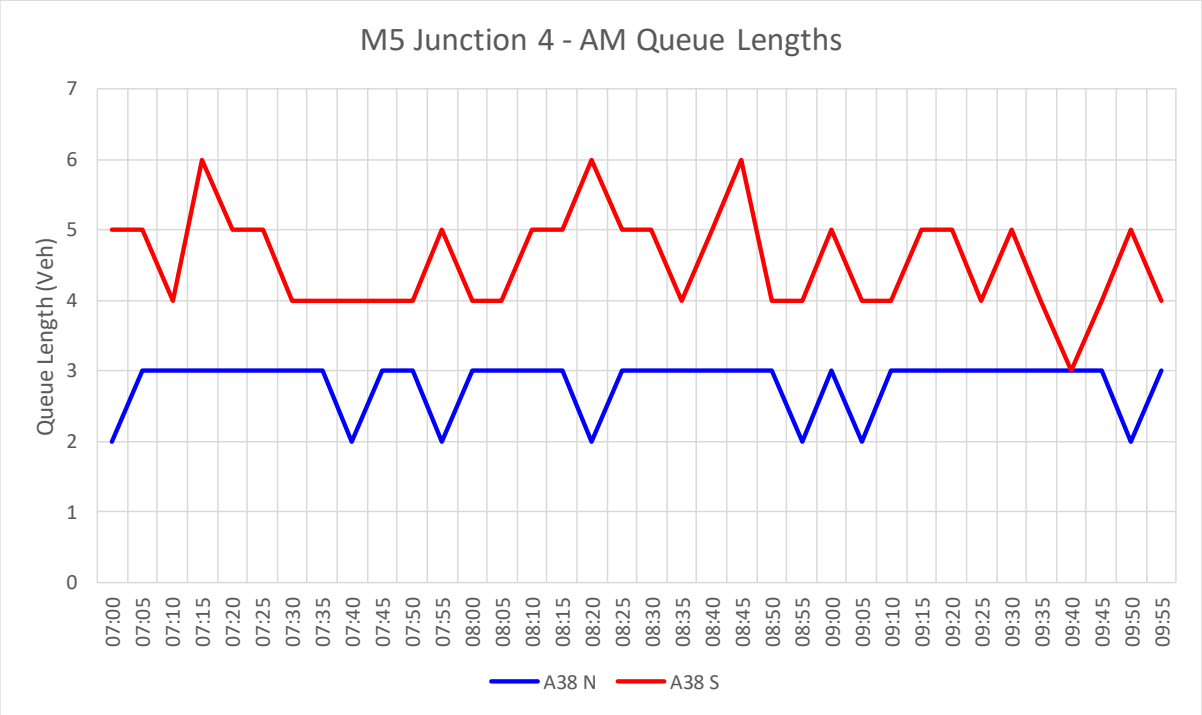


Figure 0.21 - PM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/Hanbury Rd Signalised Junction (June 2017 Survey)

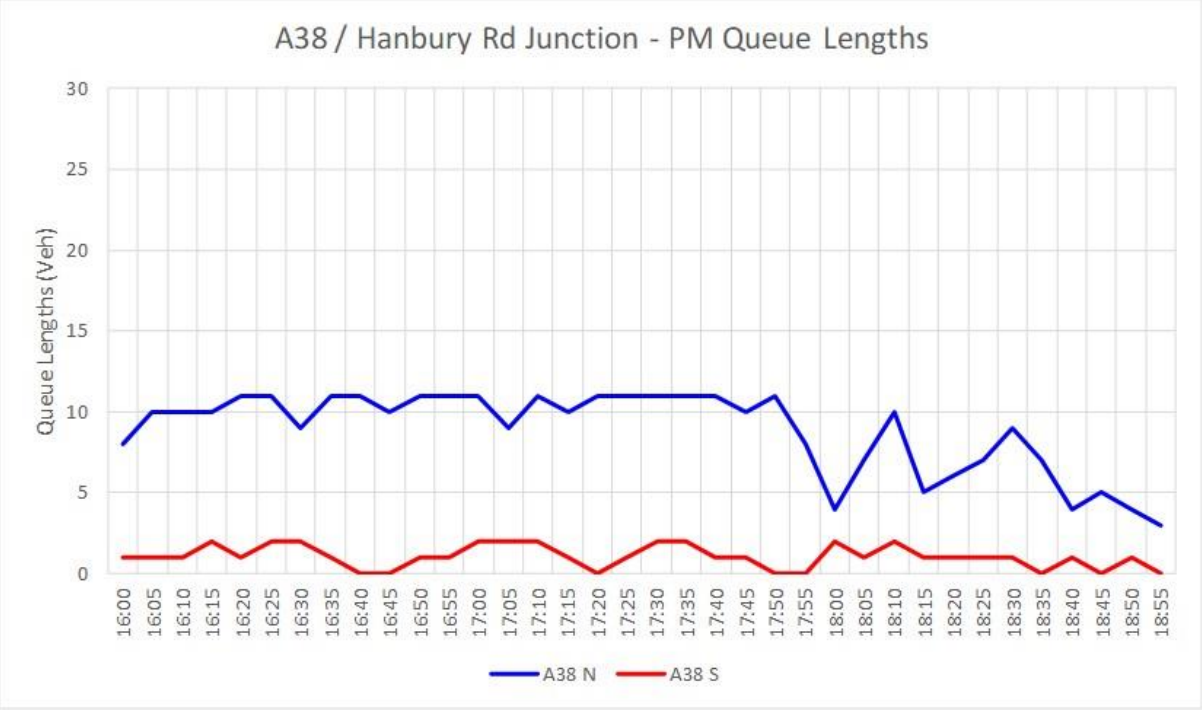


Figure 0.22 - PM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/Stoke Rd/Charford Rd Signalised Junction (June 2017 Survey)

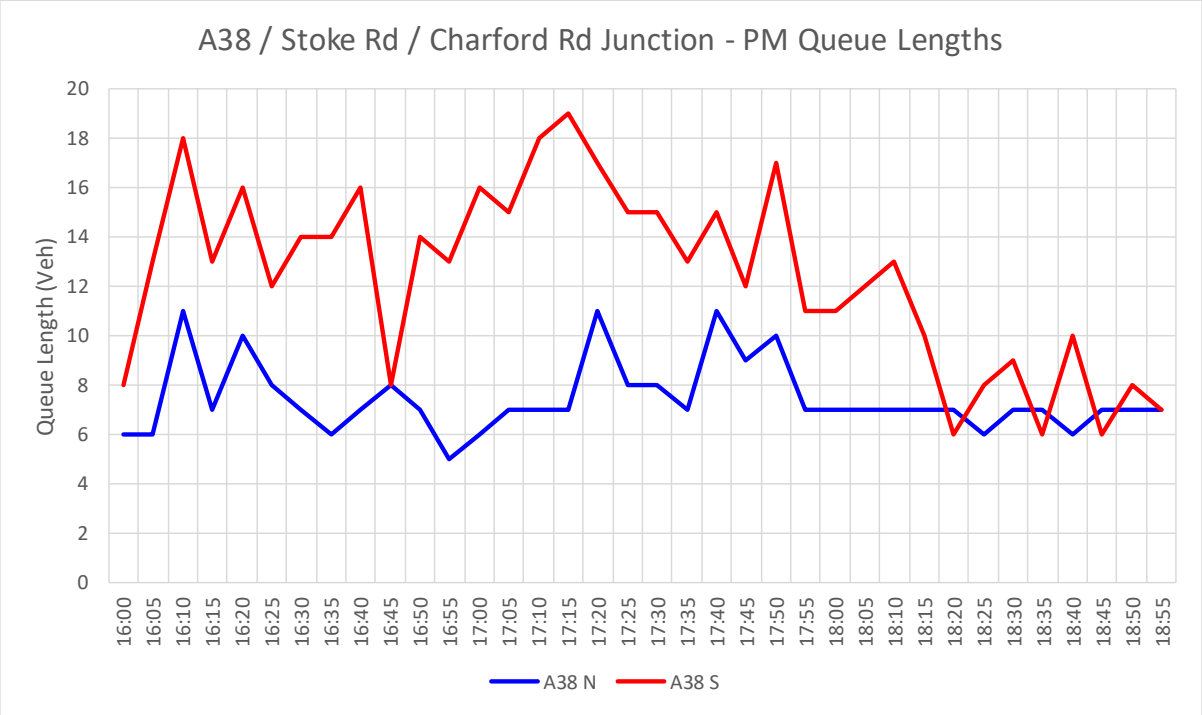


Figure 0.23 - PM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/New Rd Signalised Junction (June 2017 Survey)

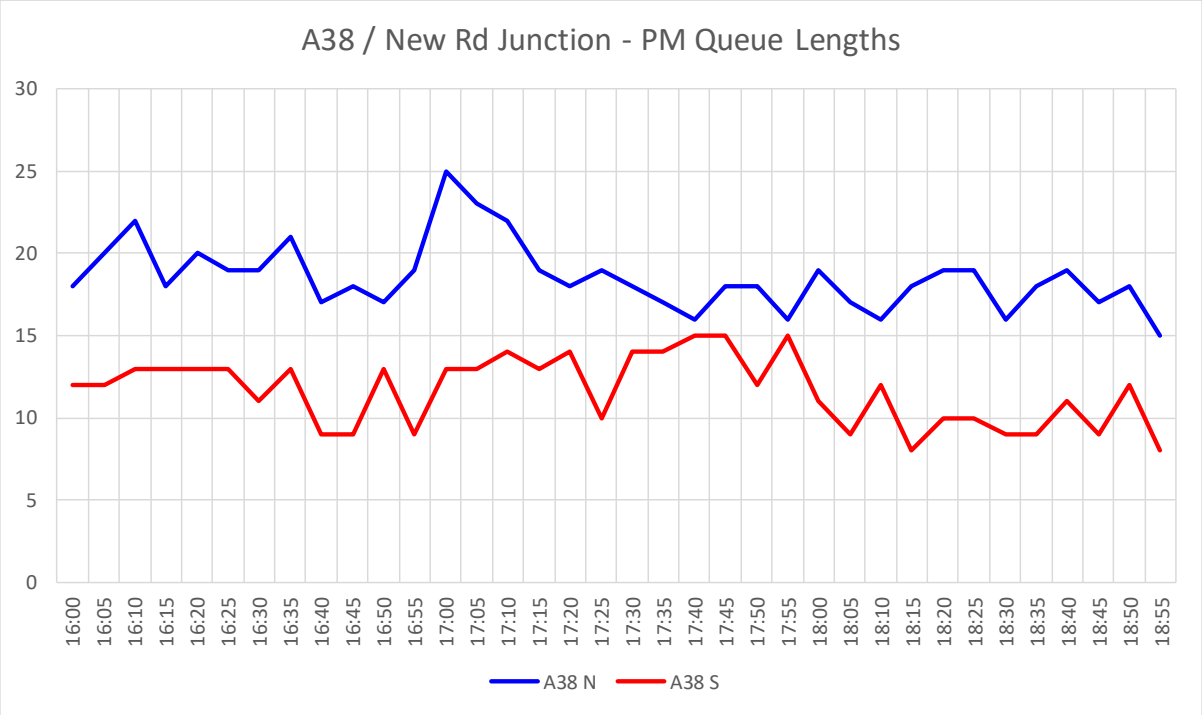


Figure 0.24 - PM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/A448 Signalised Roundabout (June 2017 Survey)

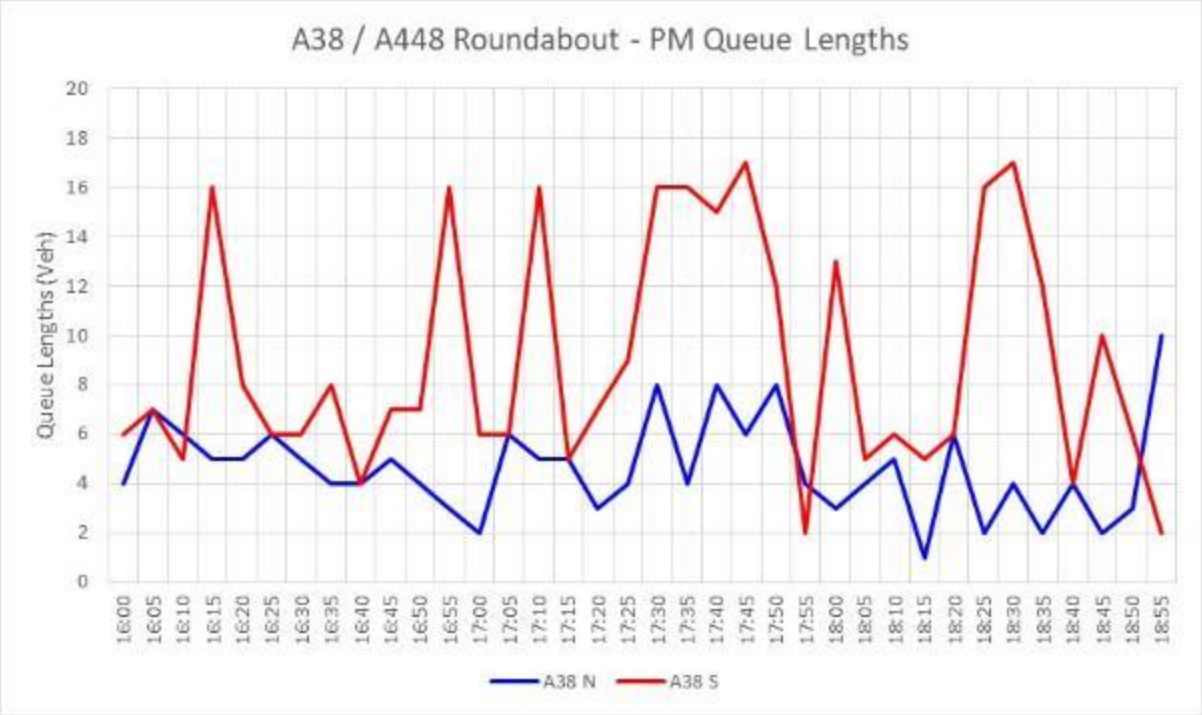


Figure 0.25 - PM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38 Birmingham Rd Signalised Junction (June 2017 Survey)

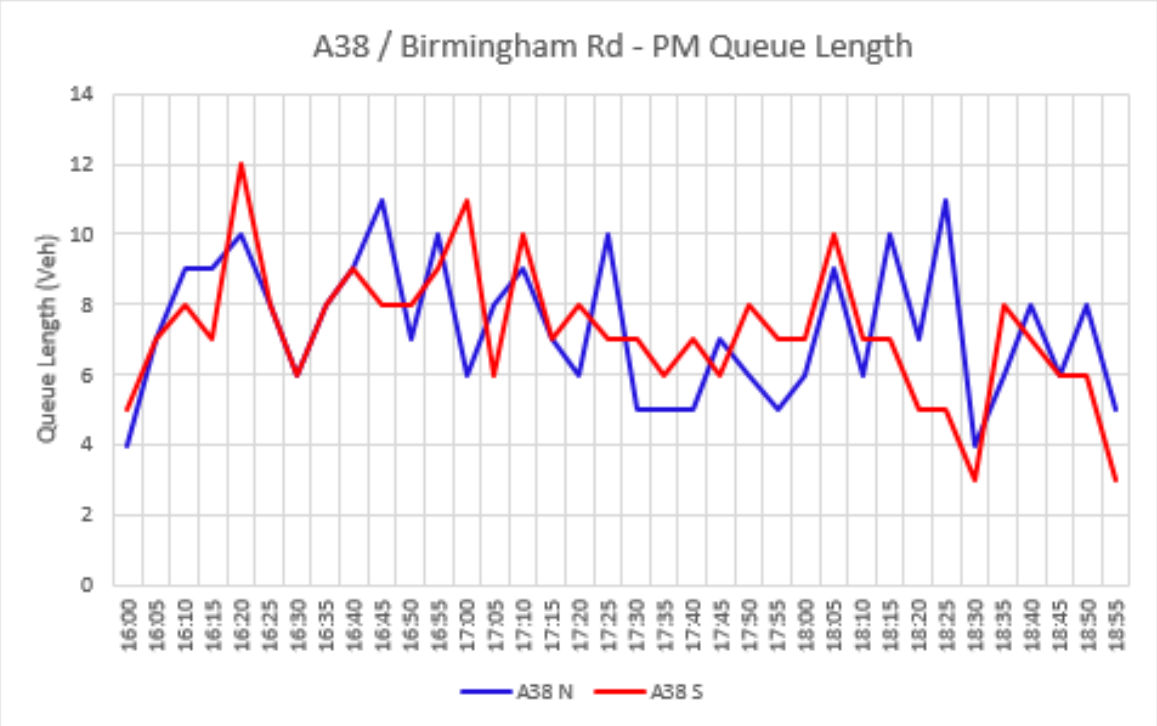


Figure 0.26 - PM Peak Observed Maximum Queue Lengths on A38 NB and SB – M42 Junction 1 Signalised Junction (June 2017 Survey)

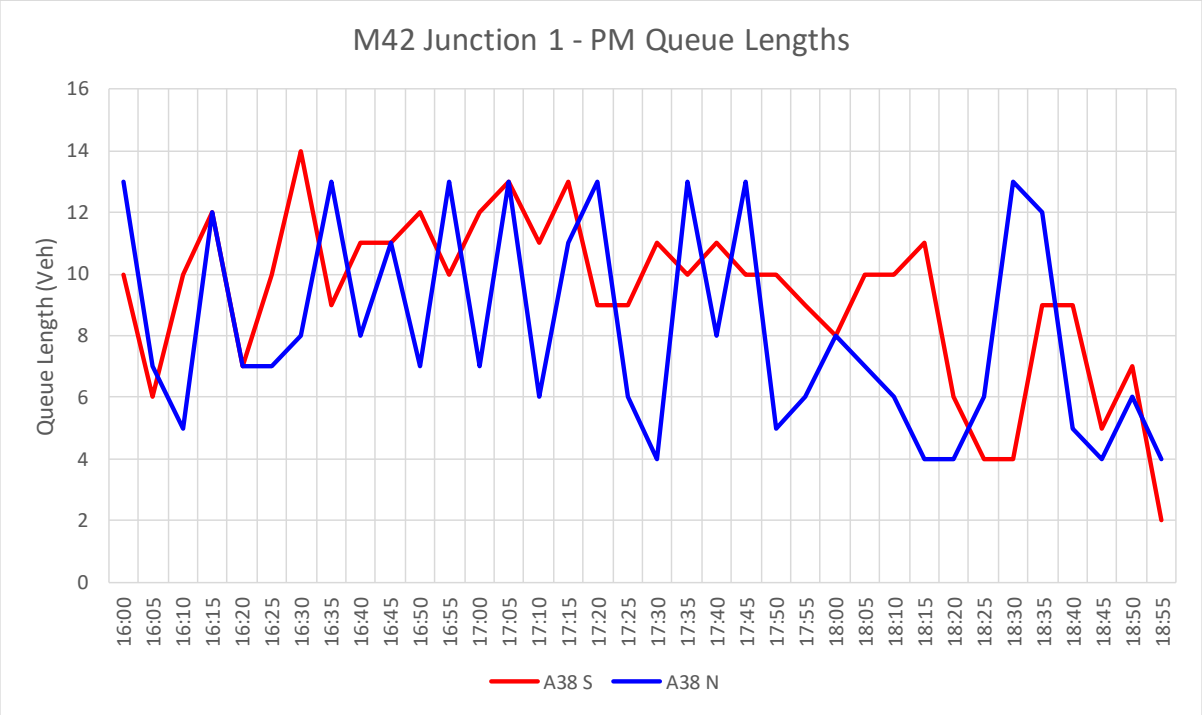


Figure 0.27 - PM Peak Observed Maximum Queue Lengths on A38 NB and SB – A38/Golden Cross Ln/Braces Ln Signalised Junction (June 2017 Survey)

