MOTT MACDONALD

Balsall Common Transport Study

Impact of Future Growth on the Network

October 2020

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1 Introduction

1.1 Study Background

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

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

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

To ensure that a robust planning framework is in place that addresses these issues, the Council is undertaking a Local Plan Review (LPR).

To support the LPR, SMBC require a comprehensive transport evidence base, detailing the impacts of the revised plan on the transport network and any potential supporting mitigation measures.

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

The Balsall Common Transport Feasibility Study has been divided into different stages, this report provides an update to the draft issued in 2018, and additional reports have also been updated, or reissued with Balsall Common Stage 3 project. This is summarised as follows:

- Stage 2 / 3 – Baselining / Constraints Mapping (report submitted to SMBC, May 2017). This report has been updated and re-issued with updated land allocations.
- Stage 4 – Optioneering and Costings (Included within this report update and Stage 3 Reports)
- Stage 5 – Appraisal (This is included within Stage 3 Final Report)
- Stage 6 – Recommendations (The recommendations for the final package of mitigation and proposed next steps is included in the final report for Balsall Common Stage 3).

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

1) Looking to provide the initial picture of future network impact as a result the expected growth and how this affects the Optioneering stage of the Study. (This report)
2) Providing options for, and high-level costing of identified options where necessary. This has been developed in Balsall Common Stage 3 and delivered in the final report.

1.2 Stage 2 and 3 Summary

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

- Of the 90% of the population of Balsall Common who work outside the area, 84% drive to work
- Within Balsall Common, there is an average of 1.8 vehicles per household, significantly higher than regional and national averages
- Balsall Common is largely residential and future developments will contribute to a substantial increase in the resident population
- Congestion and delay is concentrated on the A452 Kenilworth Road in the AM and PM peaks
- It is arguable that public transport will need significant improvement as a result of proposed developments in Balsall Common
- The local pedestrian and cycle network is reasonably strong, but there is scope for improvement
- There are numerous planning, environmental and geological constraints which would impact any proposed highway intervention in Balsall Common, including but not limited to Public Rights of Way, HS2, Utilities, Land Ownership and Heritage Assets.

1.3 Report Structure

The purpose of this report is to analyse Balsall Common's highway network in detail, ultimately assessing the need for highway intervention within the study area in the context of future development. This is undertaken by analysing historic traffic growth, existing traffic conditions and planning data as well as using transport planning software such as TEMPro and TRICS.

The report is structured as follows:

- Chapter 2 reviews existing traffic conditions based on existing data, new data and on-site observations within the study area
- Chapter 3 assesses the level of traffic growth on the network from a range of sources, including UK Central, HS2 and Balsall Common itself
- Chapter 4 presents the methodology of the Spreadsheet Model used to assess traffic flows and link capacities within the study area
- Chapter 5 predicts future traffic flows and highway capacity on the network as a result of the development traffic outlined in Chapter 3

The report concludes with a summary section which identifies the key challenges facing the highway network in Balsall Common and how these impact on the need for intervention. Recommendations are then made as to the next phase of the Study.

2 Existing Traffic Conditions

2.1 Introduction

This chapter provides a summary of the existing traffic conditions in Balsall Common, based upon on-site observations gained from two separate site visits in April and June 2017, existing traffic data obtained from SPECTRUM[1], TfWM Data Insight and from surveys undertaken by Tracsis between 6 and 12 June 2017. An additional site visit was not undertaken in 2020 due to traffic impacts by COVID-19 not allowing a true reflection of 'normal' conditions.

2.2 Study Area

The Study Area has been agreed with SMBC and is reasonably small, enabling detailed focus on Balsall Common itself to give a comprehensive assessment of the highway issues directly affecting the settlement.

The Study Area, along with proposed developments in Balsall Common, is shown below in Figure 2.1.

Figure 2.1: Study Area

Source: SMBC and Ordnance Survey Mapping

[1] SPECTRUM was a database of traffic data maintained by Mott MacDonald on behalf of the West Midlands Combined Authority and its seven component Metropolitan districts. It has now been replaced by TfWM Data Insight.

2.3 On Site Observations

A summary of general observations from the two site visits, conducted on 26 April and 7 June 2017, is presented below in Table 2.1. More detailed observations from each site visit are also available in Appendix A.

Table 2.1:Site Observations

Issue	Observation
Queueing at A452/B4101 junction	Queues usually clear within the green time on all arms in the AM peak, with some exception on the A452 Northbound
	Queues do not clear on the A452 Northbound or Southbound in the PM peak
	Queues are reasonably long on the B4101 Eastbound in the AM peak but clear within the green time
	Long queues on the B4101 Westbound in the PM peak that sometimes do not clear within the green time
General Traffic Flow	Traffic is lighter in the AM peak, potentially due to peak-spreading, but there is still slow movement on the A452 Northbound
	Traffic is very heavy on the A452 in both directions in the PM peak, but particularly so Southbound from the Bradnocks Marsh Lane roundabout to the A4177 Meer End Road roundabout
	Traffic near the station is generally very light but is busier in the PM peak
	Traffic elsewhere is reasonably light
Causes of Delay	Heavy traffic on A452 which current infrastructure struggles to cope with
	Pedestrian crossings on A452 slow down traffic flow, particularly that just north of the Station Road roundabout
	Signalised junction at A452 / B4101 has a high volume of traffic on all arms during the peak periods