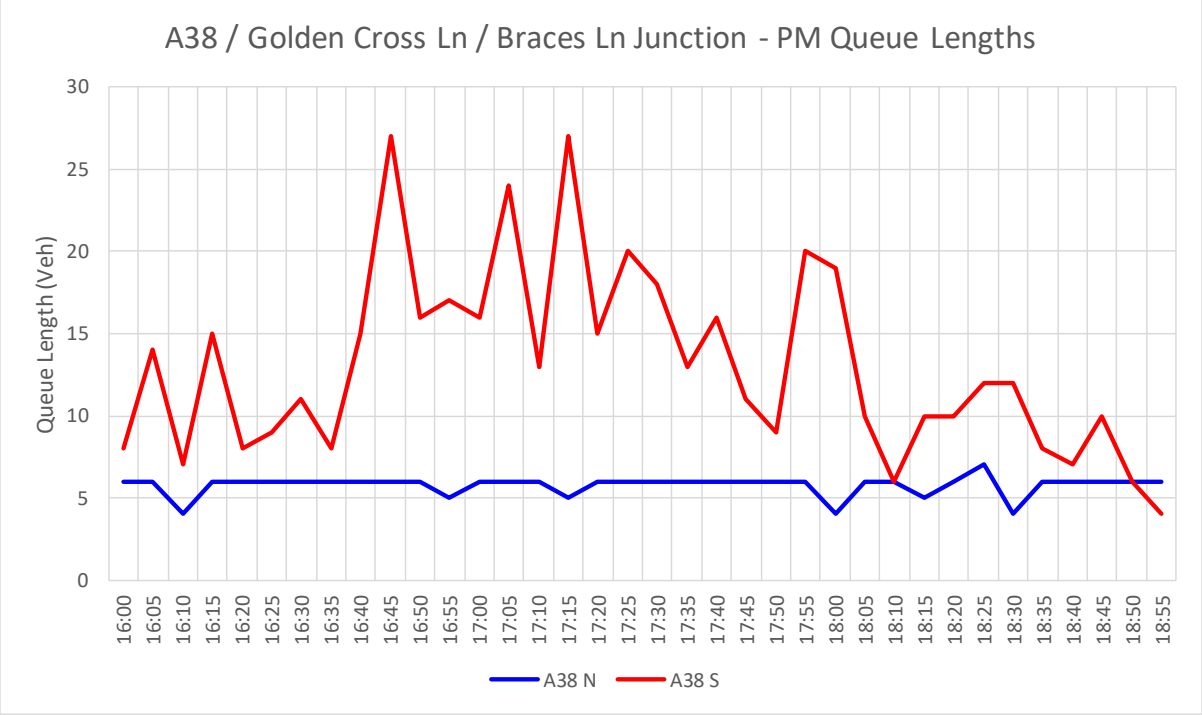
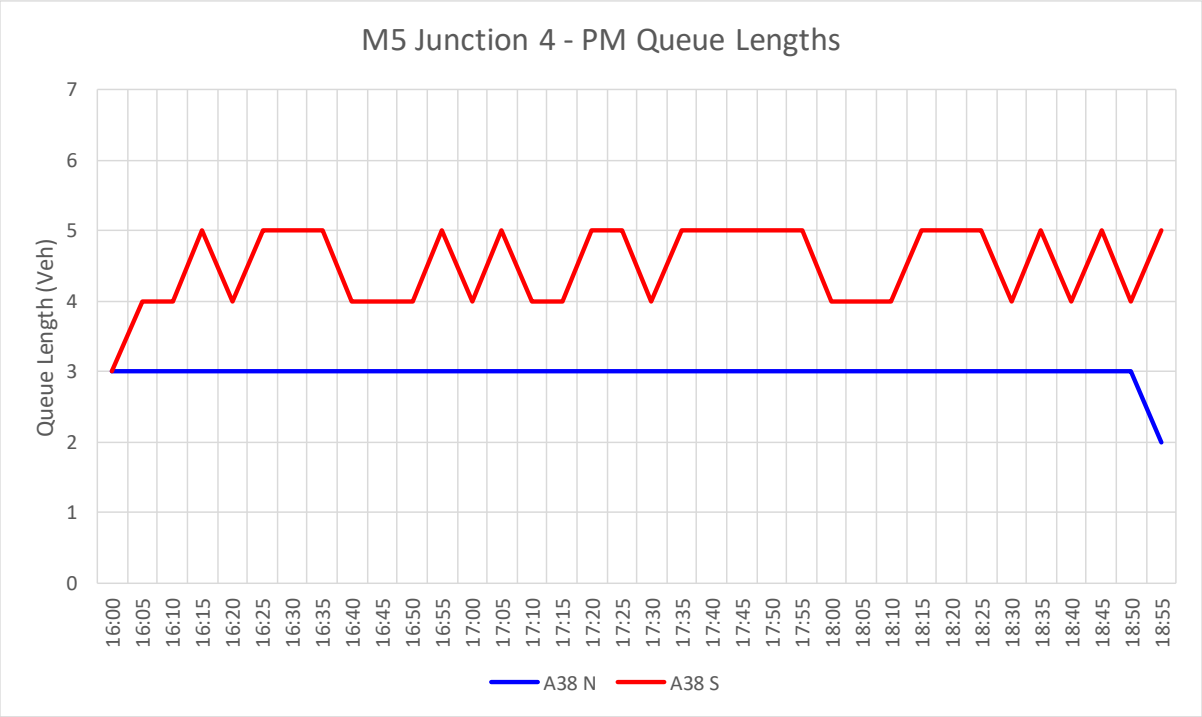


Figure 0.28 - PM Peak Observed Maximum Queue Lengths on A38 NB and SB – M5 Junction 4 Signalised Junction (June 2017 Survey)



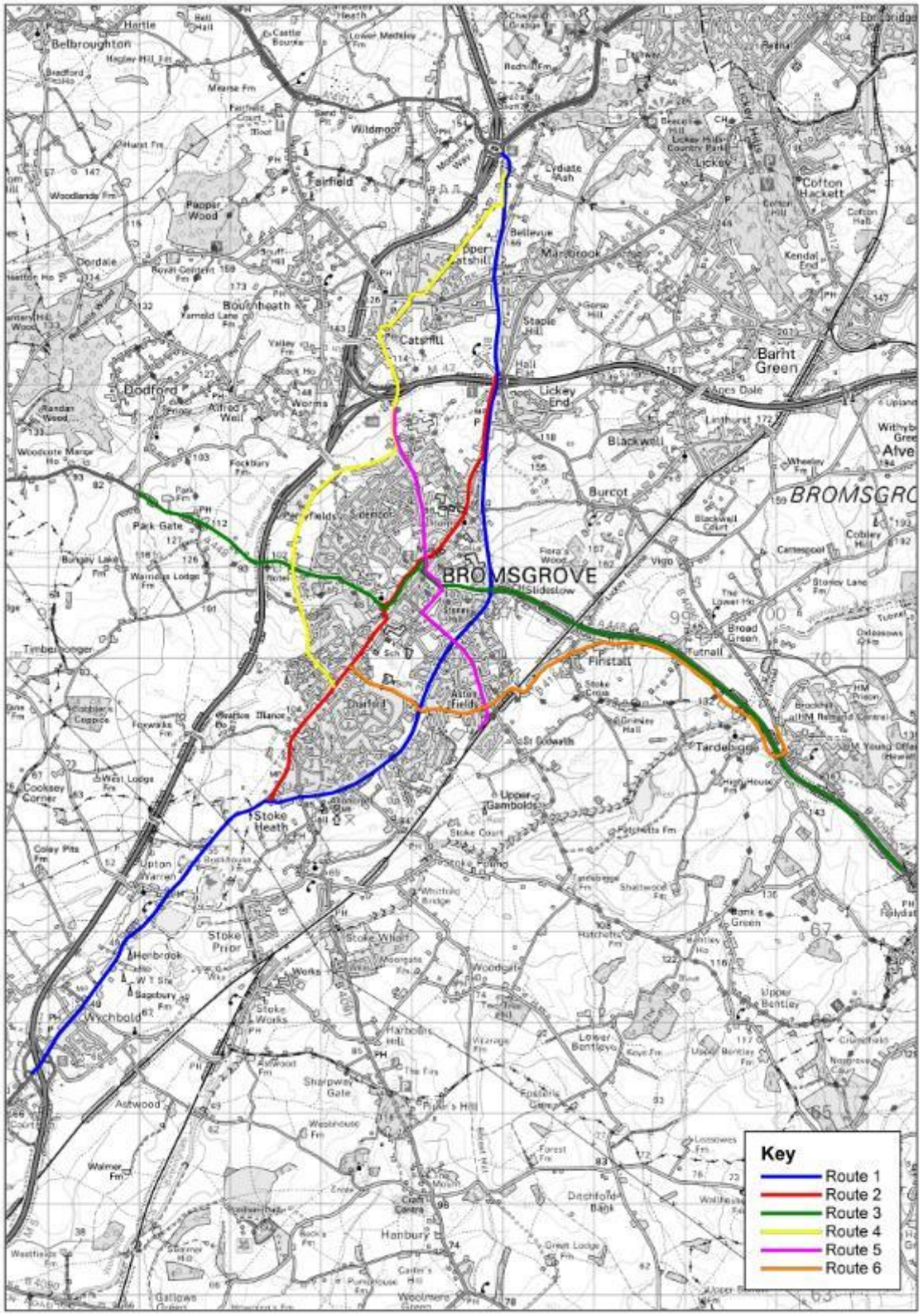
2.4.10 Journey time

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 0.11) and shown in Figure 0.29. 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 0.11 - Journey time 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 Bromsgrove Eastern Bypass junction

Figure 0.29 - 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 0.12.

Table 0.12 - 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 0.30 and Figure 0.31 for Route 1 on the A38, further figures for other routes are contained in Appendix F of the Traffic Data Collection Report.

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.

- 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; and
- 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 0.30 - Cumulative journey times on the A38 corridor, taken from June 2017 journey time surveys (Northbound)

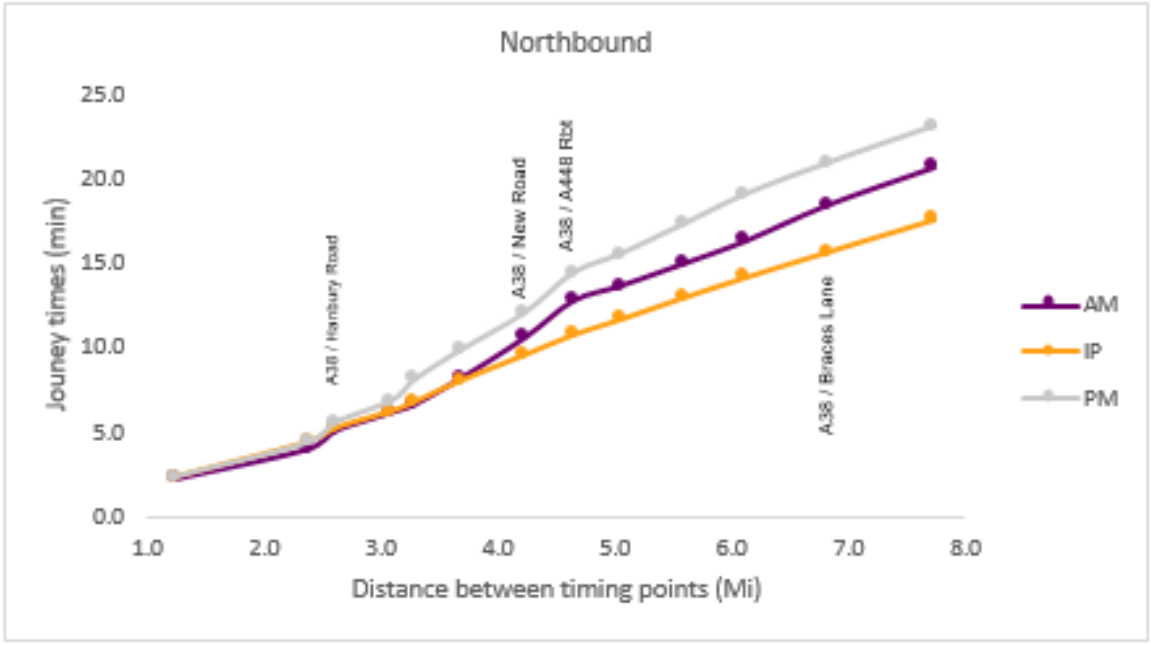
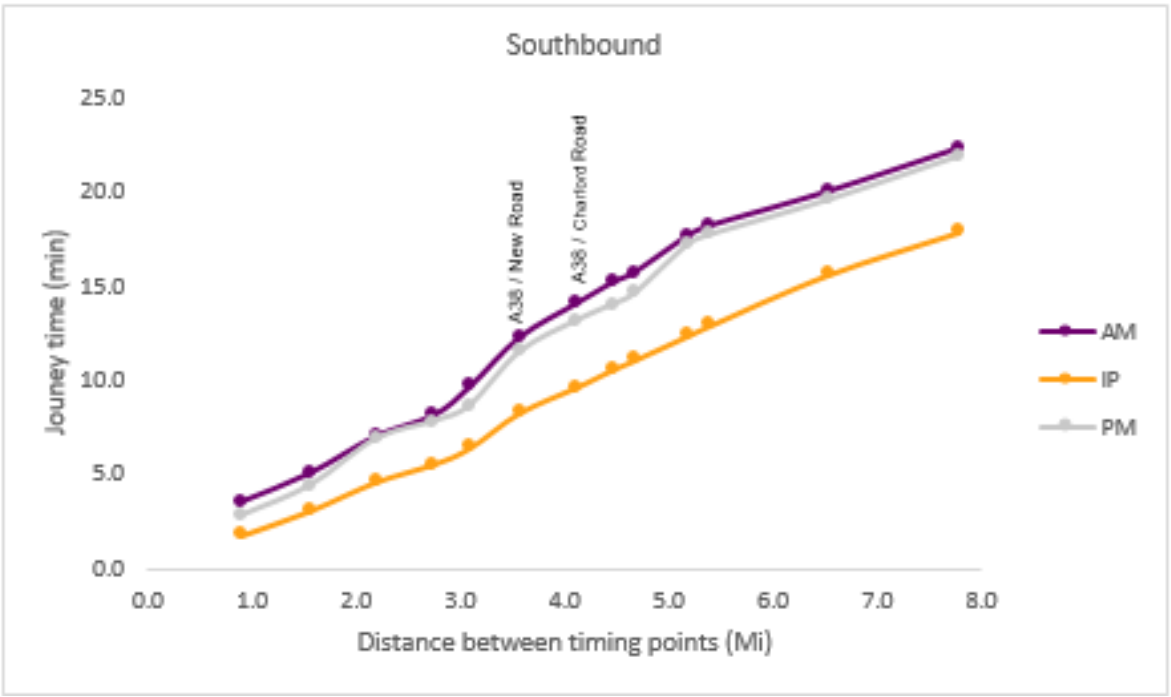


Figure 0.31 - Cumulative journey times on the A38 corridor, taken from June 2017 journey time surveys (Southbound)



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 of with Hanbury Road, with more than 25 vehicles during parts of the morning peak.

On the A38 northbound at the junction of 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.

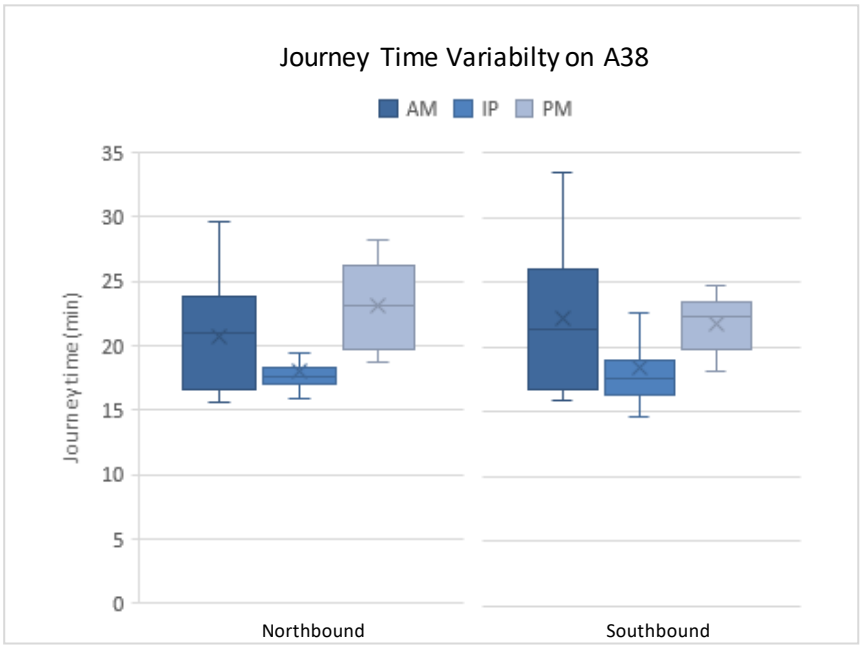
These factors all indicate that the high demand is exceeding capacity, which is resulting in high levels of congestion.

2.4.11 Reliability and resilience

The journey time surveys undertaken in 2017 took samples across the route over two days. This data, shown in Figure 0.32, 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 0.32 – Box plot showing variability of 2017 journey time survey



Current levels of congestion and poor journey time reliability mean 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 0.13.

Table 0.13 – Statistical Analysis – Route 1 Journey Time Data

Route	Route 1 NB	Route 1 NB	Route 1 NB	Route 1 SB	Route 1 SB	Route 1 SB
Time	**AM**	**IP**	**PM**	**AM**	**IP**	**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 rather than the A38 Eastern Bypass if journey times are less reliable than the local routes, leading to an increase of traffic using non strategic routes for strategic journeys. As with congestion, these issues also affect labour markets.

2.4.12 A38 as a Strategic Road Network Diversion route

This section sets out information that has been received from National Highways (NH) (previously called Highways England) 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.

2.4.13 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 0.33 and Table 0.14, and it refers to the number of collisions occurred on M5 and M42 during planned and unplanned events.