Source: Mott MacDonald

2.4 Traffic Data

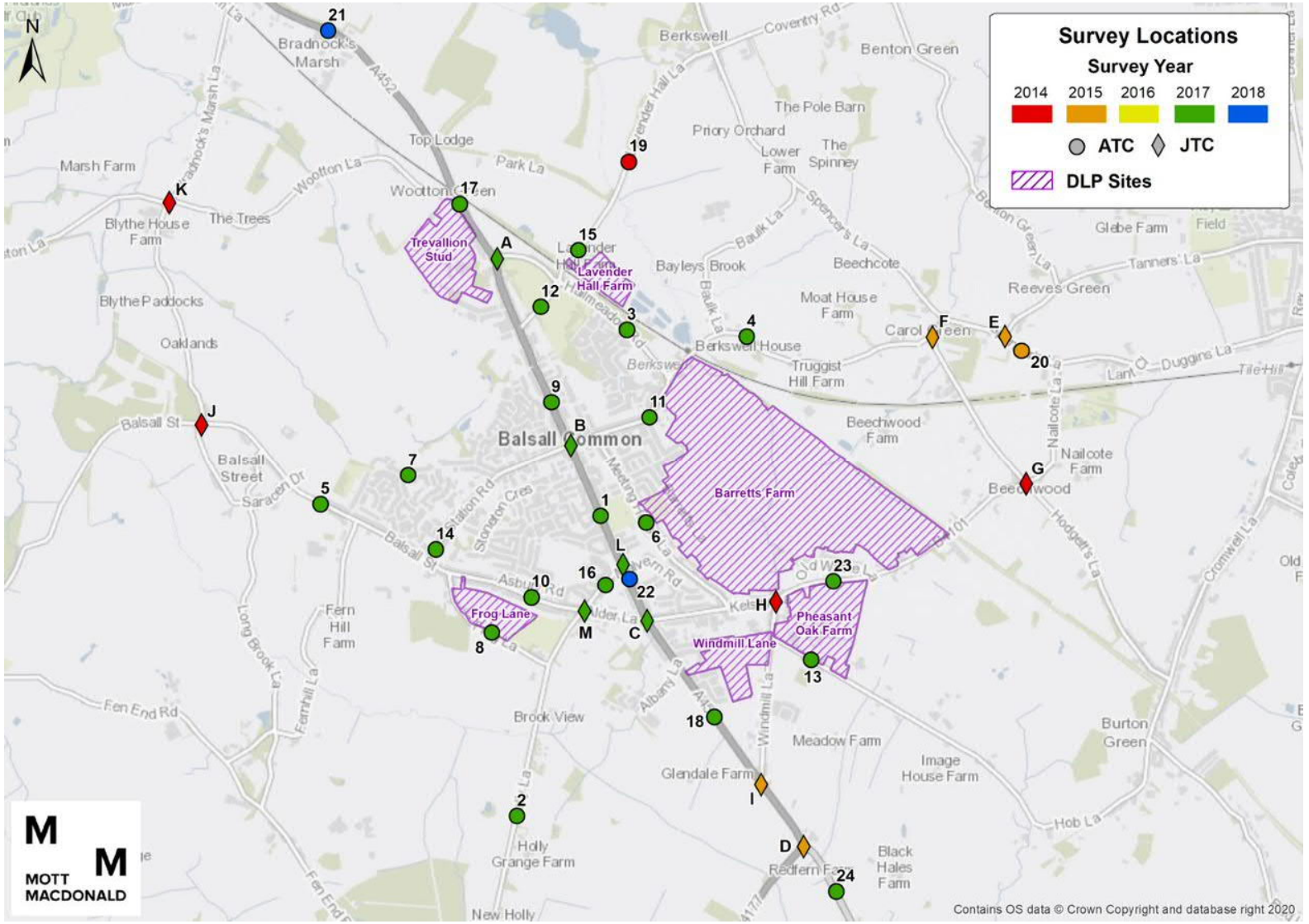
2.4.1 Introduction

Existing traffic data was available from TfWM Data Insight at a range of locations throughout the Study Area. Additionally, a number of surveys were undertaken by Mott MacDonald in 2017.

To supplement the existing traffic surveys, and to replace any counts over five-years old, it was proposed to undertake several new surveys, consisting of junction turning counts, queue surveys and automatic traffic counts. However, due to Covid-19 this was unable to take place

Figure 2.2 provides a map of all the available Automatic Traffic Counts (ATCs), shown as circles, and Junction Turning Counts (JTCs), shown as diamonds. The year the surveys were undertaken is also shown.

Figure 2.2: Existing Traffic Count Sites



Source: Mott MacDonald

2.4.2 Surveys Report

For the counts undertaken in 2017 by Mott MacDonald, no adverse weather conditions were experienced with the weather generally sunny or cloudy and between 10 and 20 Degrees Celsius.

2.4.3 Junction Turning Counts

Junction Turning Counts use video technology to record the movements of vehicles through a junction or roundabout across a specified time period. The data obtained can be used to assess the need to make changes to the layout of an existing junction or roundabout.

The turning counts undertaken by Mott MacDonald were conducted on Wednesday 7 June 2017 between the hours of 07:30 and 09:30 (AM Peak) and 16:30 and 18:30 (PM Peak).

Table 2.2 provides a list of the existing turning counts. Sites A to E denote counts done by Mott MacDonald in 2017, whilst data from sites F to M have been derived from TfWM Data Insight.

All the junctions listed below are subject to heavy traffic flow on a daily basis and analysis of these can give an idea as to whether key locations along the network are close to, or at capacity.

Table 2.2: Existing Turning Count Locations

Reference	Description	Survey Date
A	A452 Kenilworth Road / Hallmeadow Road	2017
B	A452 Kenilworth Road / Station Road	2017
C	A452 Kenilworth Road / Kelsey Lane / Alder Lane	2017
D	A452 Kenilworth Road / Gipsy Lane	2017
E	Gipsy Lane / Alder Lane / Holly Lane / Balsall Street East	2017
F	A452 Kenilworth Road / A4177 Meer End Road	2015
G	Tanners Lane / Spencers Lane	2015
H	Truggist Lane / Hodgetts Lane	2015
I	Nailcote Lane / Hodgetts Lane	2014
J	Windmill Lane / Waste Lane	2014
K	A452 Kenilworth Road / Windmill Lane	2015
L	Barston Lane / Balsall Street	2014
M	Bradnock's Marsh Lane / Wootton Lane	2014

Source: Data Insight

2.4.4 Queue Surveys

Queue Surveys were undertaken at the 2017 Junction Turning Count locations (sites A to E) detailed in Table 2.2, and use the same video technology to measure traffic volumes on each junction arm to provide evidence of congestion and delays. A queue is defined as those vehicles at a junction which are stationary or have slowed down to walking speed or less. Queue lengths are then estimated using the weighting system outlined in Table 2.3.

Table 2.3: Queue Survey Weighting System

Vehicle Type	Number	Metres
Pedal Cycle / Motor Cycle	0.5	2.5
Light Vehicle	1.0	5.0
Ordinary Goods Vehicle 1	2.0	10.0

Vehicle Type	Number	Metres
Ordinary Goods Vehicle 2	3.0	15.0
Bus	3.0	15.0

Source: Tracsis PLC

The queue surveys were undertaken on Wednesday 7 June 2017 between the hours of 07:30 and 09:30 (AM Peak) and 16:30 and 18:30 (PM Peak).

Table 2.4 below gives the average queue length at each of the five new turning count locations and the percentage of 60 second periods in each peak hour (AM and PM) where queues were longer than the reach of the camera (approximately 70-80m).

Table 2.4: Queue Data at New Turning Count Locations

Site Description	Junction Arm	Maximum AM Queue (PCUs)	% of AM Queue past camera limit	Maximum PM Queue (PCUs)	% of PM Queue past camera limit
A. A452 / Hallmeadow Road	North	0	0	13	93
	East	0	0	0	0
	South	0	0	0	0
B. A452 / Station Road	North	8	52	12	97
	East	2	0	9	20
	South	8	55	10	45
	West	4	0	3	0
C. A452 / Kelsey Lane / Alder Lane	North	12	43	14	98
	East	6	15	13	90
	South	14	92	14	93
	West	11	53	6	8
D. A452 / Gipsy Lane	North	3	7	9	30
	South	2	0	1	0
	West	1	3	1	0
E. Gipsy Lane / Holly Lane	North	2	0	1	0
	South	2	0	4	3

Source: Mott MacDonald

Maximum Queue Lengths in PCUs (Passenger Car Units) are calculated by taking the average queue length in each peak period in metres and dividing this by 5.75m, which is considered the average length of a PCU for robust queue analysis. Figures of ten and above indicate queues of 57.5m and above, which is approaching the limit of the queue cameras.

As can be observed from Table 2.4, there is clear evidence of heavy queueing during current traffic conditions, with three of the four sites on the A452 Kenilworth Road having over 90% of queues in either peak period being longer than the reach of the camera (approximately 70-80m).

2.4.5 Automatic Traffic Counts (ATCs)

The ATCs conducted in 2017 were undertaken between Tuesday 6 June and Monday 12 June 2017 over a 24-hour period each day. This was considered a ‘neutral week’ outside of school holidays, symptomatic of normal traffic flows. It must be noted, however, that the UK General Election was held on Thursday 8 June, which may have had a minor impact on this day’s data.

Table 2.5 provides a list of the existing ATCs, with data extracted from Data Insight.

The selection of sites below provides a wide range of locations across Balsall Common, with no main routes missed out. Therefore, it is possible to gain accurate figures as to total traffic flow in Balsall Common, which is vital, alongside capacity information, to making any decision as to whether highway intervention is required in the area.

Sites 17 to 24 were taken from Data Insight.

Table 2.5: Existing ATC Location

Reference	Description	Survey Date
1	A452 Kenilworth Road, south east of the junction with Station Road	2017
2	Holly Lane between Balsall Street East and Honiley Road	2017
3	Hallmeadow Road between junctions with Lavender Hall Lane and Station Road	2017
4	Truggist Lane, to the east of the junction with Baulk Lane	2017
5	Balsall Street, to the west of the junction with Station Road	2017
6	Meeting House Lane	2017
7	Needler's End Lane	2017
8	Frog Lane	2017
9	A452 Kenilworth Road, north of junction with Station Road	2017
10	B4101 Balsall Street East, between junctions with Kemps Green Road and Welby Gate	2017
11	Station Road, south-west of junction with Hallmeadow Road	2017
12	Lavender Hall Lane, south-west of junction with Hallmeadow Road	2017
13	Hob Lane, east of junction with Windmill Lane	2017
14	Station Road, between junction with B4101 Balsall Street East and Coplow Close	2017
15	Lavender Hall Lane, south-west of junction with Park Lane	2017
16	Gipsy Lane	2017
17	A452 Kenilworth Road, south of Wootton Lane	2015
18	A452 Kenilworth Road, south of Kelsey Lane	2015
19	Lavender Hall Lane north of Park Lane	2014
20	B4101 Spencers Lane	2015
21	A452, south of Bradnocks Marsh Lane	2018
22	A452 Kenilworth Road, north of Kelsey Lane	2018
23	B4101 Waste Lane, east of Windmill Lane	2017
24	A452 Kenilworth Road, south of Meer End Road	2017

Source: Mott MacDonald

2.5 Summary

To summarise, existing highway conditions in Balsall Common were assessed through site visits, ATCs, JTCs and queue surveys.

This combination of data sets has provided a robust input to the spreadsheet model which has been developed by Mott MacDonald to assess current and future conditions of the transport network in Balsall Common. This analysis is important in deciding whether further transport measures are required.

3 Traffic Growth

3.1 Introduction

This section explains how traffic growth has been calculated from the assumed base year of 2017 to account for increased trip generation from all the major developments relevant to the Balsall Common Study Area. These include:

- Expected background growth in Balsall Common (derived from TEMPro)
- Estimated impact of High Speed Two (HS2)
- The major development occurring at UK Central close to Birmingham Airport
- All planned developments in the Draft Solihull Local Plan Review

3.2 TEMPro

The Department for Transport's (DfT) Trip End Model Presentation Program (TEMPro) is an industry standard software tool used to estimate traffic growth for future years, allowing detailed analysis of pre-processed trip-end, journey mileage, car ownership and population/ workforce data from the National Trip End Model (NTEM).

TEMPro Version 7.2 has, firstly, been used to estimate traffic growth in the study area from past years up to a base year of 2017. Secondly, TEMPro growth factors have been used alongside existing traffic data to forecast future traffic flows up to 2026 and 2036.

TEMPro assumes a level of development within each MSOA, however the purpose of this study is to assess the development impact of the DLP. The DLP assumes more households than TEMPro for Balsall Common, therefore the number of households has been kept the same as the base (2017) to avoid double counting of development trips.

Table 3.1 provides the growth factors used in the following assessment, based on the following criteria:

- Modes selected: Car driver
- Areas selected:
  - County: West Midlands
  - Authority: Solihull
  - Ward: Solihull 025
- Forecast Years: 2026 and 2036

Table 3.1: TEMPro Growth Factors

Base Year	Future Year	AM Peak Factor	PM Peak Factor
2014	2017	1.047	1.50
2015	2017	1.033	1.034
2016	2017	1.013	1.013
2017	**2026**	**1.057**	**1.051**
2017	**2036**	**1.097**	**1.085**

Source: TEMPro

Resulting flows for each assessed link and junction are available on Appendix B.