Figure 0.33 - Motorway Collisions (M5/M42) (Source: National Highways)

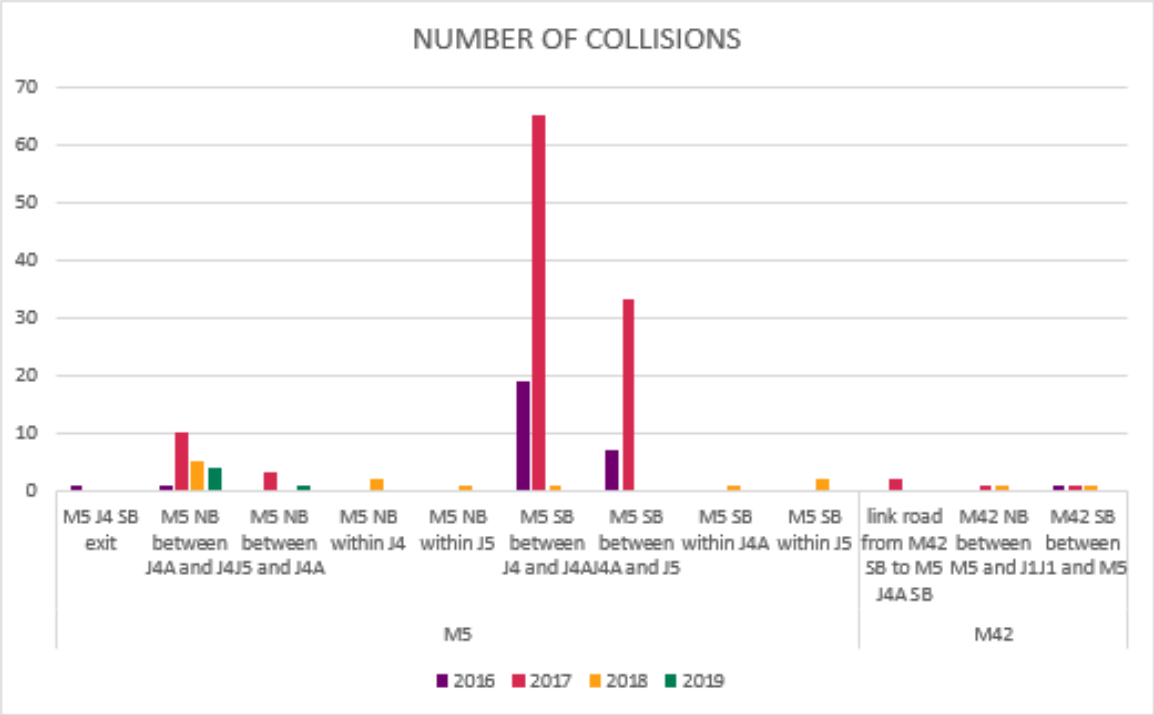


Table 0.14 – Collisions by Year (M42/M5), (Source: National Highways)

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

2.4.14 Planned and Unplanned Closures

Table 0.15 and Table 0.16 show periods of time when either the M5 or M42 motorway experienced a full carriageway closure.

Table 0.15 – M42 Carriageway closures (March 2016 to February 2021)

M42 FULL CARRIAGEWAY CLOSURE				
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
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 0.16 – M5 Carriageway Closures (March 2016 to February 2021)

M5 FULL CARRIAGEWAY CLOSURE

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 smart motorway narrow lanes	28 weeks	Planned works	Affecting M5 Junction 4, 4a & 5 and M42 SB link to M5 SB
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, in reviewing an early draft of the OBC, 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.

2.4.15 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, 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 Route 2, 3, 4 and 5 are set out in Table 0.17 to Table 0.20.

Table 0.17 – Statistical Analysis – Route 2 Journey Time Data

	Route 2 NB	Route 2 NB	Route 2 NB	Route 2 SB	Route 2 SB	Route 2 SB
	AM	IP	PM	AM	IP	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 0.18 – Statistical Analysis – Route 3 Journey Time Data

	Route 3 NB	Route 3 NB	Route 3 NB	Route 3 SB	Route 3 SB	Route 3 SB
	AM	IP	PM	AM	IP	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 0.19 – Statistical Analysis – Route 4 Journey Time Data

	Route 4 NB	Route 4 NB	Route 4 NB	Route 4 SB	Route 4 SB	Route 4 SB
	AM	IP	PM	AM	IP	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 0.20 – Statistical Analysis – Route 5 Journey Time Data

	Route 5 NB	Route 5 NB	Route 5 NB	Route 5 SB	Route 5 SB	Route 5 SB
	AM	IP	PM	AM	IP	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 0.34 to Figure 0.36 show the level of flows in 2017 operating on the main routes through Bromsgrove.

Strategic Case

Figure 0.34 - AM Peak Base Year Flow (veh/hr)

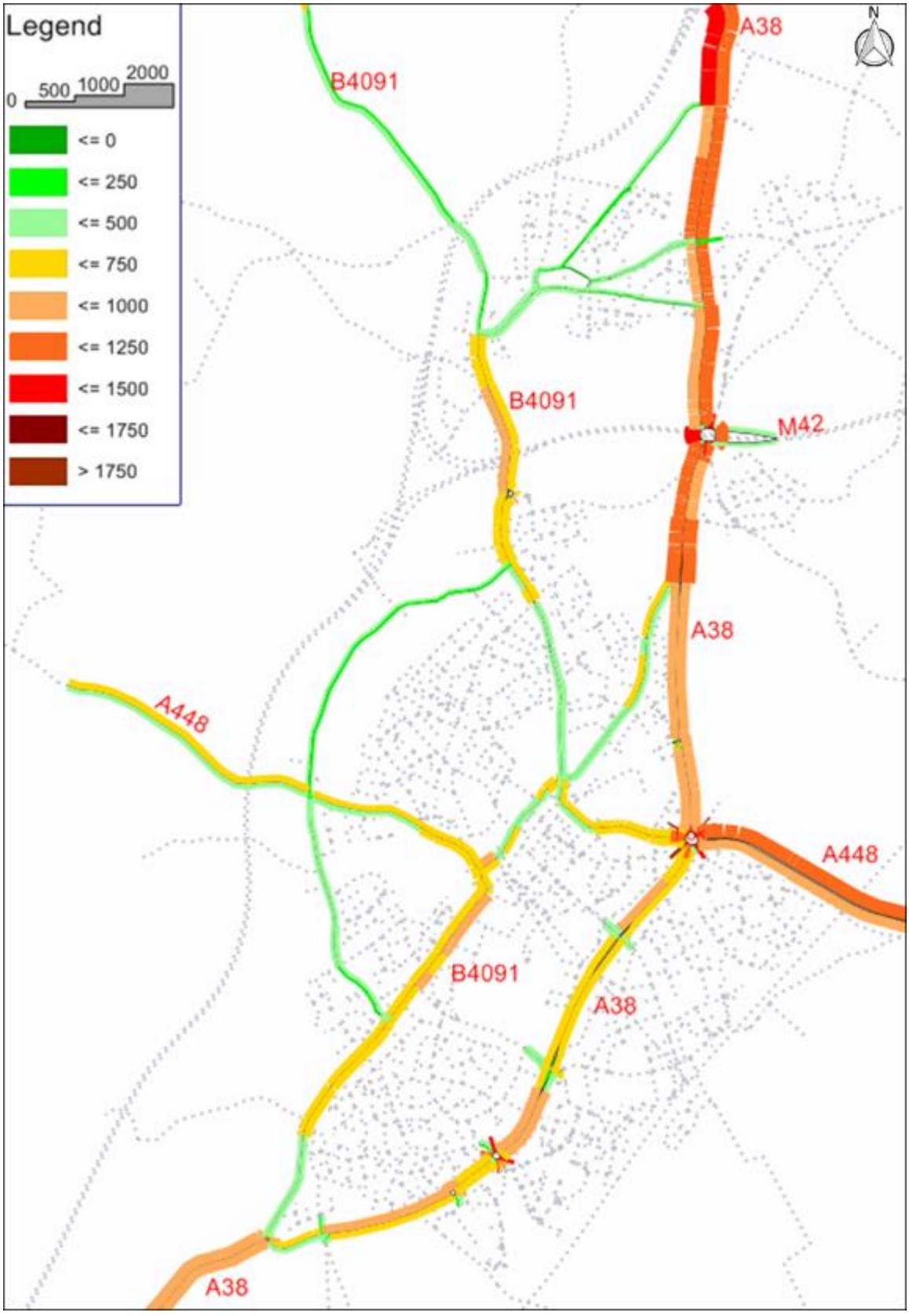
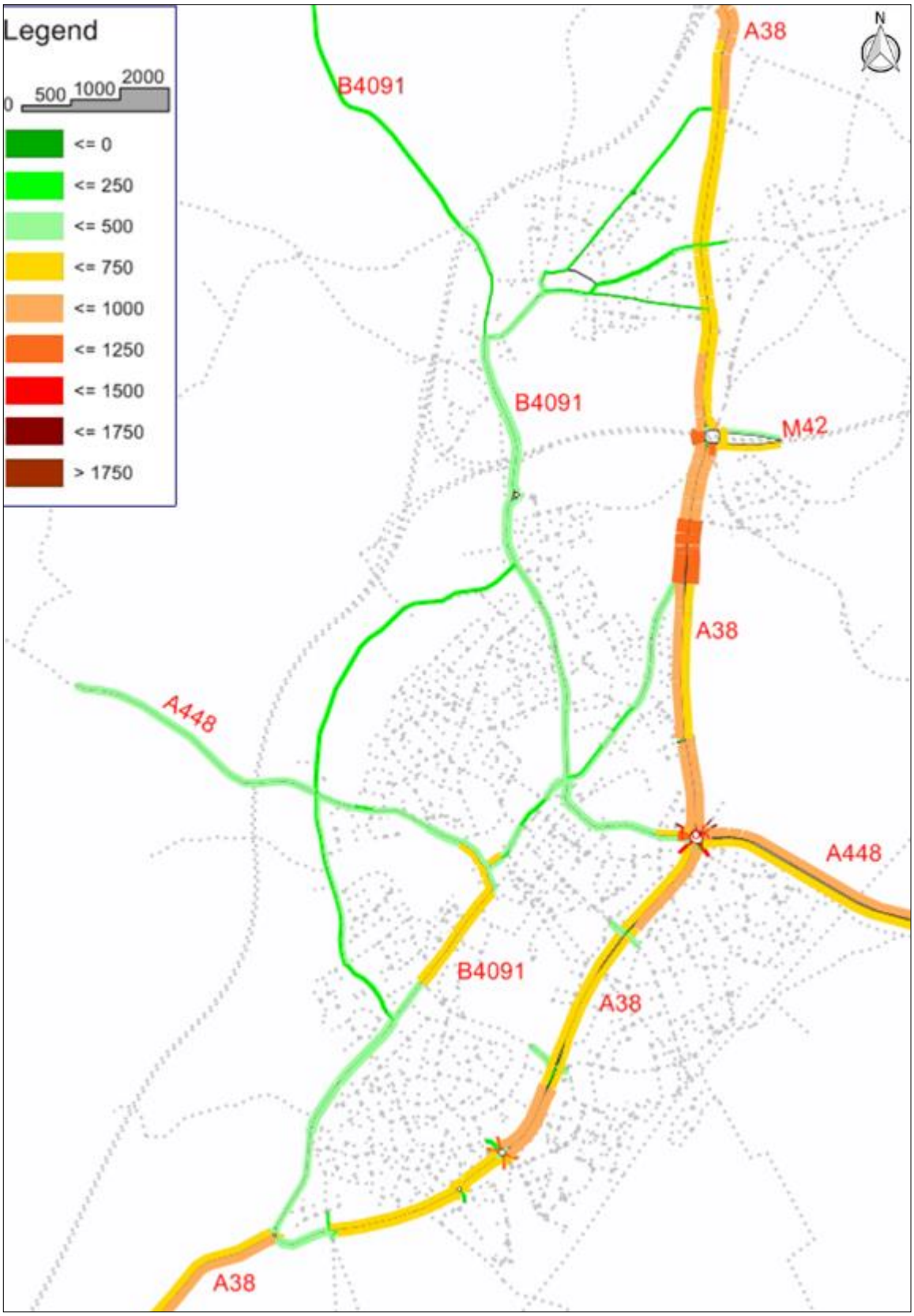
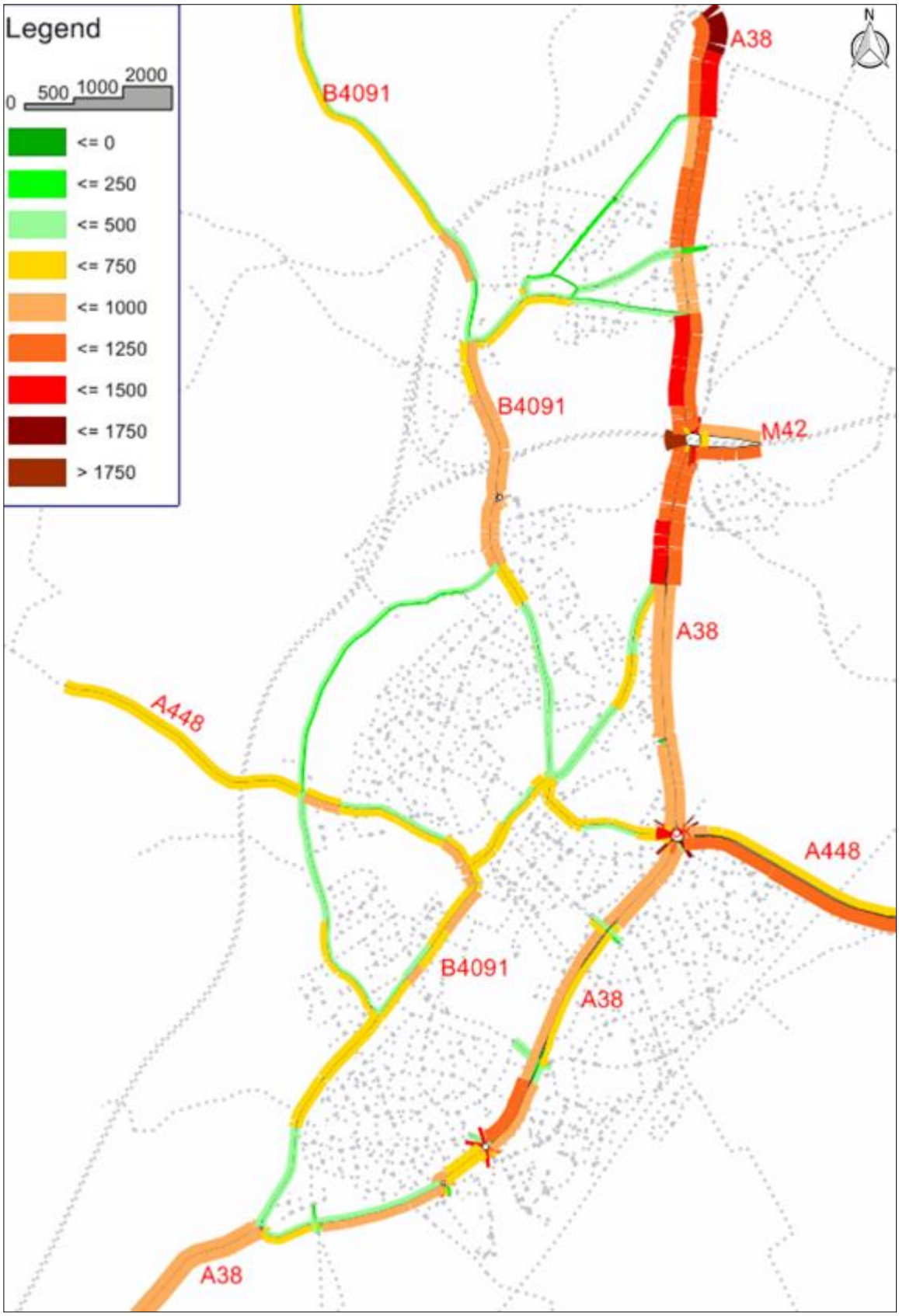


Figure 0.35 - Inter Peak Base Year Flow (veh/hr)



Strategic Case

Figure 0.36 - PM Peak Base Year Flow (veh/hr)



2.4.16 Existing Pedestrian and Cyclist conditions

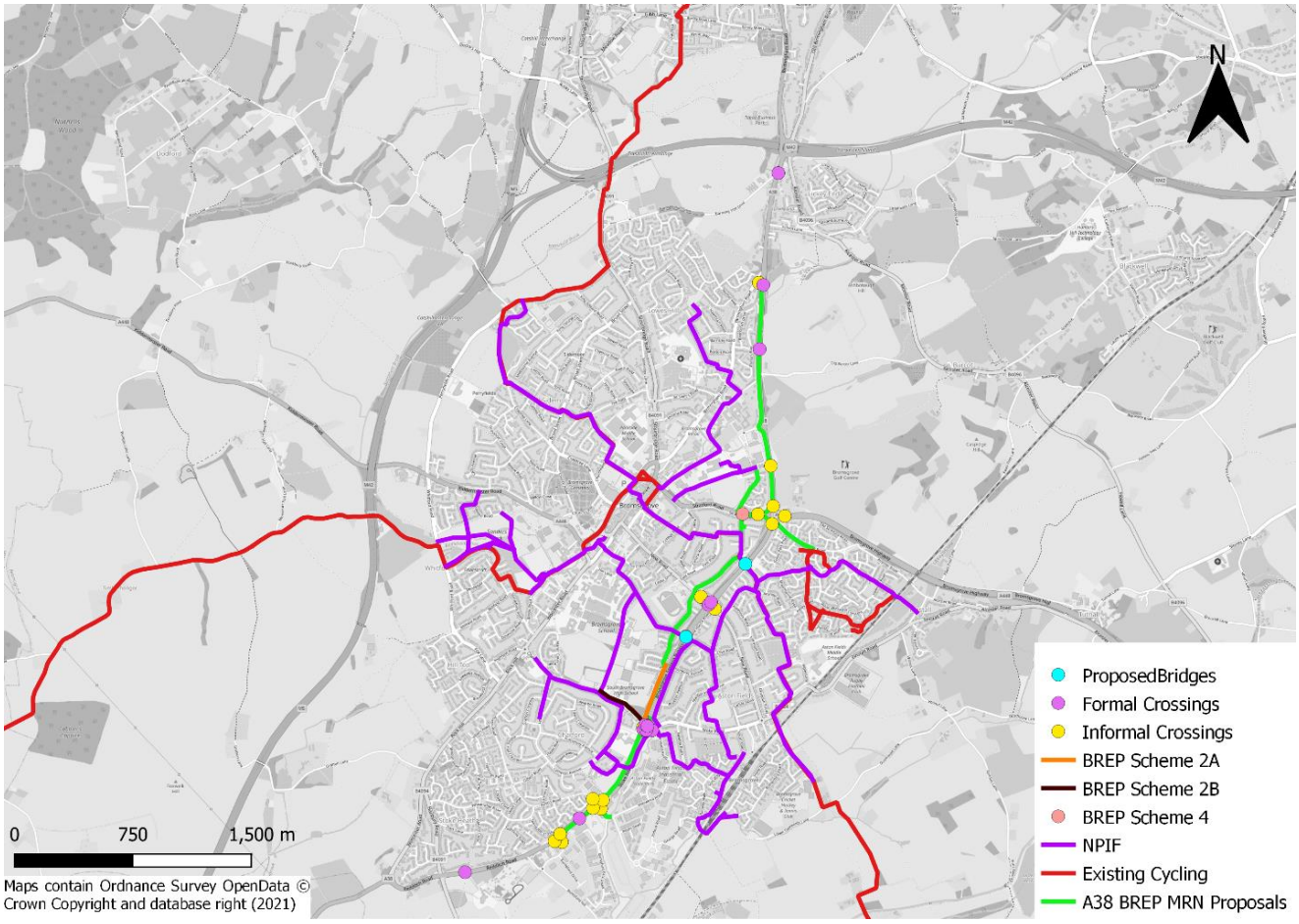
2.4.17 Pedestrian Infrastructure – Existing Network

Within the A38 corridor there are two main issues around pedestrian provision. The first issue is that no footway exists alongside or adjacent to the route (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 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 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 0.37), 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 0.37 – 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 0.38), the crossing is located on a section of road that is busy with high speeds and located at the end of a two lane merge to a single lane on exiting from New Road signals. The merge is currently lightly used, but occasionally vehicles use it as an overtaking section. In the future. It would be harder to cross at this location due to the increase in traffic flows projected in 2040, thus presenting either more deterrence of trips or increasing the chance of collisions with vulnerable users.