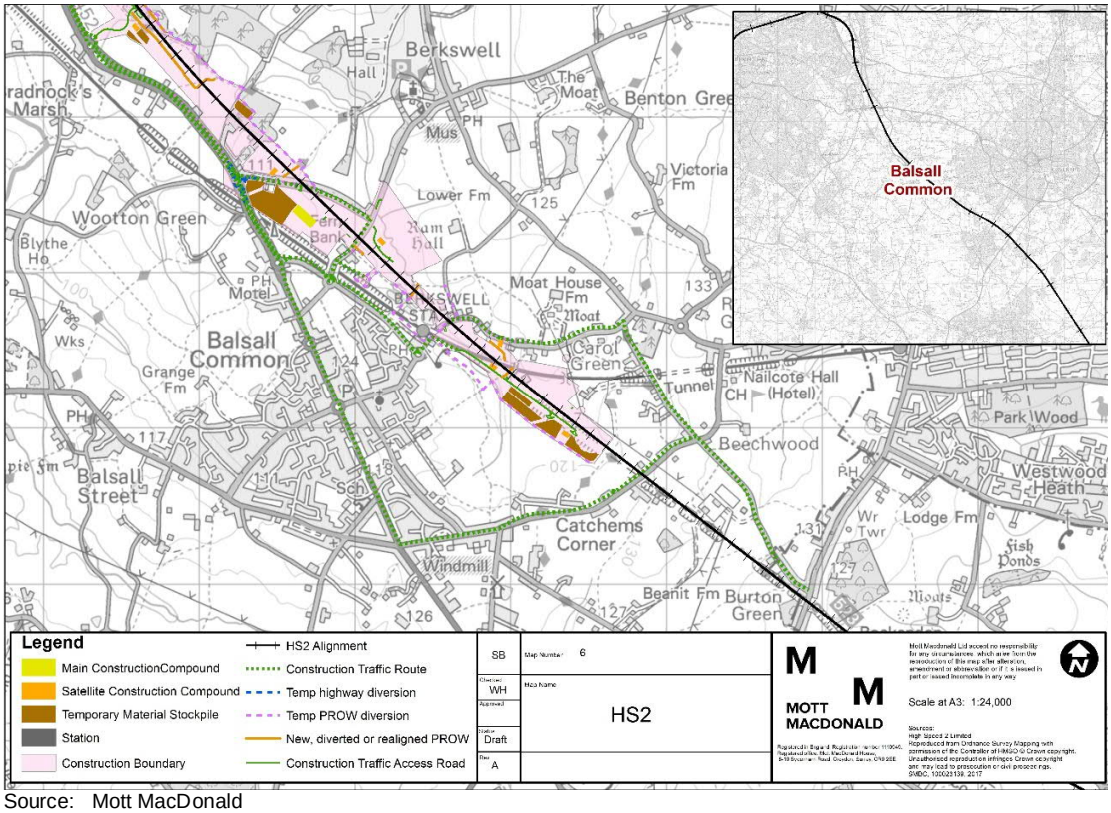
3.3 High Speed Two (HS2)

3.3.1 Description

HS2 is a committed high-speed railway linking London, Birmingham, the East Midlands, Leeds and Manchester. Phase One of the scheme will link London to Birmingham, with stations at London Euston, Old Oak Common serving Heathrow Airport, Birmingham International serving Birmingham Airport and Birmingham Curzon Street. HS2 was given formal approval by the Houses of Parliament in 2016, with construction planned to begin in 2017.

The new railway line will pass just north of Balsall Common, with construction traffic having an impact on the highway network within the Study Area and traffic potentially being further impacted once HS2 is in its operational phase, scheduled to be in 2026. Figure 3.1 shows the proposed route of HS2 north of Balsall Common and its Construction Boundary. There is currently significant construction work underway across the Solihull borough and elsewhere.

Figure 3.1: HS2 and Balsall Common



Source: Mott MacDonald

3.3.2 Trip Generation

As a result of the likely impact HS2 will have on the local and strategic highway network, HS2 Limited have developed trip generations to assess traffic at two stages:

- 2021 (Construction)
- 2026 (Operational)

In the HS2 'London – West Midlands Environmental Statement Volume 5 Transport Assessment' (November 2013), it is stated that "construction of the Proposed Scheme in the Balsall Common and Hampton-in-Arden area will have a number of temporary impacts", including:

- Increased traffic demand associated with construction works and workers accessing construction sites and compounds
- Temporary closure of roads and/or footpaths, requiring diversion routes for users

An assessment of the impact of construction related vehicle movements as well as any substantial closures in the Balsall Common area has been undertaken, with flows presented as a worst-case scenario based on the range of alternatives tested. The difference between 2021 baseline traffic without HS2 and 2021 baseline traffic with HS2 construction traffic was calculated, creating a percentage impact and volume-to-capacity ratio.

Full table of predicted flows for both the AM and PM peak on the assessed network are presented in Appendix C.