Figure 0.38 - Existing crossing location south of New Road junction

Figure 0.39 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 0.39 - 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 0.40 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 0.40 – New Road Signals – A38 Crossing provision on route between station and town centre

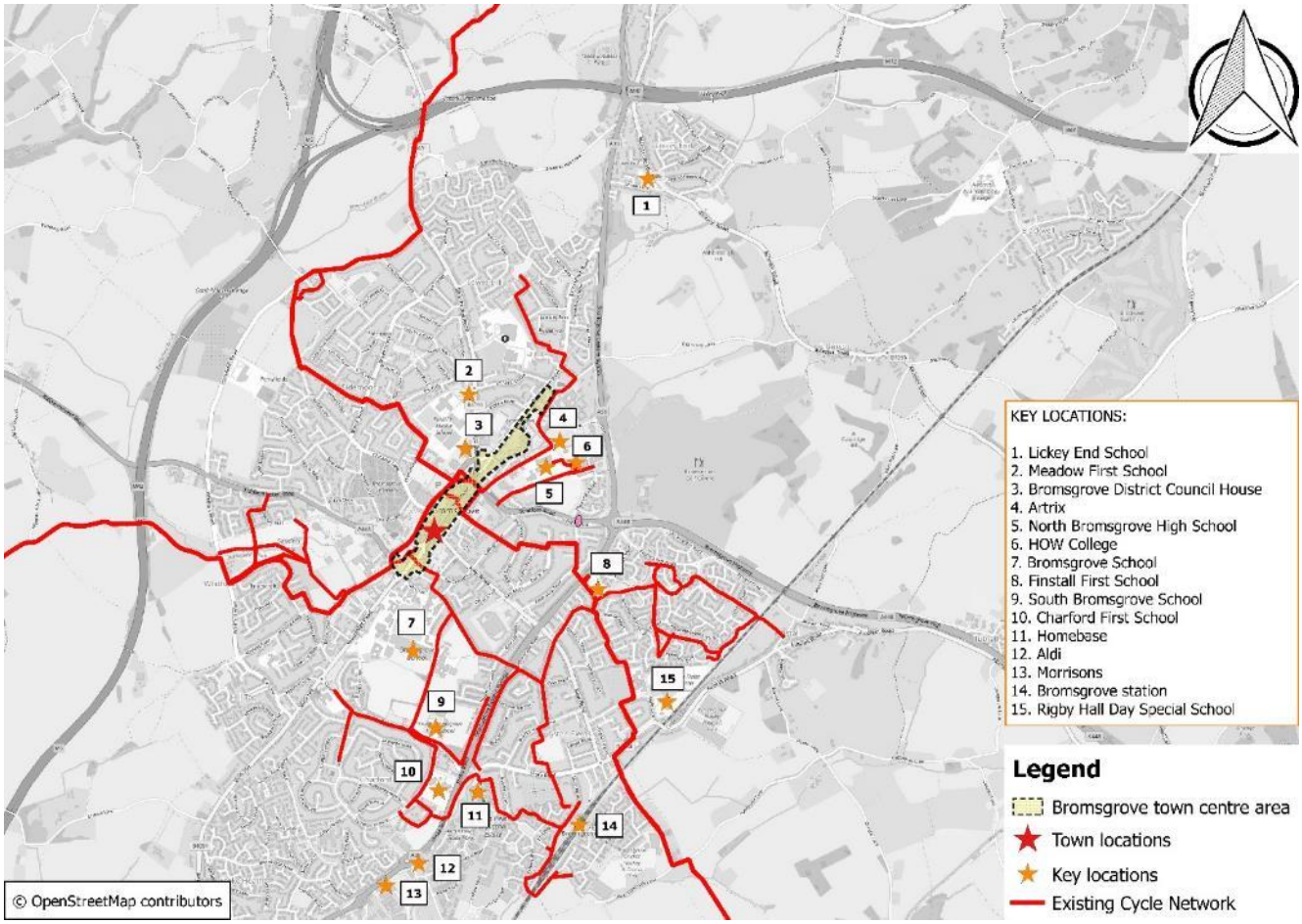
Cycle Infrastructure – Existing Network

The existing cycle network is shown on Figure 0.41. 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.

As can be seen in the 2011 census data in section 2.4.6, 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.

Figure 0.41 - 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.

Pedestrian and Cycle Usage

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 0.21. The survey locations are demonstrated in Figure 0.42.

Table 0.21 – Average Weekday Pedestrian / Cycle count crossing data (07:00 – 19:00)

Location	Pedestrians	Cyclists	Associated Scheme
A38 / Buntsford Drive	198	0	B
A38 / Austin Road / Sherwood Road	435	20	B
A38 /Stoke Road / Charford Road	1402	26	C
A38 / Old Station Road / Stonehouse Road Footpath	152	7	3
A38 / New Road	466	14	D
A38 / Carnforth Road Bridge	234	25	5
A38 / A448	173	12	E/6/1
A38 / Birmingham Road	166	9	F/1
A38 / School Lane (Crossing A38)	5	0	F
A38 / School Lane (Crossing School Lane)	9	0	F
A38 / Braces Lane / Golden Cross Road	94	4	G
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[1] 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, included high volumes and high speeds of traffic on the A38 corridor in particular. Further the survey was undertaken in cold weather conditions, which may further have deterred use.

[1] https://www.metoffice.gov.uk/weather/warnings-and-advice/uk-storm-centre/storm-ciara

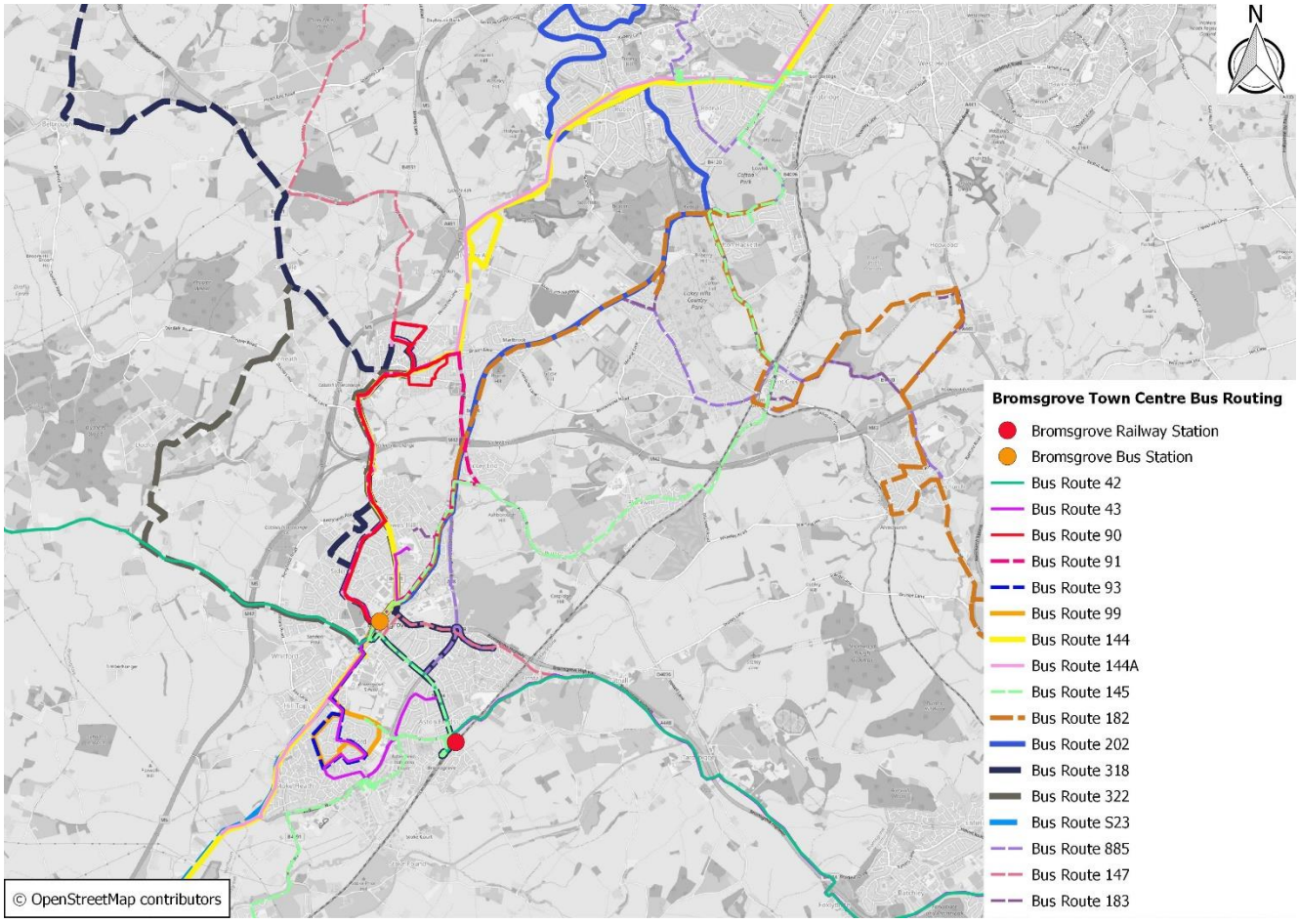
Figure 0.42 Location of pedestrian and cycle surveys, February 2020

2.4.18 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 0.43 shows the routing of all bus routes in Bromsgrove. Bus routes present as dashed lines operate once an hour or less frequently. Table 0.22 and Table 0.23 then outline further detail on the operating network.

Figure 0.43 – 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 railway station, to the south east of the town. Bus routes presented on Figure 0.43 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.

Patronage Data

Worcestershire County Council have been able to obtain limited patronage data from operators on some of the subsidised routes, this data is set out below:

Table 0.22 – 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 0.23 – 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 PT mode share in Bromsgrove.

Overall, it is anticipated that bus services will benefit from measures to reduce queuing at junctions. As part of the OBC development, further work has been undertaken to consider whether additional measures to assist buses (for example select vehicle detection) could be provided at key junctions in line with the strategic case key elements such as linkages between the station and town centre which cross the A38.

Table 0.24 - 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
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 0.25 - 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

Rail Network & 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 is not easy. 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.

2.4.19 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. Fatalities 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; and
  - Failed to judge other persons path or speed.
- Rear shunt collisions are common at the A38/A448 Roundabout.

Figure 0.44 shows the collisions that occurred on the A38 corridor within the five-year period (2015-2020) split by severity level.

Figure 0.44 - Five-year period collision data, February 2015 - January 2020

Table 0.26 shows the number of collisions and KSI ratio at the main junctions on the A38 corridor, Table 0.27 sets out the causation for collisions at key locations on the A38 for the five-year period.

Table 0.26 – A38 Collisions and KSI Ratio by junction

Number of collisions at the main A38 junctions
Feb 2015 - January 2020

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 0.27 - Causation factors by location, February 2015 to January 2020 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 0.28 shows the locations on the A38 corridor in which vulnerable user collisions have occurred.

Table 0.28 - Collisions involving vulnerable road users, February 2015 - January 2020

Junction	Vulnerable User Pedestrians	Vulnerable User 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.

2.4.20 Other considerations on the A38 corridor

2.4.20.1 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 45.7 µg/m3, but this has now reduced to 30.8 µg/m3.
- 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 45.6 µg/m3, but this has now reduced to 33.1 µg/m3.

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 nursery, 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.

An updated air quality assessment will be undertaken for the cumulative schemes. The scope of the updated assessments will be informed by the traffic model, the development of detailed design, the outcome of this screening opinion request and consultation with WRS. A Construction Environmental

Management Plan (CEMP) will be produced to supplement the management of environmental receptors and mitigation of effects during construction.

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 that due to improvements in the vehicle fleet that the exceedance improves. Therefore, the development of the A38 scheme will need to take account of the AQMAs. Works within these areas may require ongoing discussion with Worcestershire Regulatory Services and/or specific assessment or consenting approaches.

2.4.20.2 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. Assessment of the impact of the scheme on noise levels is therefore important.

Noise Important Areas (NIAs) are:

- ID7641, 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; and
- 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.

Further assessment is required to understand the likely impacts of the final cumulative scheme on noise and vibration receptors during operation and to determine the locations of noise barriers and low noise surfacing. Works within these areas will require ongoing discussion with Worcestershire Regulatory Services and/or specific assessment or consenting approaches to be applied. An updated noise assessment will be undertaken for the cumulative scheme.

2.4.20.3 Other environmental issues

In addition to noise and air quality, other environmental issues which are important to consider include:

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. There are no National Parks or Areas of Outstanding Natural Beauty (AONB) located within 2km 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 directly within the boundary of Schemes C and 2A.

Species surveys have been undertaken at the appropriate survey times. These are detailed in full within the Ecological Appraisal and accompanying Habitat Plans.

Further assessment is required to understand the ecological impacts of the scheme on biodiversity. An updated ecological appraisal will be undertaken for the cumulative scheme. A CEMP will be produced to supplement the management of environmental receptors and mitigation of effects during construction of the cumulative scheme.

Water and Drainage

There are a number of water bodies in the vicinity of the corridor including the Spadesbourne Brook, which is classified as a Main River as designated by the Environment Agency, as well as the Sugar Brook and the Marl Brook. 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:

- Between Austin Road roundabout and Charford Road the A38 is known to flood on a regular basis, the nature of the problem is not fully understood, but as part of the scheme development evaluation is underway to come up with a cost effective solution, such as further attenuation or improved outfalls to local water courses.
- In the vicinity of 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.

Further assessment is required to understand the impacts of the cumulative scheme on the water environment. A Water Environment Assessment (WEA) and associated Flood Risk Assessment (FRA) and Drainage Strategy will be produced for the cumulative scheme. A CEMP will be produced to supplement the management of environmental receptors and mitigation of effects during construction.

Best practice environmental measures based upon the guidance contained in the Environment Agency's Pollution Prevention Guidelines (PPGs) should be incorporated into the CEMP and implemented so that no detriment occurs to water bodies connected to the cumulative scheme.

Where applicable environmental permits will be required from the Environment Agency to ensure that the works do not increase flood risk (within the scheme extents or elsewhere) or harm the environment. Construction method statements and drainage strategy will need to be prepared to support the works. The construction method statement will also be prepared, detailing pollution prevention measures to be employed on site throughout the construction period to minimise the risk of accidental impacts on the water environment.

The scheme's CEMP will include measures to prevent pollution during construction following relevant CIRIA and EA guidance.

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.

A number of the trees along the route are subject to Tree Preservation Orders (TPO's) and are therefore afforded protection to prohibit any cutting down, topping, lopping uprooting, wilful damage or wilful of these trees (and roots) without written consent from the local planning authority.

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.

Some of the schemes (Schemes A and E) are located adjacent to Biodiversity Action Plan (BAP) priority habitats and National Forest Inventory woodland.

In addition, there are several trees, groups or areas of trees within the extents of the cumulative scheme, or immediately adjacent to the cumulative scheme boundary, that are subject to a TPO. These include:

- 4 lime trees and 1 Horse Chestnut Tree as part of a TPO group, located approximately 10m south of Scheme A at the closest point;
- 1 TPO area partly located in a mixed area of trees, as well as 5 Silver Birch, 4 multi-stemmed Willows, 2 Oak, 2 Cherry, 1 Maple, 1 Ash, 1 Lime and 1 Silver Maple trees located approximately 10m south of Scheme B at the closest point; and
- 6 Red Oak Trees attached to land associated with fast food restaurant approximately 5m south of Scheme C at the closest point.

Should works to or removal of TPO trees be required, permission must be granted by Bromsgrove District Council in advance of any works; together with landowner consent. More information on these features can be found within Tree Survey Report and the locations of these trees are in the appended Tree Plans.

Further appraisal or assessment is required to understand the visual impacts of the scheme on the landscape and townscape and the mitigation required to address the impacts. In particular, Scheme 3 and Scheme 5 will require detailed assessment and design.

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.

A Historic Environment Records (HER) search will be completed for the cumulative scheme in consultation with the LPA, to determine whether further assessment is required. A Cultural Heritage Appraisal will be produced for each package of works.

2.4.21 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 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.
- Drainage issues exist between Charford Road and Austin Road, and in the vicinity of the The Tryst junctions, resulting in flooding of the carriageway.

2.4.22 Future problems and challenges

This chapter of the OBC sets out the forecast issues in 2025 and 2040 scenarios as defined by the outputs from the strategic VISUM modelling.

2.4.23 Future housing and employment growth

Pressure on the A38 corridor will increase in the future as sites allocated in both the Bromsgrove and Redditch 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 A38 Bromsgrove Traffic Forecasting Technical Note).

- 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 Hagley, Catshill, Alvechurch, Barnt Green and Wythall. Many of these sites are now consented.

- 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 the remaining 2,300 would be subject to a Green Belt review and then allocated within a Local Plan Review. Subject to the ongoing Local Plan review, the scheme may further support delivery of additional homes and employment land. This review is intended to be completed by 2023.
- The Local Plan review will also identify development allocations for growth targets 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. The review remains underway and is at too early a stage to influence this OBC.
- 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 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 Foxlyidate is particularly relevant to the A38.
- In addition there are further allocations within the Redditch Local Plan (and sited within Redditch itself).
- The Infrastructure Delivery Plans for both Redditch and Bromsgrove 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 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 0.29 shows key development sites in the vicinity of the A38 identified within the adopted 2017 plans. It highlights the status of each site. The quantum of proposed development within the adopted 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 planning individual development site currently has obligations that restrict development in advance of delivery of the A38 schemes, there are planning linkages between this scheme and the delivery of allocations identified in existing Local Plans and this is reflected in the requirement for S106 contributions to the BREP 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 Worcestershire County Council 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 Worcestershire County Council 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 limited development prior to the implementation of

elements of the scheme. Going forward Worcestershire County Council has identified the A38 in its current form is a key constraint to additional future development allocations through the District Plan review process.

In summary, the A38 BREP 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. 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 0.29 is 5950 (further details are presented in the Economic Case 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 0.29 - Status of main development sites in vicinity of A38*

Site	Authority	Local Plan allocation	Application status	S106 contribution to BREP	Condition preventing build out of site in advance of BREP
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 Package 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 400 m2 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 associated community infrastructure. A detailed application has been	Yes	No

			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)		296 homes and 3,100 m2 of B1 consented and under construction	No	No
Brockhill East, phase 3	Redditch/Bromsgrove (cross border allocation)		**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.*

2.4.24 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 no scheme option. The modelled traffic volumes along the corridor are shown in Figure 0.45 to Figure 0.48 for the 2025 and 2040 Do Minimum scenarios.

Figure 0.45 - Modelled 2025 traffic volumes – Do Minimum – AM peak

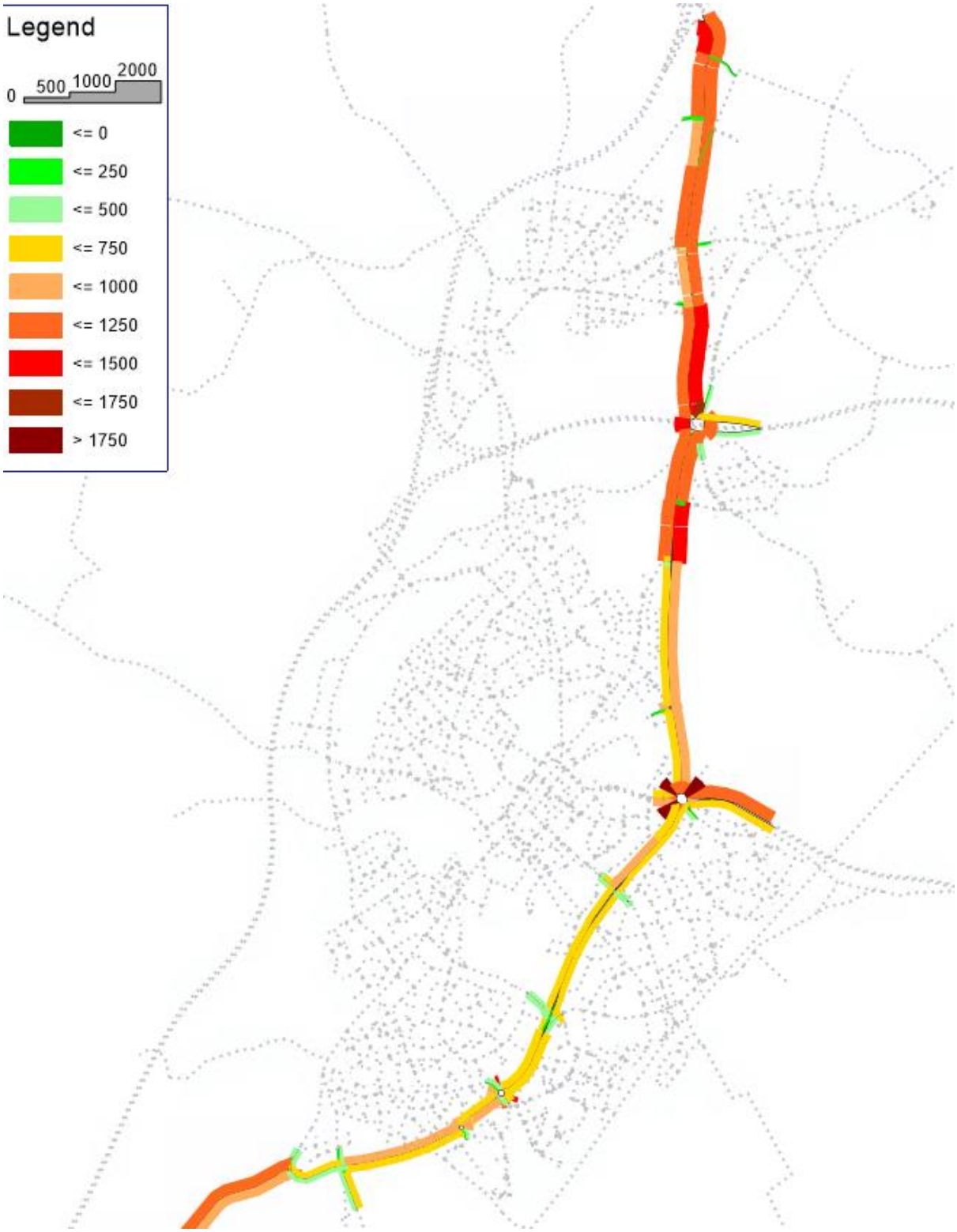


Figure 0.46 - Modelled 2025 traffic volumes – Do Minimum – PM peak

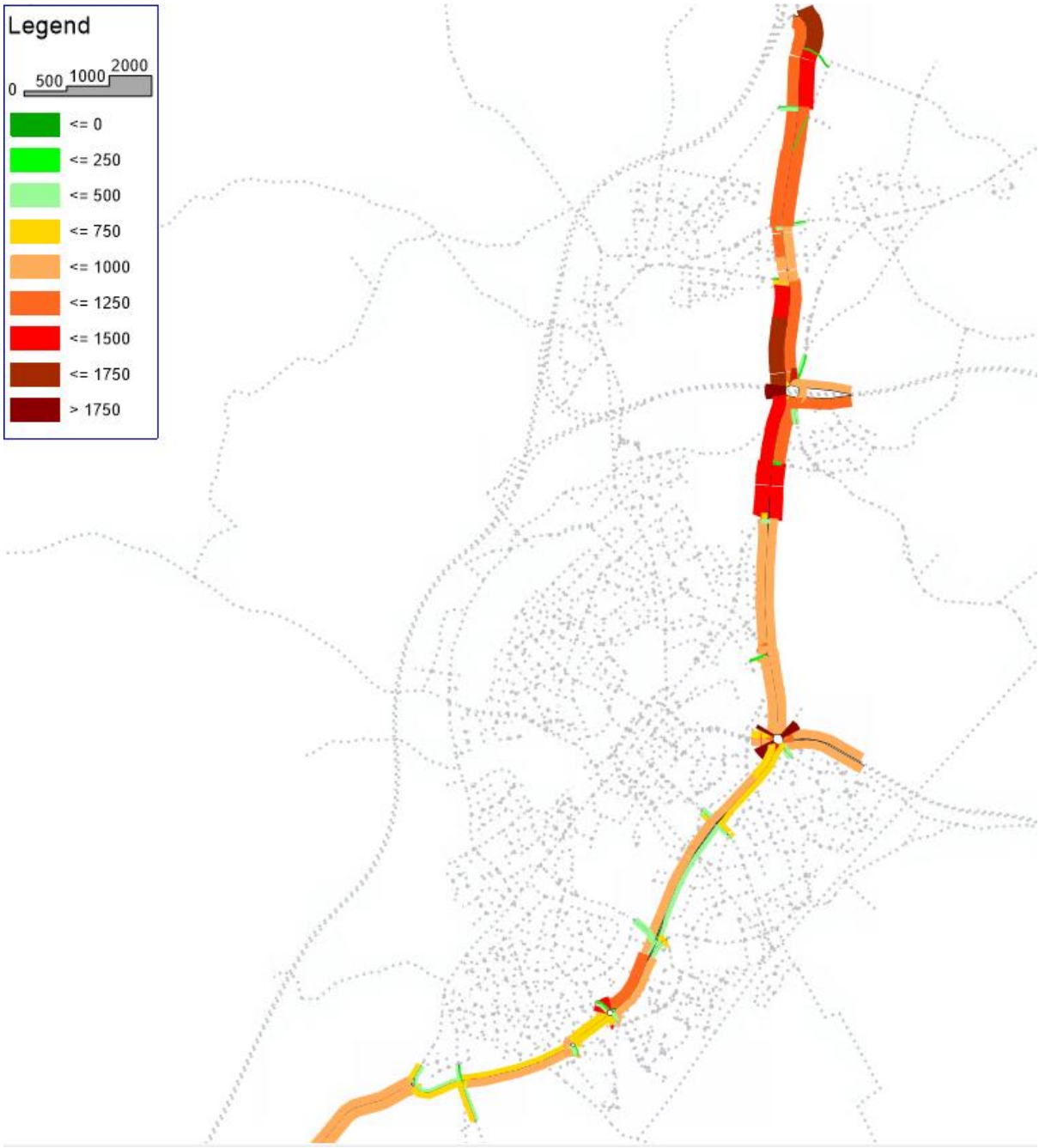


Figure 0.47 - Modelled 2040 traffic volumes – Do Minimum – AM peak

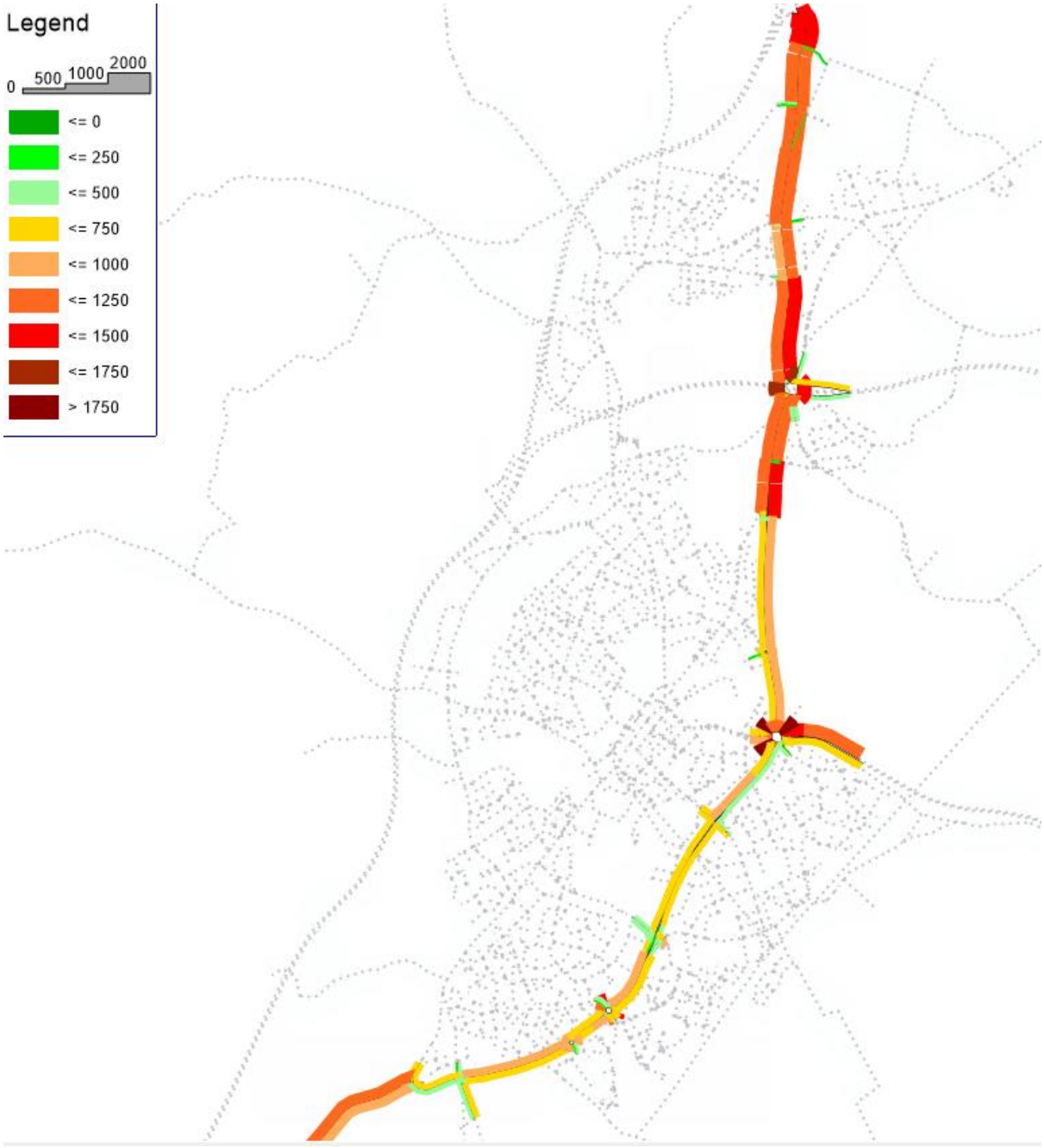
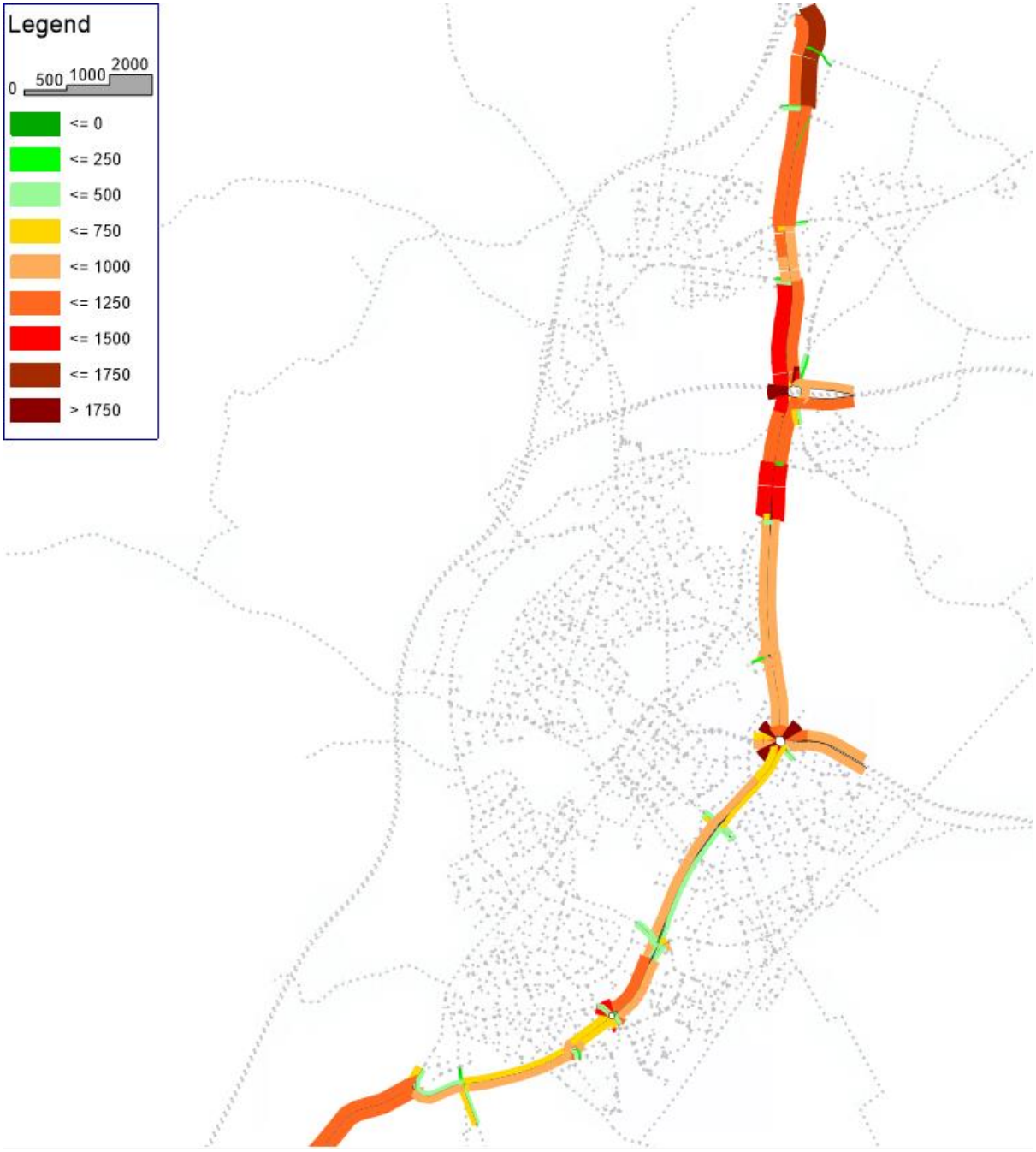


Figure 0.48 - Modelled 2040 traffic volumes – Do Minimum – PM peak



2.4.25 Journey times

The modelled journey times along the corridor are shown in Figure 0.49 to Figure 0.54. Figure 0.49 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 0.50, there is a general increase across the route in both 2025 and 2040 Do Minimum scenarios.

Figure 0.51 and Figure 0.52 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 0.53 and Figure 0.54 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 0.49 – Northbound AM Journey Times from VISUM Model