3.4 UK Central

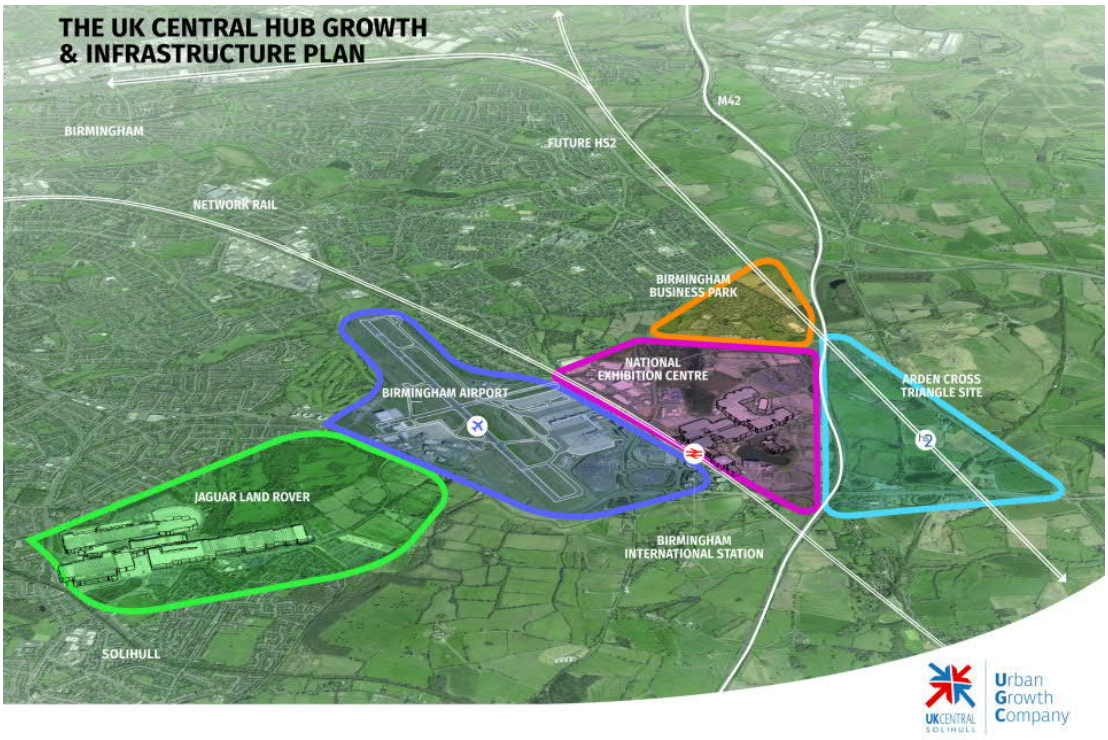
3.4.1 Description

UK Central, previously known as the M42 Economic Gateway, in Solihull is the West Midlands' principal international gateway and strongest performing economy, supporting an estimated 100,000 jobs throughout the region and contributing £5.1 billion to regional GDP. UK Central includes:

- The National Exhibition Centre (NEC) site, one of Europe's most prestigious venues and each year hosting over 500 exhibitions and events (pre-COVID-19 pandemic).The site also includes the Genting Arena, Vox Conference Centre and Resorts World
- Birmingham Airport, the UK's seventh busiest airport serving 12 million passengers per year (pre-COVID-19 pandemic)
- Jaguar Land Rover Solihull, one of the biggest employers in the local region with 10,500 staff at this site, over a quarter of the company's UK total
- Arden Cross, a vision for a community comprising high-quality homes, commercial space and retail and leisure facilities with the brand new HS2 Interchange Station at its heart
- Birmingham Business Park, an established employment centre in multiple ownership, with key occupiers including Rolls Royce, Fujitsu and BT

Figure 3.2 below provides a map of UK Central, shown within the UK Central Hub Growth & Infrastructure Plan (March 2017). This plan sets out the ambitions for the site up to 2030, with large-scale development planned across the hub.

Figure 3.2: UK Central Map



Source: The UK Central Hub Growth and Infrastructure Plan (Urban Growth Company, 2017)

3.4.2 Trip Generation

Trip generations and distributions for UK Central were developed through the Solihull Local Plan version of PRISM (West Midlands Policy Responsive Integrated Strategy Model).

Table 3.2 below shows the raw figures in in the PRISM Uncertainty Log for PRISM 5.2. In the updated PRISM Model, Jaguar Land Rover is included within other developments, and not a singular development.

Table 3.2: UK Central PRISM Figures

Location	PRISM Zone	Pop. Growth 2026	Emp. Growth 2026	Pop. Growth 2036	Emp. Growth 2036
Birmingham Airport	5065	0	569	0	569
The NEC	5066	0	316	0	316
Arden Cross	5212	1,165	0	2,330	29,534

Source: Mott MacDonald

From these figures, trip generations for the study area were calculated for three future scenarios and assigned to the links and junctions assessed. Full results of the assignment are presented in Appendix C.

3.5 Draft Local Plan Sites

3.5.1 Description

The draft local plan sets out growth in the borough of Solihull up to 2036. There are six draft local plan sites that are within the Study Area, that could potentially impact on the highway network.

Table 3.3 provides information regarding large scale housing developments (80 dwellings or more) proposed within the Study Area, built by 2036. A significant quantum of development is proposed within Balsall Common, with all sites totalling 1,515 new dwellings and a large primary school serving 420 pupils.

Table 3.3: Proposed Developments

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

Source: SMBC

3.5.2 Trip Generation

The trip rates (in bold) and trip generations for each of the four proposed developments in 2026 and 2036 are summarised in Table 3.4 and Table 3.5. These trip rates have been developed using the Trip Rate Information Computer System (TRICS). Separate TRICS calculations have been completed for residential and education developments.

TRICS is a large database of transport surveys covering a wide variety of development types which enables transport practitioners to estimate the potential volume of trips that will be generated from proposed developments. Initial trip rates for the purposes of this study were extracted from TRICS using the following selection criteria, whilst full TRICS outputs are contained in Appendix D.

For residential developments the following TRICS criteria was used:

- Residential Developments
- Houses Privately Owned
- England (excluding Greater London)
- Development size: 60 – 1,000 dwellings
- Date range: 01/01/2011 – 24/09/2019
- Weekdays only
- Location types: Edge of town centre, suburban area and edge of town
- Population within one mile: 5,001 – 15,000
- Population within five miles: 75,001 – 250,000
- Car ownership: 1.1 – 2.0 cars per household

For educational trips, the same criteria were used expect for the following:

- Land Use: Education – Primary
- Surveys between 79 to 657 pupils

Table 3.4: 2026 Development Trip Rates & Trip Generations

Site Name	Dwellings / Pupils	AM In	AM Out	PM In	PM Out
Residential Trip Rates	**Dwellings**	**0.135**	**0.414**	**0.378**	**0.155**
Barretts Farm	0	0	0	0	0
Windmill Lane / Kenilworth Road	120	16	50	45	19
Frog Lane	110	15	46	42	17
Lavender Hall Farm	0	0	0	0	0
Trevallion Stud	77	10	32	29	12
Pheasant Oak Farm	0	0	0	0	0
Education Trip Rates	**Pupils**	**0.598**	**0.499**	**0.035**	**0.06**
Barretts Farm Primary School	0	-	-	-	-

Source: TRICs

Table 3.5: 2036 Development Trip Rates & Trip Generations

Site Name	Dwellings / Pupils	AM In	AM Out	PM In	PM Out
Residential Trip Rates	**Dwellings**	**0.135**	**0.414**	**0.378**	**0.155**
Barretts Farm	875	118	362	331	136
Windmill Lane / Kenilworth Road	120	16	50	45	19
Frog Lane	110	15	46	42	17
Lavender Hall Farm	80	11	33	30	12
Trevallion Stud	230	31	95	87	36
Pheasant Oak Farm	200	27	83	76	31
Education Trip Rates	**Pupils**	**0.598**	**0.499**	**0.035**	**0.06**
Barretts Farm Primary School	420	251	210	15	25

Source: Mott MacDonald

3.6 Summary

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

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

Trips generated from these developments have been calculated and assigned to the transport network.