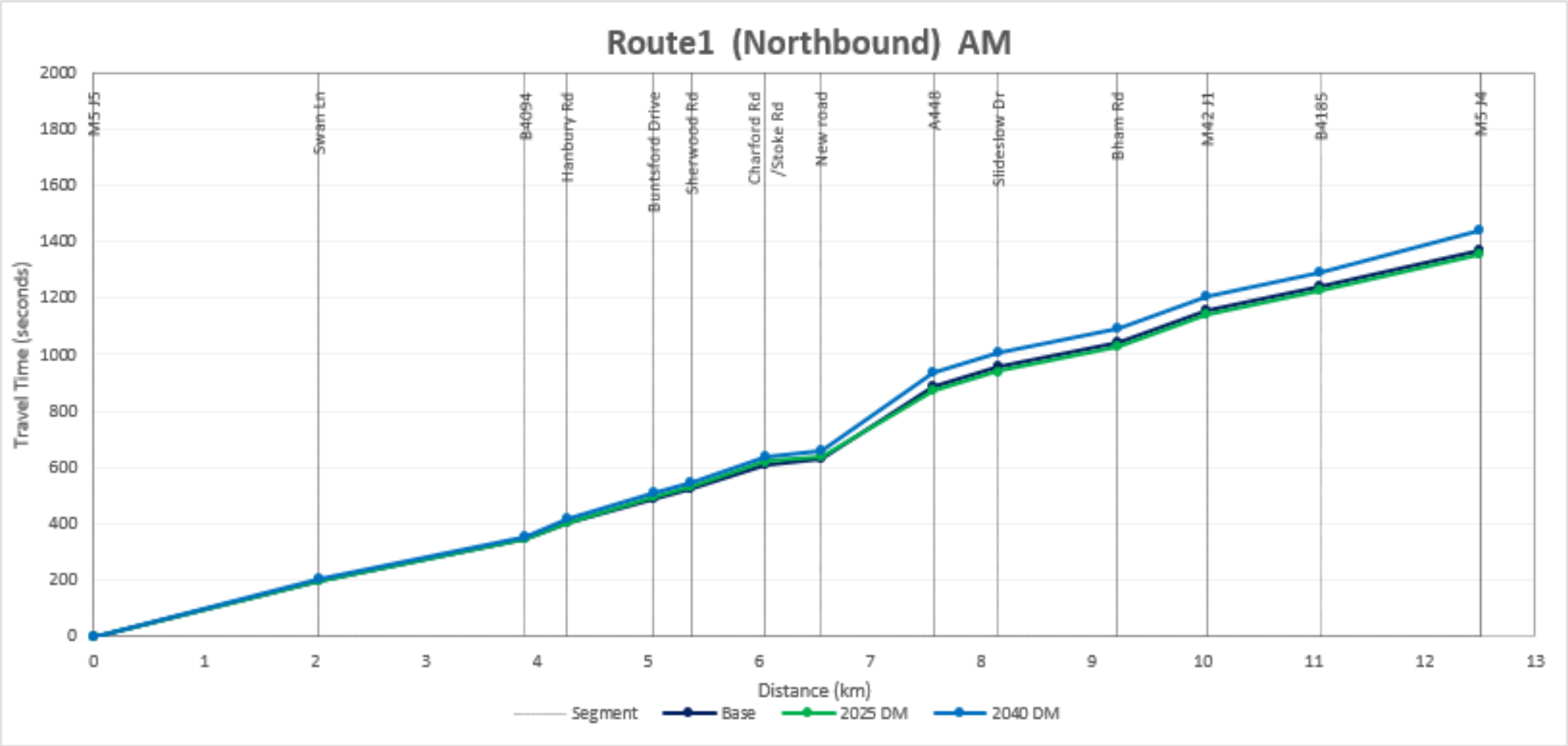


Figure 0.50 – Southbound AM Journey Times from VISUM Model

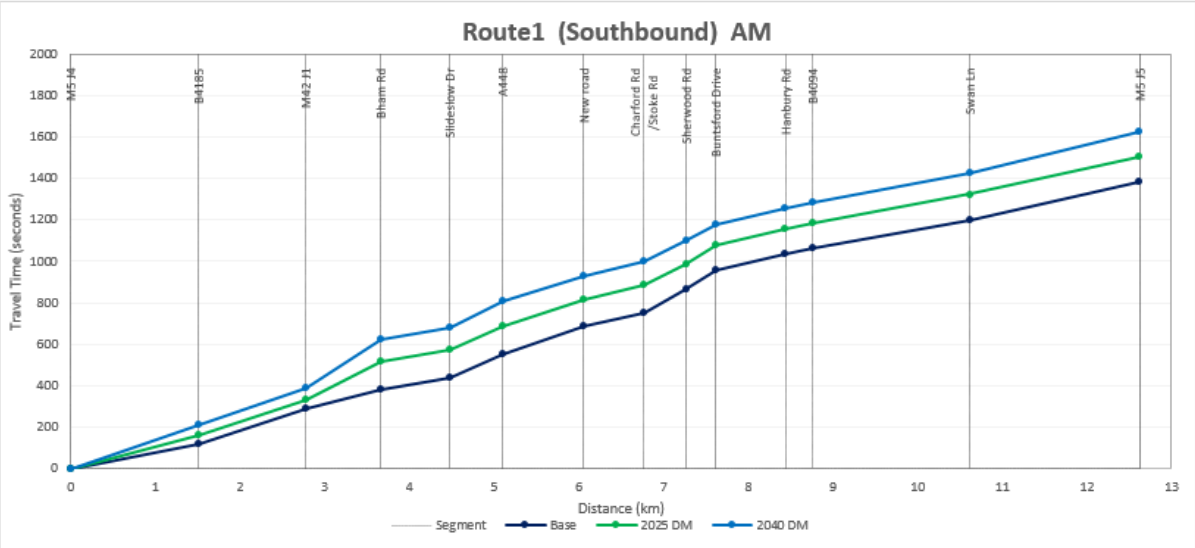


Figure 0.51 – Northbound IP Journey Times from VISUM Model

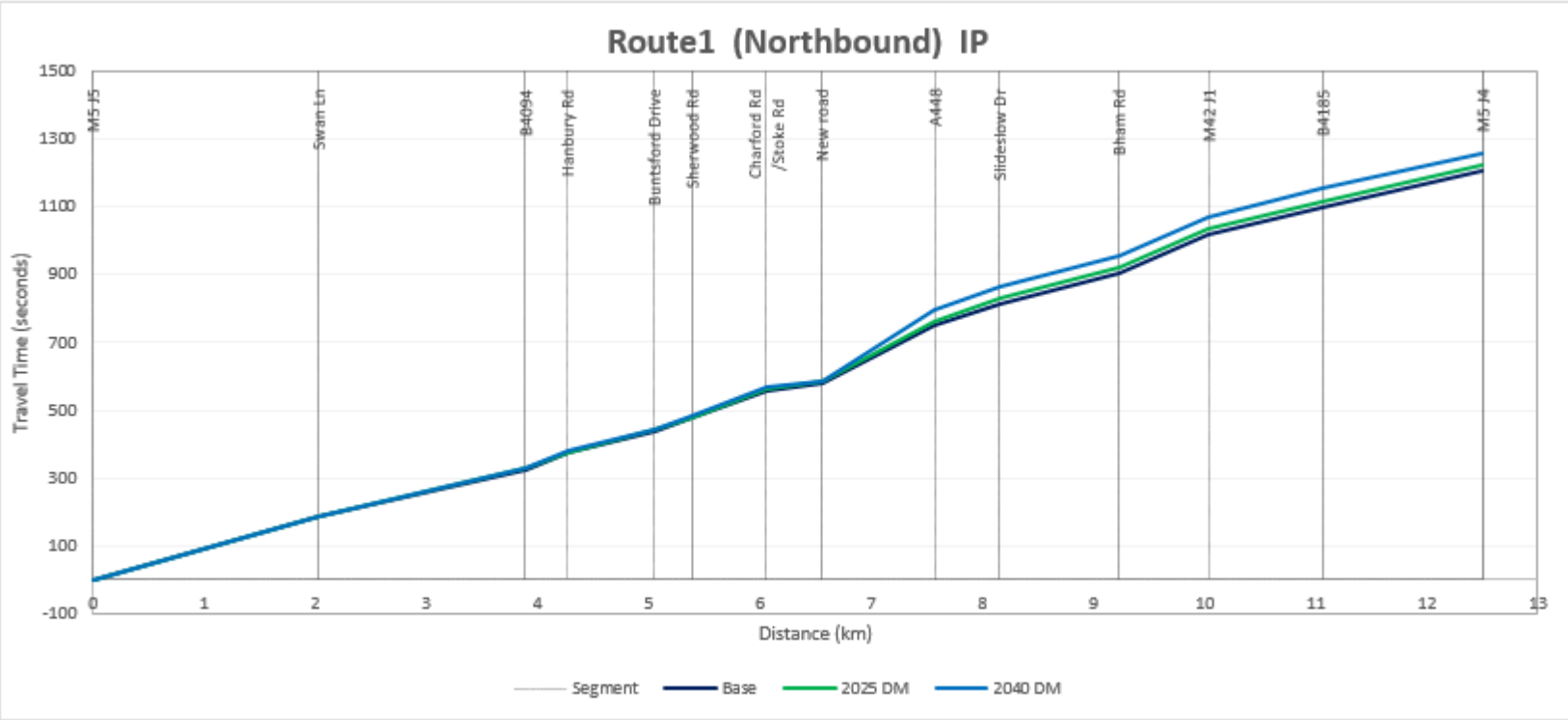

Route1 (Northbound) IP
Travel Time (seconds)
1500
1300
1100
900
700
500
300
100
-100
M5 J5
Swan Ln
B4094
Hanbury Rd
Buntsford Drive
Sherwood Rd
Charford Rd
/Stoke Rd
New road
A448
Slideslow Dr
Bham Rd
M42 J1
B4185
M5 J4
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Distance (km)
Segment
Base
2025 DM
2040 DM

Figure 0.52 – Southbound IP Journey Times from VISUM Model

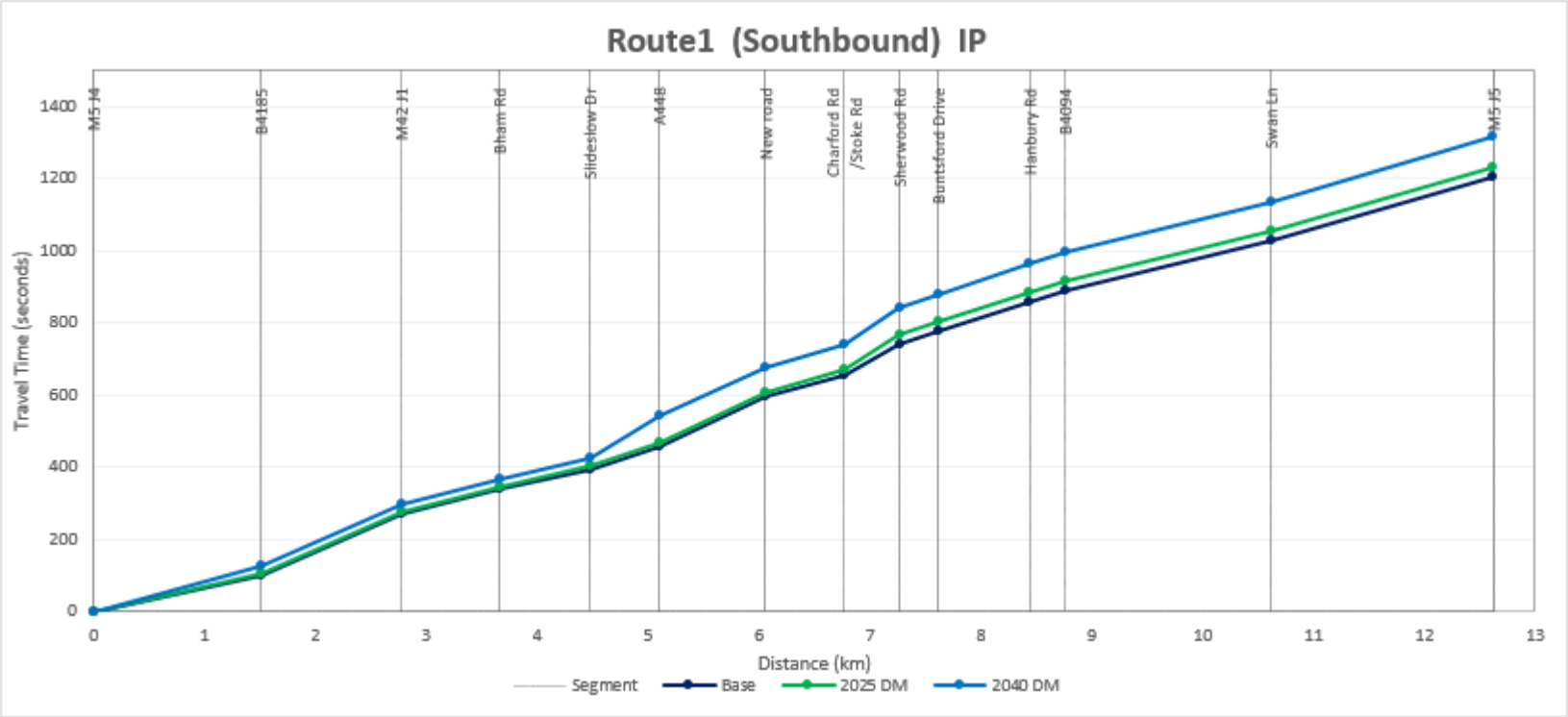


Figure 0.53 – Northbound PM Journey Times from VISUM Model

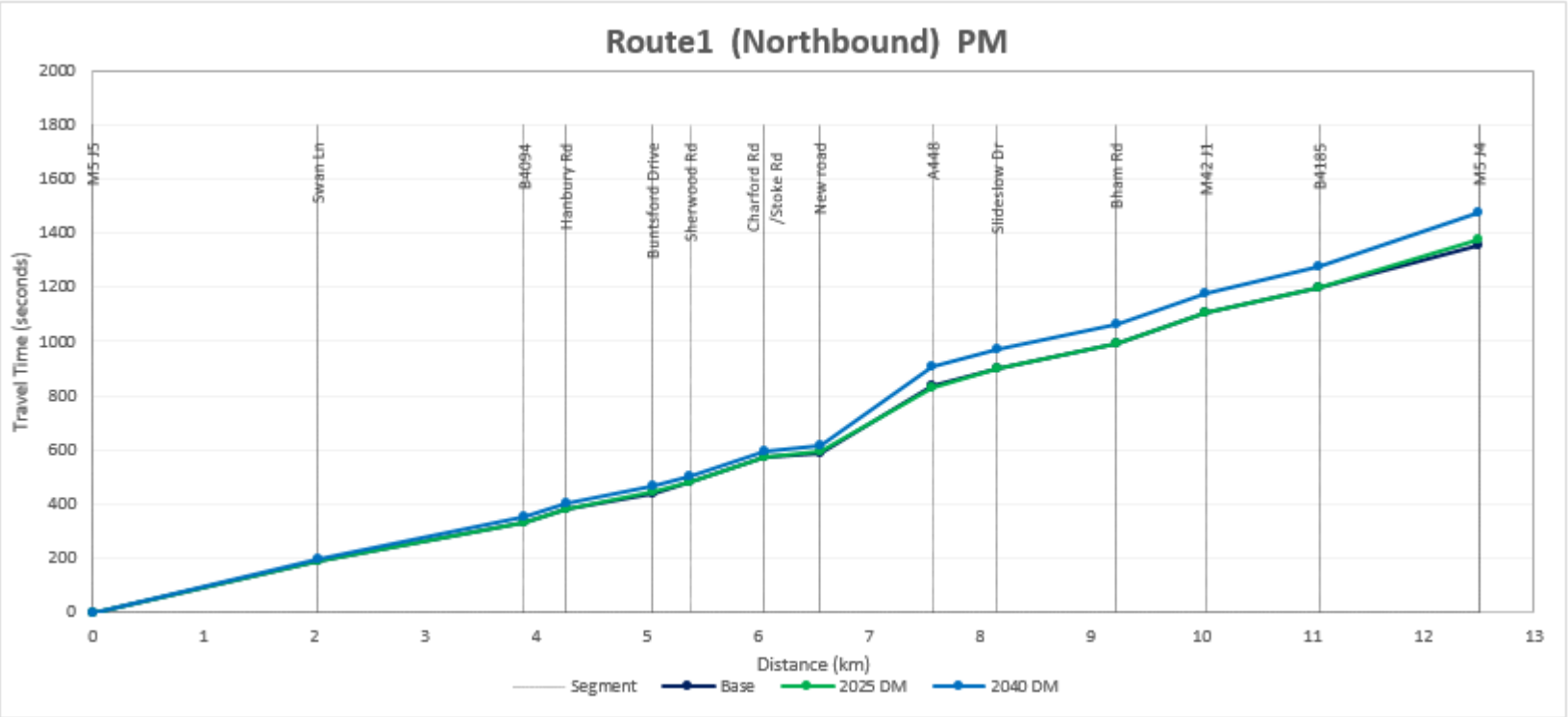


Figure 0.54 – Southbound PM Journey Times from VISUM Model

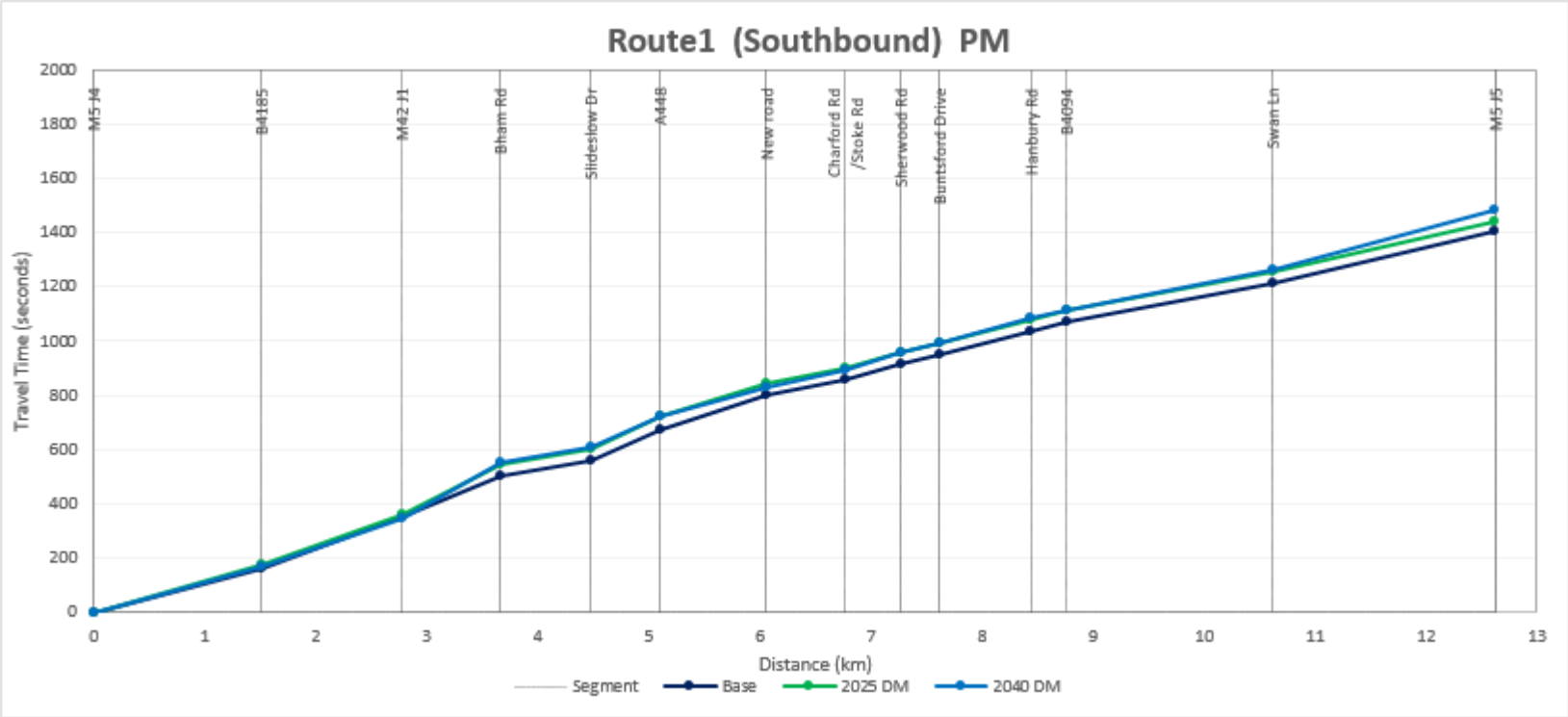


Table 0.30 sets out the journey time data for the route in the 2017 base, plus 2025 and 2040 Do Minimum scenarios. Congestion and delay at junctions affect the strategic role of the A38, both delaying traffic that is trying to reach the SRN or using the corridor as a diversionary route, as well as hindering local traffic trying to move around Bromsgrove.

Table 0.30 – 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 58 secs
AM Southbound	23 mins 1 secs	25 mins 4 secs	27 mins 8 secs
Inter Peak Northbound	20 mins 6 secs	20 mins 23 secs	20 mins 59 secs
Inter Peak Southbound	20 mins 1 secs	20 mins 32 secs	21 mins 57 secs
PM Northbound	22 mins 35 secs	22 mins 58 secs	24 mins 38 secs
PM Southbound	23 mins 24 secs	24 mins 3 secs	24 mins 40 secs

2.4.26 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 the OBC.

The planned growth in housing will increase the demand for travel. The future year transport modelling work captures this increased demand. Table 0.31 sets out the proportion of growth applied by journey purpose and mode, between the 2025 and 2040 forecast years and base scenarios.

Table 0.31 – Modelled Growth

	Forecast Year versus Base Scenario					
Date	**2025 Versus 2017**	**2025 Versus 2017**	**2025 Versus 2017**	**2040 Versus 2017**	**2040 Versus 2017**	**2040 Versus 2017**
Time	**AM**	**IP**	**PM**	**AM**	**IP**	**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%

2.4.27 Comparison Plots

Figure 0.55 and Figure 0.56 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 0.55 - 2040 DM Minus 2017 AM Peak – VISUM Comparison

Figure 0.56 - 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 V/C ratio is exceeded indicating that there are no concerns with regards to link problems (Figure 0.57 and Figure 0.58). This indicates that the problems on the A38 corridor are linked to the junction performance. Figure 0.59 and Figure 0.60 present the junctions that have a level of delay of more than 5 seconds.

Figure 0.57 – 2040 Do Minimum AM Peak – V/C Ratio

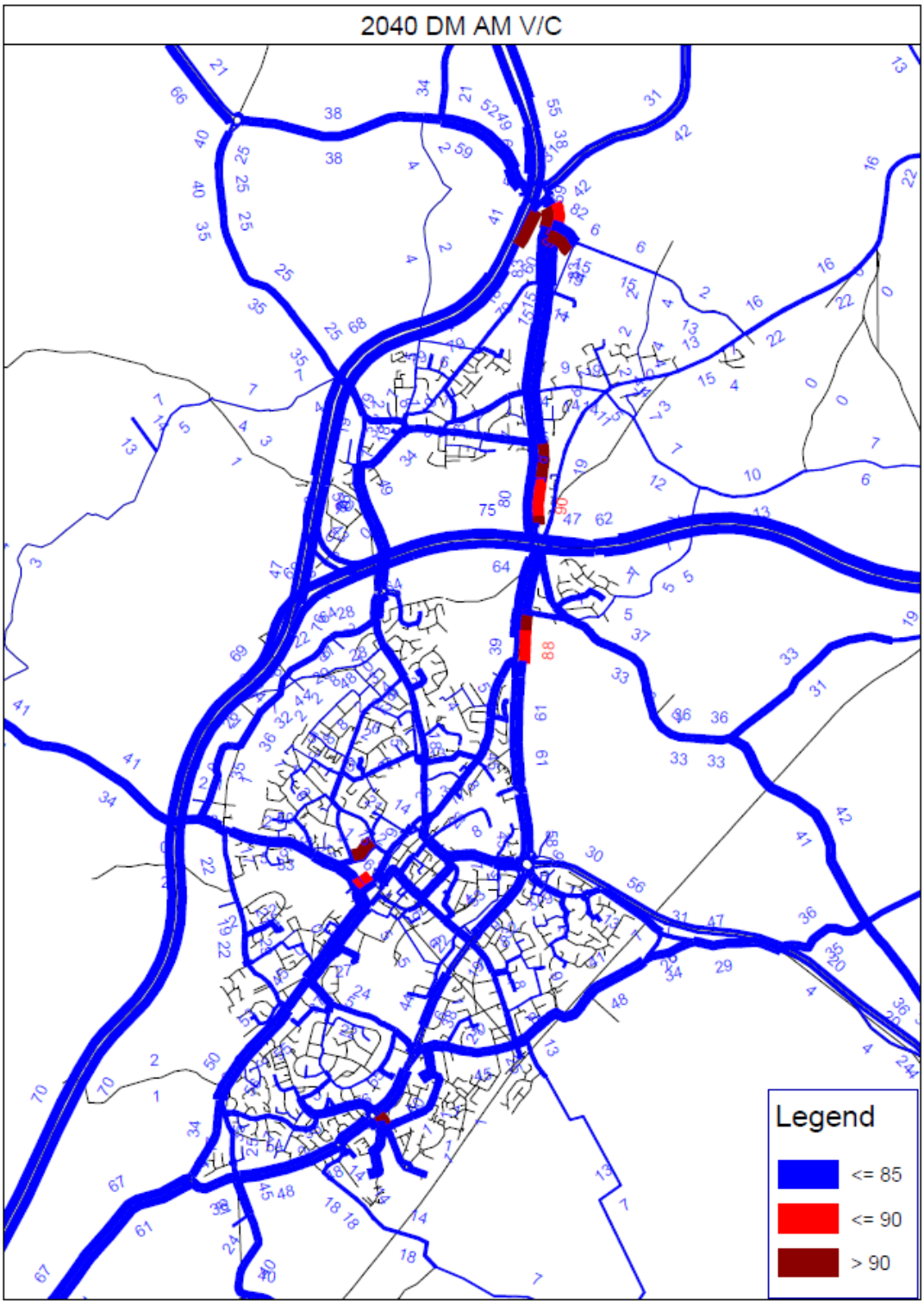


Figure 0.58 - 2040 Do Minimum PM Peak – V/C Ratio

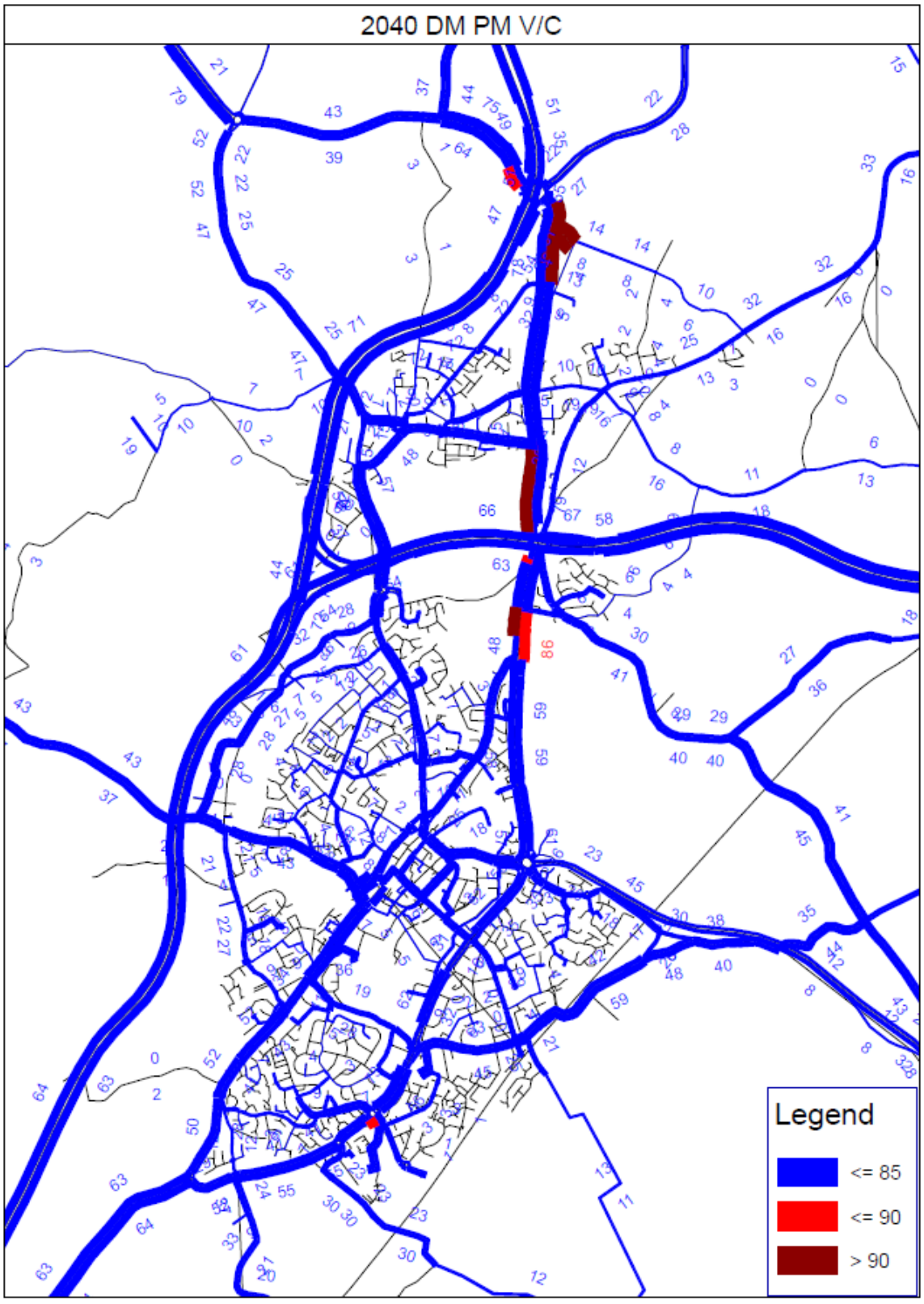


Figure 0.59 – 2040 Do Minimum Delay Hotspots at Junction Nodes – AM Peak

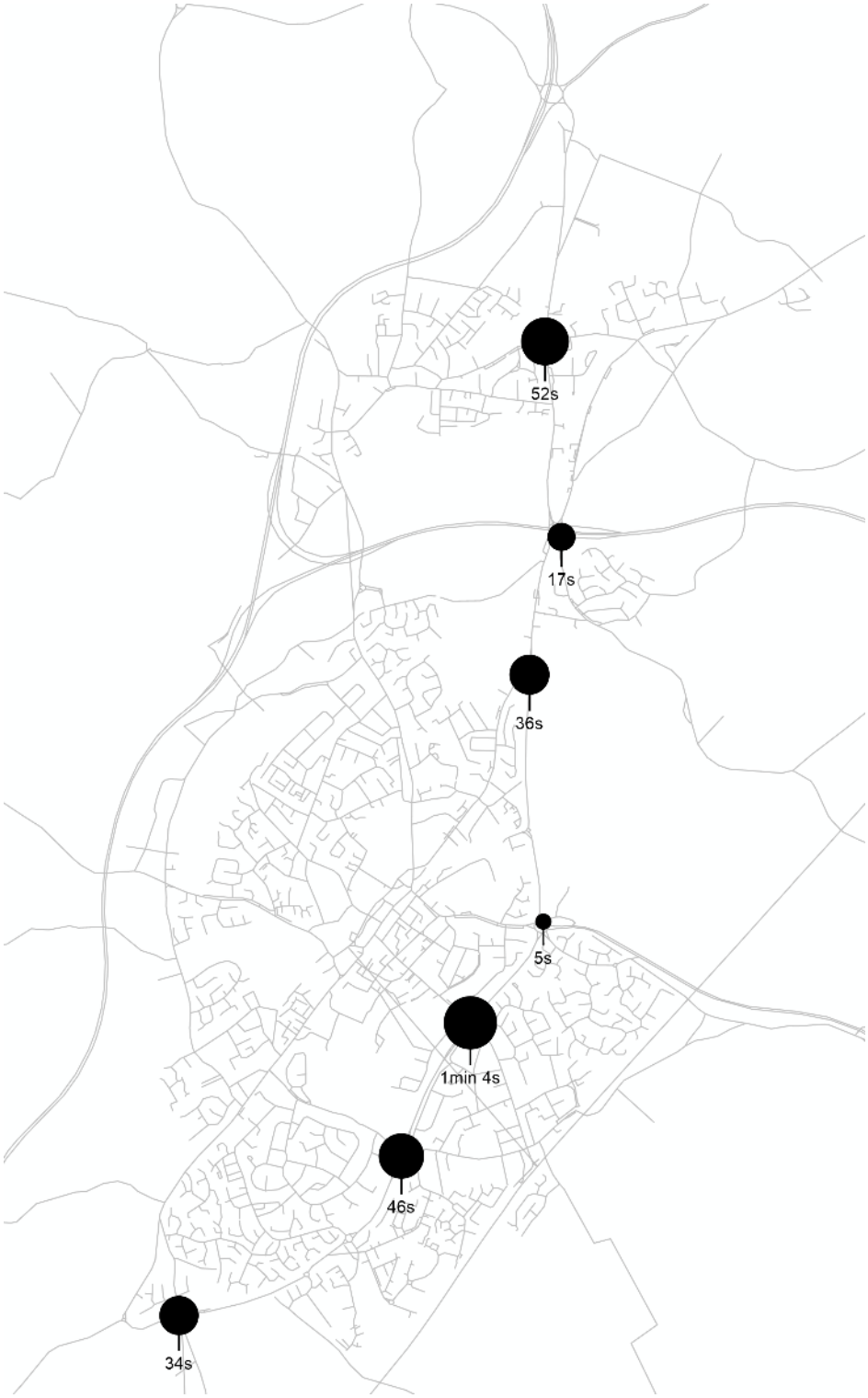


Figure 0.60 - 2040 Do Minimum Delay Hotspots at Junction Nodes – PM Peak

2.4.28 Traffic queues

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

2.5 Impact of not changing

Without the A38 BREP corridor scheme, the problems and issues outlined in sections 2.4 and 2.4.22 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 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 2.2), will not be realised. Table 0.32 provides further detail.

Table 0.32 – 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 2.4 and 2.4.22, setting out the high levels of car usage within Bromsgrove, limited alternative mode provision. 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 Strategic Economic Plans, and the 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 reports. The Local plans recognise to deliver this growth level, that 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. The A38 is hostile to non motorised users looking to cross without intervention and would lead to severe severance.

2.6 Objectives

Table 0.33 shows the scheme 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 SOBC 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.

Overall the objectives are based on the problems identification, align with the overall objectives of LTP4 and address the key challenges that the LTP identifies for North East Worcestershire.

Table 0.33 – A38 scheme 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 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 Major Road Network, 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 a part of the Major Road Network 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 chapter 3, 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 (and that traffic does not need to divert onto other less appropriate routes to avoid pinch points). 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.

A38 objectives	Rationale
Improve connectivity for pedestrians and cyclists on and across the A38 corridor, including to the 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 (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 – Delay is experienced at key junctions currently and this will increase in the future. 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. Congestion also affects the wider economy.
- Reliability and resilience – There are considerable variations in journey times. 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. Pressure on the A38 corridor will increase in the future due to the Local Plan development targets for both housing and employment growth. Capacity along the A38 corridor will need to be improved in order to accommodate planned and future growth.
- Conditions for pedestrians and cyclists - Poor conditions and severance caused by the A38 deter the use of walking and cycling for local trips and to the railway station. This contributes to congestion and poor air quality, directly impacting on the communities that live along the corridor.

Table 0.34 shows how the objectives address/relate to the problems identified on the A38 corridor.

Table 0.34 – A38 objectives and problems

	A38 Objectives				
Problems identified on the A38 Corridor	**Support the delivery of housing and employment growth**	**Reduce congestion and transport costs**	**Maximise the efficiency of the road network**	**Increased journey time reliability**	**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 0.35.

Table 0.35 – A38 objectives and MRN objectives

	MRN Objectives				
A38 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 along and across route facilities which should support a degree of modal shift.	Improvements to the A38 improve conditions on the SRN and access to/from the SRN.

2.7 Measures for success

Table 0.36 sets out how success will be measured for the A38 corridor scheme.

Table 0.36 – 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 Plan.	Local Plan 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 BDC and RDC 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.

Objective	What success will look like?	How will it be measured?
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.

2.8 Scope and options

The scheme for which funding is sought via this MRN OBC bid comprises interventions which target all modes, including highway, sustainable mode schemes and public transport schemes. These are detailed in the following paragraphs. This section should be read alongside:

- Appendix S.1, the OAR, which describes the process of scheme identification and development; and
- Appendix S.4, which contains drawings of each of the proposed schemes.

The package has evolved since SOBC stage and the full A38 package is detailed in the following sections. In brief the full A38 BREP scheme includes:

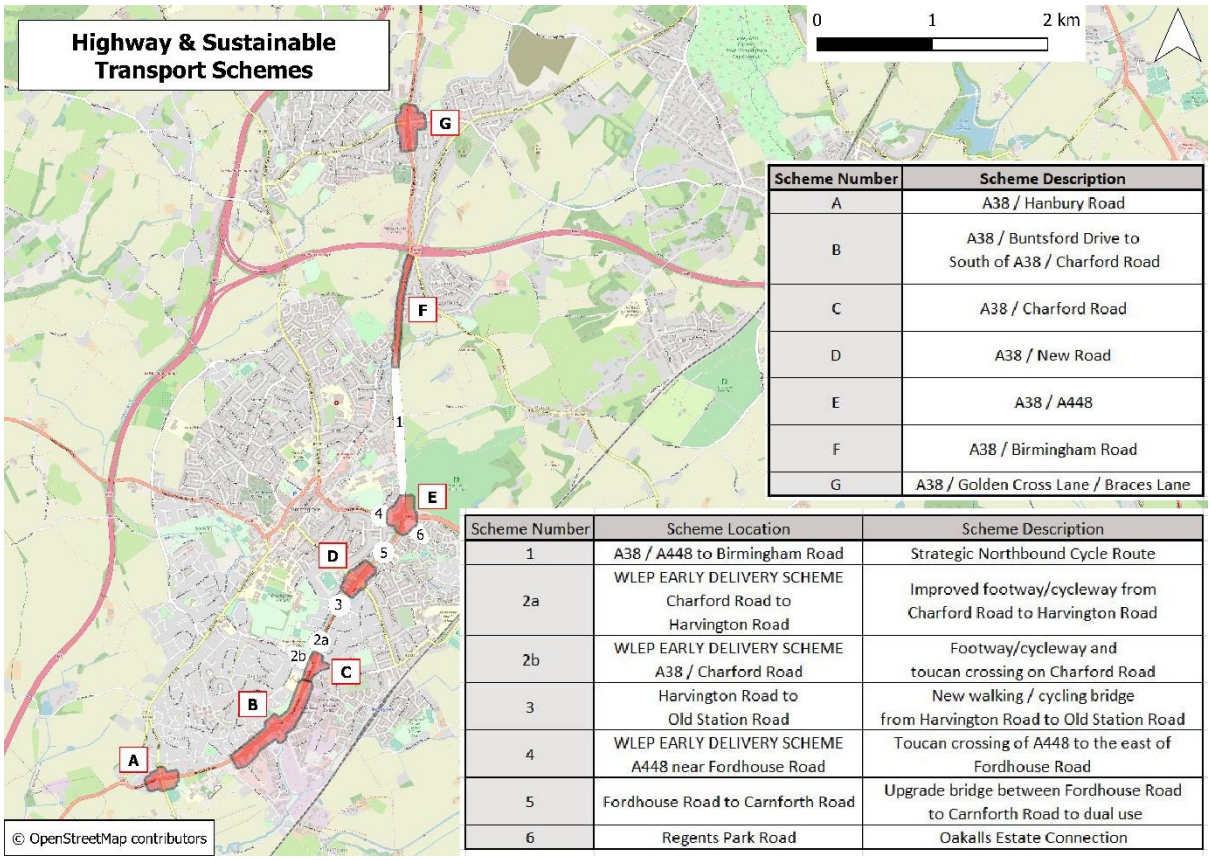
- Highways schemes, notated as Schemes A to G, targeting key junctions.
- Sustainable/active mode schemes, notated as Schemes 1 to 6.

  Of these, 3 schemes (schemes 2a, 2b and 4) have been taken forward as early delivery schemes, funded by WLEP which has its own FBC that will be used to inform the financial and economic cases of the wider scheme in hand. Hence, the early delivery schemes are reflected in the 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 OBC (which is considered to be aligned with the TAG requirements).

  Construction of these schemes began on site at the end of 2020 and are now completed. Schemes 1, 3, 5 and 6 are included within this OBC for MRN funding.
- Local public transport improvements, notated as schemes 7 and 8.

Figure 0.61 provides an overview of the highway and sustainable elements of the A38 scheme.