The next section provides the methodology used to produce a spreadsheet model, which has been used to assess future network demand, and capacity, in the area based on the varying levels of development described above.

4 Spreadsheet Model Methodology

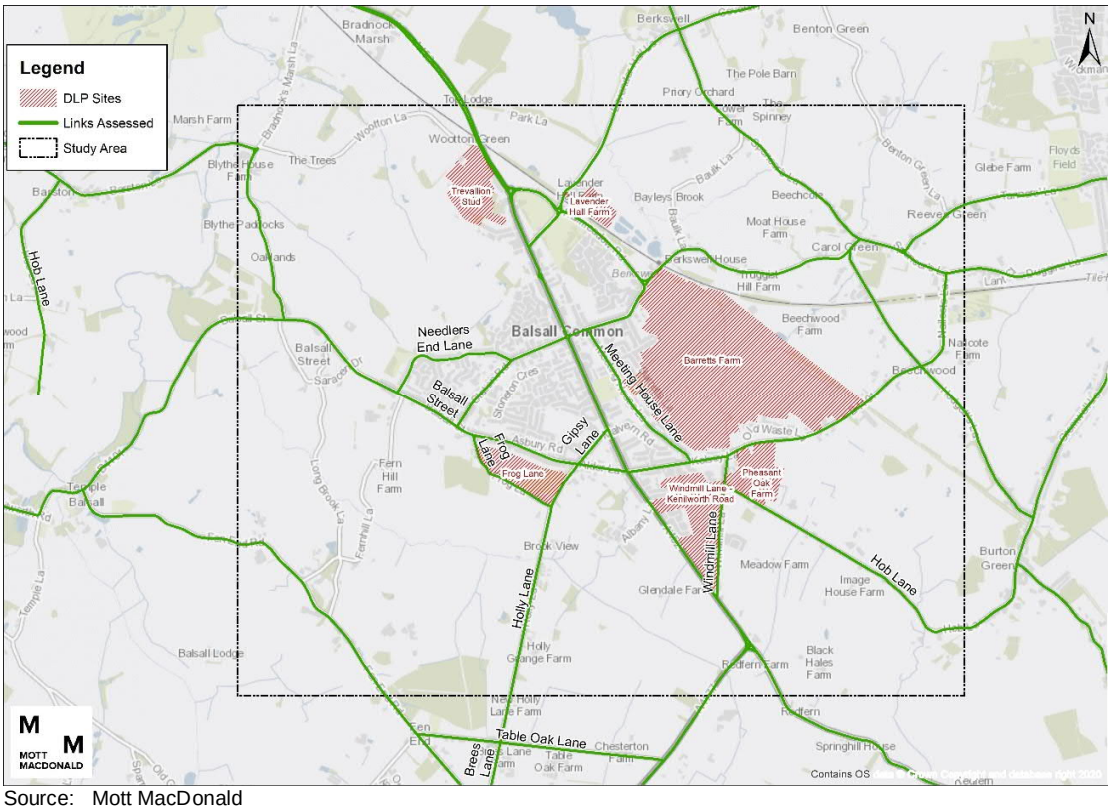
4.1 Introduction

The main objective of the spreadsheet model is to assess the impact of future growth on the network in terms of traffic flow and highway capacity. This will allow the identification of road links under stress now and in the future and will allow judgements to be made as to whether highway intervention is needed in Balsall Common now, in the future, or at all. This section explores the methodology of each element of the model.

4.2 Spreadsheet Model Assessment Area

To define the extent of the spreadsheet model, the key routes in the vicinity of Balsall Common have been identified and are shown in Figure 4.1. These include the A452 Kenilworth Road as well as all the major routes within and outside the village.

Figure 4.1: Spreadsheet Model Assessment Area



Source: Mott MacDonald

4.3 Methodology Limitations

It was agreed with SMBC at the outset of this Study that a spreadsheet approach would be used to appraise the current highway network and how this would perform in the future based on a variety of factors.

This methodology is associated with a number of risks and limitations given that only a limited number of links and junctions, for which data has been collected, can be assessed.

It must be noted that this analysis does not give a full picture of traffic congestion and capacity levels on the network. This is because flows can be affected by heavy queueing at junctions, which in turn affect the results of the analysis. For that reason, the capacity analysis is complemented with queue data and observations taken on site.

4.4 Link Capacity Methodology

In order to assess the capacity of the highway network within the Study Area and its relative level of saturation, the capacity of each road link for which data has been collected has been obtained using the method described in the Design Manual for Roads and Bridges (DMRB). DMRB provides standards, advice notes and other information relating to the design, assessment and operation of roads within the UK, with specific standards given regarding the capacity of various types of road, depending on several factors such as speed limit, width, number of lanes and road furniture.

Figure 4.2 and Figure 4.3 provide the different classifications that roads can be given and the standardised capacity levels they have been assigned under DMRB. For those road links of the network for which data is available, capacity figures have been determined using the known widths, speed limits, locations and levels of road furniture on each link.

Figure 4.2: DMRB Road Type Classifications

Feature	ROAD TYPE				
	Urban Motorway	Urban All-purpose			
	UM	UAP1	UAP2	UAP3	UAP4
General Description	Through route with grade separated junctions, hardshoulders or hardstrips, and motorway restrictions.	High standard single/dual carriageway road carrying predominantly through traffic with limited access.	Good standard single/dual carriageway road with frontage access and more than two side roads per km.	Variable standard road carrying mixed traffic with frontage access, side roads, bus stops and at-grade pedestrian crossings.	Busy high street carrying predominantly local traffic with frontage activity including loading and unloading.
Speed Limit	60mph or less	40 to 60 mph for dual, & generally 40mph for single carriageway	Generally 40 mph	30 mph to 40 mph	30mph
Side Roads	None	0 to 2 per km	more than 2 per km	more than 2 per km	more than 2 per km
Access to roadside development	None. Grade separated for major only.	limited access	access to residential properties	frontage access	unlimited access to houses, shops & businesses
Parking and loading	none	restricted	restricted	unrestricted	unrestricted
Pedestrian crossings	grade separated	mostly grade separated	some at-grade	some at-grade	frequent at-grade
Bus stops	none	in lay-bys	at kerbside	at kerbside	at kerbside

Source: DMRB Volume 5 (1999)

Figure 4.3: DMRB Road Type Capacities

		Two-way Single Carriageway- Busiest direction flow (Assumes a 60/40 directional split)									Dual Carriageway			
		Total number of Lanes									Number of Lanes in each direction			
		2				2-3	3	3-4	4	4+	2		3	4
Carriageway width		6.1m	6.75m	7.3m	9.0m	10.0m	12.3m	13.5m	14.6m	18.0m	6.75m	7.3m	11.0m	14.6m
Road type	**UM**	**Not applicable**										4000	5600	7200
	UAP1	1020	1320	1590	1860	2010	2550	2800	3050	3300	3350	3600	5200	*
	UAP2	1020	1260	1470	1550	1650	1700	1900	2100	2700	2950	3200	4800	*
	UAP3	900	1110	1300	1530	1620	*	*	*	*	2300	2600	3300	*
	UAP4	750	900	1140	1320	1410	*	*	*	*	*	*	*	*

Source: DMRB Volume 5 (1999)

It must be noted that:

- Capacities are in Vehicles per Hour
- HGV traffic is assumed to be less than or equal to 15% of total traffic
- Capacities are excluded where the road width is not appropriate for the road type and where there are too few examples to give reliable figures.

4.5 Junction Capacity Methodology

Junction capacity assessments based on detailed modelling were not included in the scope of this study. In place of junction capacity assessments, the following methodology was adopted depending on the type of junction being considered:

- Roundabouts: DMRB capacity figures were obtained for each arm based on the method described in Section 4.4. Capacity figures were also obtained in Junctions 9 software and a comparison was made between the two figures, with the lower of the two being chosen. This is to show a worst-case scenario.
- Priority Junctions: Similar to the methodology for roundabouts, a comparison was made between the DMRB capacity figures and those obtained from Junctions 9 software. The software differentiates between the capacity levels for strictly ahead movements and for right-turn movements where conflicts exist with traffic movements from other arms. An adjusted capacity figure for each arm was then calculated taking into account the proportion of right-turners.
- Pedestrian Crossings: An adjusted capacity figure was calculated by applying reduction factors that take into account the green time for vehicles at the crossing. This was done at the junctions which were in close proximity to a pedestrian crossing.
- Signalised Junctions: An adjusted capacity was calculated based on the proportion of green times at each arm which was obtained from existing controller specifications.

This analysis has been carried out to ensure the results reflect the reality and the existing conditions of the junctions. Appendix F provides further details of this method as well as worked examples.

4.6 Assessment Years

As explained above, the assessment years are as follows:

- 2017 Base Year
- 2026 Future Year
- 2036 Future Year

4.7 Hours of Assessment

ATC, Turning Count and Queue Survey data were analysed in 15-minute intervals to find the network peak hour for the AM and PM periods. These were found to be:

- AM Peak: 08:00 to 09:00
- PM Peak: 17:00 to 18:00

4.8 Summary

A robust methodology has been adopted in order to develop a spreadsheet model, which includes elements based on the local situation specific to the study area as well as national standards. This is summarised below:

- The Study Area was defined through analysis of the busiest links within and outside Balsall Common
- The modelling methodology is based upon a 2017 base year developed from newly collected data and TEMPro growth factors applied to 2014,15, 16 data
- The link capacity methodology is based on a DMRB national standards.
- Assessment Years are aligned with the DLP period
- Peak times were identified as 08:00-09:00 for the AM period and 17:00-18:00 for the PM.

5 Impact of Traffic Growth on Highway Capacity

5.1 Introduction

This section presents the results of the traffic data analysis undertaken through the spreadsheet model and compares our findings with the survey data and site observations conducted previously. This section has been updated to reflect the changes made to the proposed development quanta for the DLP sites.

5.2 Link and Junction Analysis Results

Analysis of traffic conditions at present and in multiple future scenarios has been undertaken through the spreadsheet model, with full results for every link and junction assessed included in Appendix H and H respectively.

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

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

Figure 5.1, Table 5.1 and Table 5.2 present maps of link and junction capacities for the 2017 Base Year, 2026 Growth (Scenarios 1 to 4) and 2036 Growth (Scenarios 5 to 8) respectively.

Notes on these maps are as follows:

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

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

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

Figure 5.1: 2017 Base Year - Capacity Results

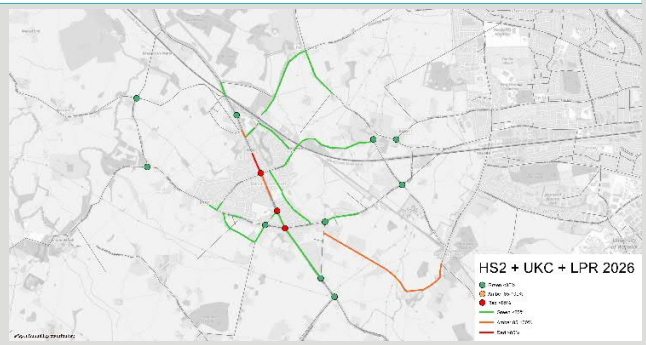
Source: Mott MacDonald

As can be observed from Figure 5.1 above, no roads in the baseline are operating over capacity, with Hob Lane and A452 between Station Road and Lavender Hall Lane operating over 85% capacity. Additionally, two other junctions are close to capacity (85 to 100%), being the A452 Kenilworth Road / Station Road roundabout and the A452/Gipsy Lane junction. The Alder Lane/Kelsey Lane/A452 Junction is operating over capacity.