Figure 0.61 – Highway and sustainable transport schemes



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

2.8.1 Highway schemes

Seven highway schemes form the A38 BREP corridor scheme. The scheme locations and descriptions are detailed in Table 0.37. The OAR (Appendix S.1) provides full details of options assessment, while appendix S. 4 presents schemes drawings.

The key changes to the highway schemes since SOBC include:

- General review/progression of the design to reflect the new flows resulted from the model update, minimise land take where possible, avoid physical constraints and utilities.
- At SOBC stage 8 schemes were included (A – H). Through the development of the OBC schemes F and H have been combined into an expanded scheme F. At SOBC stage schemes F and H were at a very early stage of concept development. OBC work has focussed on detailed development of Scheme F and in particular the identification of a preferred option for the operation of the School Lane/A38 junction.
- All SOBC stage schemes have been reviewed to identify additional opportunities for pedestrians and cyclists. This has resulted in the addition of pedestrian crossings to various schemes and the inclusion of key provision for pedestrians and cyclists within Schemes B and C (as part of the wider vision for a north south parallel cycle route, much of which is included as sustainable Scheme 1 at SOBC stage).
- Schemes B and C have been reconfigured to minimise land take.

Table 0.37 – Highway schemes

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 Railway 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 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.

OBC Reference	Scheme location	Description of proposed scheme
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 kerblines 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.

2.8.2 Active Mode schemes

The following schemes for Active Modes make up part of the A38 corridor scheme. The scheme locations and descriptions are detailed in Table 0.38.

During the OBC development stage the Active Mode schemes have evolved considerably in response to:

- Technical work which has identified additional opportunities identified to enhance provision for pedestrians and cyclists.
- A design review undertaken following publication of Local Transport Note 1/20.
- Feedback received from stakeholders during an engagement exercise undertaken in early 2020.

The following are key changes since the SOBC stage scheme:

- The OBC stage Scheme 1 is a new scheme added in response to engagement feedback which called for additional facilities for pedestrians and cyclists. Overall 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 SOBC stage scheme 1 has been combined with Scheme B to be delivered as an integral part of the 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 since SOBC stage, which has been added in response to engagement feedback.
- Schemes have been reviewed in light of guidance in LTN 1/20, where relevant and justified, and in response to Road Safety Audit Stage 1 and 2 comments.

Table 0.38 – Active Mode schemes*

OBC Reference	Scheme Location	Scheme Description
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.
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.

OBC Reference	Scheme Location	Scheme Description
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 (HOW College) and Regents Park Road and Fordhouse Road up to eastern extent of zig zag 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.

** Active Travel Corridors are defined and identified in the LTP4.*

***Scheme 2a, 2b and 4 have been constructed as an early delivery scheme, funded by WLEP. It forms part of the wider scheme local contribution and is included in the do minimum scenario.*

2.8.3 Public transport schemes

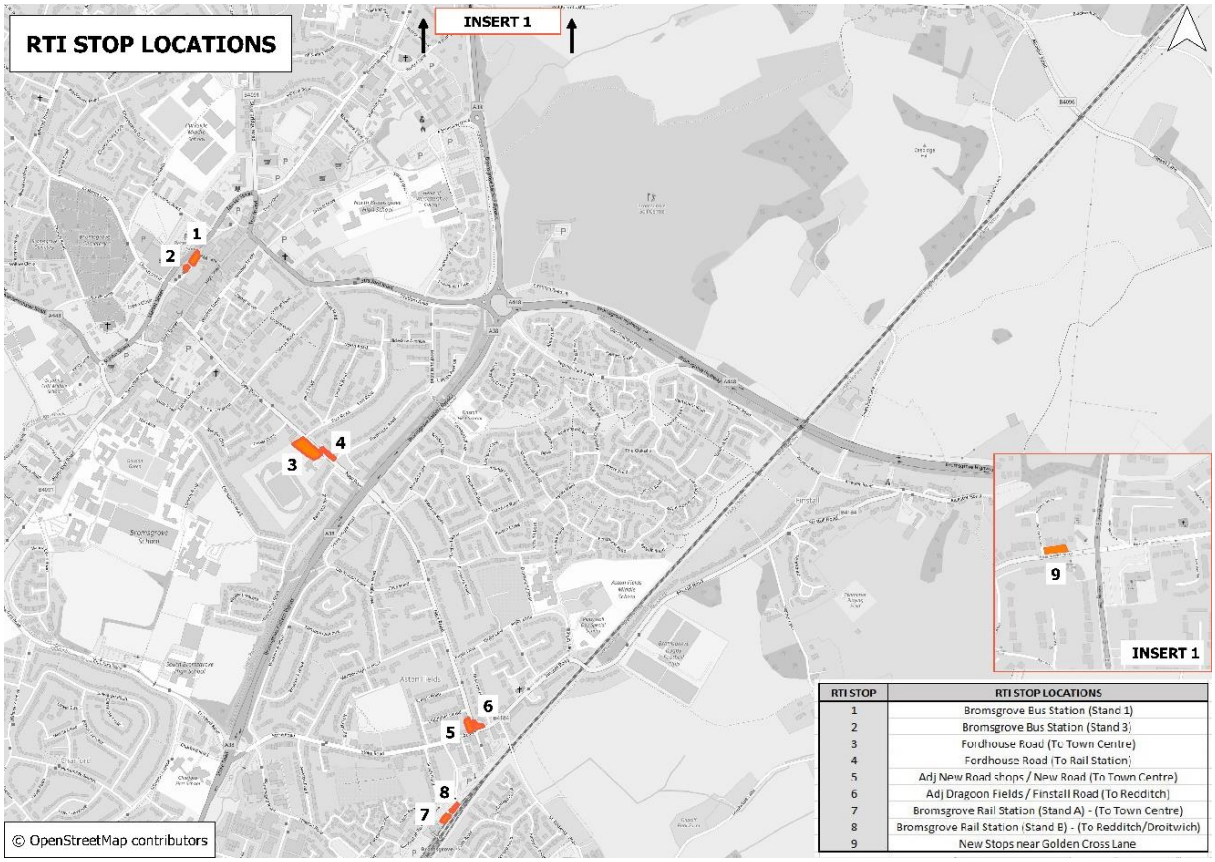
At SOBC stage no specific public transport measures were included in the package of measures. However, local improvements are now proposed in the light of recent DfT requirements.

The OBC includes two local improvement measures for buses. These are the inclusion of select vehicle detection and the upgrade of existing bus stops to install Real Time Information (RTI). Table 0.39 provides further details. Figure 0.62 presents the locations of scheme 7 interventions.

Table 0.39 – Public transport schemes

OBC Reference	Scheme Location	Scheme Description
7	Real time information (RTI)	Provision of upgrades to bus stops to install additional information on the route between the Town Centre and Railway Station. This allows for 9 bus stop upgrades, plus RTI screens at Town Centre (Bromsgrove Bus Station), Fordhouse Road (By the Ryland Centre), New Road, Bromsgrove Station and new stops on Golden Cross Lane (near Marlbrook Crossroad).
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 Railway station.

Figure 0.62 – Scheme 7/ RTIS stop locations



2.8.4 Design stage

During the OBC preparation stage the scheme design work has progressed through preliminary design stage. In addition, work has moved on for some of the schemes to more detailed design – this work, which would normally take place at FBC stage, has been front loaded in order to ensure that FBC stage can progress rapidly in order to maintain momentum in the overall delivery programme.

The design development work has been supported by the LTN 1/20 assessment and Road Safety Audits (RSA).

Table 0.40 provides an overview of the design status of each scheme.

Table 0.40 – Design stage

Scheme	Design stage	RSA stage
A	Preliminary Design	RSA Stage 1
B	Preliminary Design	RSA Stage 1
C	Preliminary Design	RSA Stage 1
D	Detailed Design	RSA Stage 2
E	Preliminary Design	RSA Stage 1
F	Preliminary Design	RSA Stage 1
G	Preliminary Design	RSA Stage 1
1	Detailed Design	RSA Stage 2
3	Preliminary Design	N/A
5	Preliminary Design	N/A
6	Detailed Design	RSA Stage 2
7	Preliminary Design	N/A

2.9 Constraints and inter-dependencies

There are a number of constraints that have defined the parameters within which the A38 BREP scheme has been developed. In general terms, the effects of constraints have been either eliminated or mitigated through the design process. The aim of design development undertaken during the OBC stage has been to establish how the scheme objectives can be achieved in the most economically advantageous way within the constraints.

Table 0.41 presents a summary of the key constraints.

Table 0.41 – Constraints and inter dependencies

Constraint	Issue	Design response
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.
Planning permission	Planning permission will be required for Schemes 3 and 5. A Screening Opinion has confirmed (in 2020) that other works do not require EIA and it is anticipated that these	Early liaison with Planning Authority and with Worcestershire Regulatory Services. An updated Screening Opinion will be sought between the OBC submission and the preparation of the FBC based on the updated traffic model output and designs and is

Constraint	Issue	Design response
	can be delivered as Permitted Development.	expected to further reconfirm the PD rights as the previous 2020 screening decision.
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 EIA Screening Request. The Screening Response confirmed that air quality considerations, although important, did not trigger EIA. Noise mitigation measures will be considered. Noise assessment work will be updated to reflect both the updated designs and traffic model.
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 mitigation will be considered taking into account seasonal restrictions.
TPOs/Trees	There are trees subject to a TPO within the scheme extents of Schemes A, B and C. Proposed design for drainage and earthworks to be included in the Tree Protection Plans (appended to the Arboricultural Method Statement) to determine the Root Protection Area (RPA) of each individual tree. Screening for residential properties (particularly those aligning the A38/Stoke Road on Scheme B).	There has been early 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 will be considered/implemented. WCC's commitment to replanting two trees for every one removed as part of the works. This has been considered in the landscaping 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. Scheme B is seriously affected by an existing sewer flooding	There has been early liaison with the Environment Agency/Lead Local Flood Authority. Drainage Strategies prepared for each scheme include an assessment of flood risk from all sources relevant to the scheme.

Constraint	Issue	Design response
	issue and parts of the area are within Flood Zone 3 associated with the Sugar Brook.	
Land availability	Areas of third-party land are required to deliver Schemes B and C.	It is assumed that land can be secured by negotiation, but Cabinet approval is in place for CPO if required. Early negotiation with landowners already started.
Highway standard	Design development may require some variation to DMRB standards given site constraints.	Apply for early departure from standard, if required. Early engagement with WCC as highways authority.
Underground services	Works required may interact with utilities.	Undertake utilities searches. Close liaison with utility companies regarding potential diversions, costs and phasing between different elements of the scheme. Utilities costs are included in the estimates which underpin the Financial Case.
Construction phasing	Construction of different elements of the scheme might interact with other schemes construction timeline causing distribution on the road network.	Early 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.

2.10 Stakeholders

Overall, the scheme has a good level of stakeholder support. For example, the scheme is well supported by:

- Midlands Connect have ranked it in their top ten schemes within the region, through the Regional Evidence Base. A letter confirming the support of Midlands Connect is 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 funding to the A38 corridor (this has funded Part 1 works, the construction of the A38 BREP early delivery schemes (schemes 2a, 2b and 4) and the development of the SOBC and OBC stages of this MRN bid). A letter of support from both WLEP and Herefordshire and Worcestershire Chamber of Commerce is included in Appendix S.5. This letter is signed by 25 local businesses demonstrating their support of the scheme, in addition to several letters from developers as presented in Appendix S.5.
- GBSLEP have approved previous stages of the Business Case process and awarded funding for Part 1, Phase 1. A letter confirming the support of GBSLEP is included in Appendix S.5.
- National Highways, who approved funding for Part 1, Phase 2, via their Growth and Housing Fund (GHF) and have engaged with the team to review the OBC scheme proposals. Engagement with National Highways has been a particularly important part of the OBC development. The Management Case provides full details of the process of engagement. A letter confirming the support of National Highways is included in Appendix S.5.

- Homes England, who gave their support via the Housing Infrastructure Fund (HIF) process in 2017.
- WCC Councillors, who approved the overall concept of the (previously developed) scheme for the A38 in July 2018 at a meeting of the full Cabinet and supported implementation of Part 1. WCC Councillors have been further involved in the development of the scheme for OBC, via meetings and briefing sessions. The scheme which broadly forms the basis of this OBC was presented to Cabinet on 22nd October 2020 and received endorsement.
- The MP for Bromsgrove who provided a letter of support at OBC stage. This is included 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.

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

2.10.1 Optioneering, assessment and sifting

2.10.1.1 Introduction

The schemes identified above for inclusion in this MRN bid, tackle congestion at junctions, as well as problem locations for pedestrians and cyclists.

As part of the development of the SOBC a high-level OAR was prepared. This document has been updated to accompany this OBC as Appendix S.1. It describes the work undertaken to generate, appraise, develop and sift potential options. Paragraphs included in section 2.10.1 only provide a summary.

2.10.2 Long list of potential strategic options

The 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 is being used at an early stage in the development of scheme interventions for this study, 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.

2.10.2.1 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 0.42.

Table 0.42 – 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 Plan 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 Development Plan prepared to support the District Plan review in 2014. The Bromsgrove District Plan, adopted in 2017, and the Infrastructure Development Plan which supports it, focused on enhancements to the A38 corridor.
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.
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.

2.10.2.2 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 PT 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; and
- 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, Table 0.43 presents a summary of the results of the EAST assessment.

Table 0.43 - Summary of the results of the EAST assessment

Option	Strategic Case	Management Case	Economic Case (Economy)	Economic Case (Environment)	Financial Case	Commercial Case	Taken Forward	Remarks
Option 1 -Do Nothing	Fail	Pass	Fail	Pass	Pass	Pass	No	This option fails to pass the strategic case 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 cases 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 case due to lack of support by wider policy. 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

Option	Strategic Case	Management Case	Economic Case (Economy)	Economic Case (Environment)	Financial Case	Commercial Case	Taken Forward	Remarks
								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 case due to low support by wider policy. Failed to meet the economic case 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 case due to low affordability.
Option 7 – Upgrade A38 to Dual Carriageway	Fail	Pass	Fail	Fail	Fail	Pass	No	Failed to meet the strategic case due to low support by wider policy and does not solve the issues along the A38 corridor. Failed to meet the economic case 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 case 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 cases 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

Strategic Case

Option	Strategic Case	Management Case	Economic Case (Economy)	Economic Case (Environment)	Financial Case	Commercial Case	Taken Forward	Remarks
								and noise on the A38. Failed to meet financial case due to low affordability.

2.10.3 Short list of options

The EAST assessment concluded that a combination of the following strategic options are 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;
- Small scale PT infrastructure improvements (Such as RTI, Signal control improvements); and
- 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).

2.10.3.1 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 OBC stage the following tasks have supported the identification of junction 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 public engagement in February and March 2020.
- 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 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 corridor upgrade has been reviewed in the context of LTN 1/20.
- 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.

2.10.3.2 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 2.10.2. A review of the overall junction flows for each of the junctions on the corridor is presented in Table 0.44.

Table 0.44 – Flow Comparison Base vs DM

Junction	Peak	2017 Base	2025 Do Minimum	2040 Do Minimum
Worcester Road	AM		2029	2200
	PM		1899	2274
Hanbury Road	AM	2186	2182	2212
	PM	1980	1878	1969
Buntsford Drive	AM	1764	1797	1814
	PM	1714	1681	1820
Austin Road / Sherwood Road	AM	2551	2462	2567
	PM	2698	2604	2765
Charford Road	AM	3019	2518	2642
	PM	3064	2775	2958
New Road	AM	2643	2183	2256
	PM	2931	2393	2405
A38 / A448	AM	3773	3680	3809
	PM	4149	3866	4141
Slideslow Drive	AM	2191	1866	1858
	PM	2543	2162	2130
Birmingham Road	AM	2739	2698	2735
	PM	3065	3033	3031
M42 J1	AM	3190	3461	3688
	PM	3724	4279	4527
Braces Lane / Golden Cross Lane	AM	2708	2633	2756
	PM	2755	2880	2962
Woodrow Lane	AM	2039	2427	2564
	PM	2523	2809	2857
M5 J4	AM	4975	5272	6017
	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 0.44 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

2.10.3.3 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.
- 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 0.45 presents a summary of options assessed, with the preferred options highlighted in green.

Table 0.45 - High Level evaluation of options

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.

Junction	Option	Description	High Level Evaluation
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 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

Junction	Option	Description	High Level Evaluation
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 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.

Junction	Option	Description	High Level Evaluation
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.
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.

Junction	Option	Description	High Level Evaluation
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
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 re routing onto less suitable routes than the Alcester Road and A38.
A38 / Golden Cross 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.

Junction	Option	Description	High Level Evaluation
/ Braces Lane			
/ 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.
/ 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 options for each of the locations were then bought forward to be included in the OBC submission for the corridor evaluation and impacts calculations as presented in section 2.8.

2.10.3.4 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 15options).

The result of this assessment is presented in Table 0.46.

Table 0.46 – Option consideration Active Modes

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 Roa	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 Roa	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 Roa	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 Location	Sub Option	High Level Evaluation
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 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	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 Location	Sub Option	High Level Evaluation
active travel modes between Town Centre and rail station.		
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 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 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 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 SOBC 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 SOBC 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 Location	Sub Option	High Level Evaluation
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 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 Location	Sub Option	High Level Evaluation
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.

2.10.4 Recommended schemes

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. These are presented in Table 0.47.

Table 0.47 - Recommended Options

OBC Ref	Scheme Description	Modes supported	**Objective Check Reduce congestion and transport costs**	**Objective Check Maximise the efficiency of the road network**	**Objective Check Increase journey time reliability**	**Objective Check Support the delivery of housing and employment growth, as outlined in the adopted local plan**	**Objective Check 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	Walking / Cycling / Highway	✓	✓	✓	✓	✓
F	A38 / Birmingham Road to south of M42 Junction 1	Walking / Cycling / Highway	✓	✓	✓	✓	✓
G	A38 / Golden Cross Lane / Braces Lane	Walking / Highway	✓	✓	✓	✓	✓
1	Northbound Strategic cycle link	Walking / Cycling	✓		✓	✓	✓
2a*	Charford Road to Harvington Road	Walking / Cycling	✓		✓	✓	✓
2b*	Charford Road (Connection from Scheme 2A to School)	Walking / Cycling	✓		✓	✓	✓
3	Harvington Road to Old Station Road	Walking / Cycling	✓		✓	✓	✓
4*	A448 near Blackwood Road	Walking / Cycling	✓		✓	✓	✓
5	Fordhouse Road to Carnforth Road	Walking / Cycling	✓		✓	✓	✓
6	Regents Park Road Connection to Oakalls Loop	Walking / Cycling	✓		✓	✓	✓
7	RTI – New Road	Public Transport	✓			✓	
8	PT Select Vehicle detection	Public Transport	✓	✓	✓		

** Delivered early with local WLEP Funding*

2.11 Summary of Strategic case

In summary the Strategic Case 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 plan. Subject to the ongoing Local and District Plans review, 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, currently being considered through the Local Plan review process.
- 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, Worcestershire County Council, 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 preliminary and for some schemes detailed design stage, has shown schemes are deliverable. These designs have been used as the basis for robust costings which form the basis of this OBC financial case.
- The schemes identified for the corridor have reasonable level support from key stakeholders. Through this bid process, additional consultation and stakeholder engagement is planned.