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

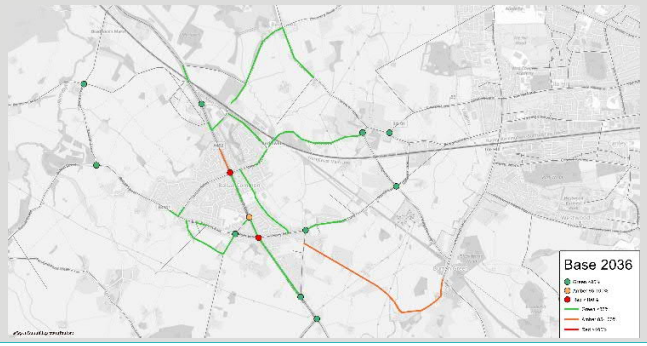
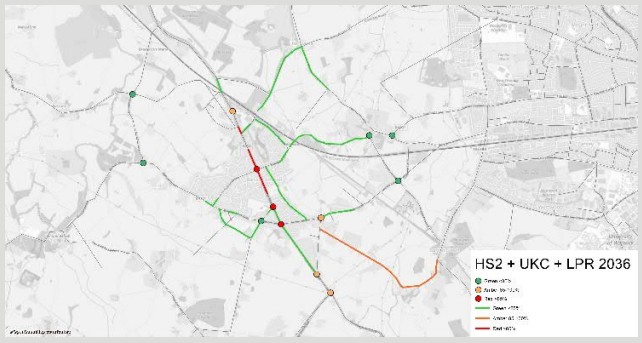
For example, from our site observations, it is clear that the A452 Kenilworth Road suffers from congestion issues from north of the Hallmeadow Road roundabout to the A4177 Meer End Road junction, but this is shown as largely green in Figure 5.1 due to the traffic being slow-moving but not stationary. There are also links that we do not have data for, which could be approaching or already at capacity but cannot be commented on here. Note that these site observations are form 2017, having not been updated due to the COVID-19 pandemic.

Table 5.1: 2026 Development Growth - Capacity Results

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

Source: Mott MacDonald

Table 5.2: 2036 Development Growth - Capacity Results

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

Source: Mott MacDonald

5.3 Summary

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

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

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

Section 6 provides a summary of the challenges identified through this report and Study so far, and presents recommendations for the next phase of work required to reach the goal of mitigating the impact of potential traffic growth on the Balsall Common highway network.

6 Summary of Challenges and Next Steps

6.1 Introduction

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

6.2 Summary of Current and Future Transport Issues and Challenges

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

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

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

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

6.3 Next Steps

The proposed next steps of this study are being undertaken in Balsall Common Stage 3, which will provide a final report detailing:

- the impact of the proposed developments on the highway network
- Potential mitigation measures
- High level sifting and costing of each option
- Final recommendations of options/package which should be taken forward.

A. Detailed On-Site Observations

A.1 Site Visit 1 (26 April 2017)

- Traffic conditions appeared to be worse in the PM peak than the AM peak, with very slow-moving traffic between the A452 Kenilworth Road / Station Road roundabout in the centre of Balsall Common and the A452 Kenilworth Road / B4101 Alder Lane / Kelsey Lane in the south of the village
- Queues clear within the green time on all arms of the A452 Kenilworth Road / B4101 Alder Lane / Kelsey Lane junction in the AM peak, with a maximum queue length of 25 (northbound A452)
- Queues do not clear within the green time on the A452 Kenilworth Road in the PM peak, with queue lengths of 30 or more vehicles on the northbound arm
- Signalised pedestrian crossings, namely that immediately north of the Station Road roundabout, appear to be the root cause of slow-moving northbound traffic
- The signalised A452 / B4101 junction appears to be the root cause of slow-moving southbound traffic
- Traffic flows are much lighter between the Station Road roundabout and the A452 Kenilworth Road / Hallmeadow Road roundabout, although southbound traffic is still reasonably heavy
- Traffic around the station is reasonably light even at peak times, although there is some parking congestion around the Railway Inn public house

A.2 Site Visit 2 (7 June 2017)

- Similar issues to those observed on 26 April 2017 are maintained, although traffic is even heavier this time around
- Queues do not clear within the green time on the A452 Kenilworth Road in the AM peak, with queue lengths of 40 or more vehicles observed on the northbound arm at the end of the peak (08:50 to 09:00). Queues earlier in the peak do not reach these levels, with a maximum queue length of 28 (08:00 to 08:15)
- Queues do not clear within the green time on the A452 Kenilworth Road in the PM peak, with queue lengths of 30 or more vehicles on the southbound arm in the middle of the peak (17:25 to 17:40)
- There is generally heavier traffic than on 26 April between the A452 Northbound and the Station Road roundabout in the PM peak
- Driving from stationary on the A452 Northbound to the A452 / A4177 Meer End Road roundabout took 22 minutes in the PM peak, a journey which should take approximately 5 minutes in free flow conditions
- This same journey in the opposite direction took 12 minutes in the AM peak

B. Base and Future Network Flows

Link and Junction Information					2026 Other Developments						2036 Other Developments			
Ref	Description	Base Year Flow	Movement		HS2 2021 Construction Traffic (vehicles)		HS2 2021 Construction Traffic (HGVs)		UK Central		HS2		UK Central	
					AM	PM	AM	AM	AM	PM	AM	PM	AM	PM
1	A452 Kenilworth Road, south east of the junction with Station Road	2017	N		8	8	8	8	6	36	114	11	12	62
			S		11	11	11	11	131	51	30	108	129	77
2	Holly Lane between Balsall Street East and Honiley Road	2017	N						0	0			0	0
			S						0	0			0	0
3	Hallmeadow Road between junctions with Lavender Hall Lane and Station Road	2017	N						0	0			1	21
			S						17	0			39	0
4	Truggist Lane, to the east of the junction with Baulk Lane	2017	E						0	0			0	0
			W						0	0			0	0
5	Balsall Street, to the west of the junction with Station Road	2017	E						0	0			0	0
			W						0	0			0	0
6	Meeting House Lane	2017	N						0	1			3	2
			S						1	0			5	0
7	Needler's End Lane	2017	E						0	0			0	0
			W						0	0			0	0
8	Frog Lane	2017	E						0	0			0	2
			W						0	0			0	0
9	A452 Kenilworth Road, north of junction with Station Road	2016	N		8	8	8	8	13	176	114	10	24	156
			S		11	11	10	10	177	56	30	108	163	84
10	B4101 Balsall Street East, between junctions with Kemps Green Road and Welby Gate	2017	E						0	0			0	0
			W						0	0			0	0
11	Station Road, south-west of junction with Hallmeadow Road	2017	E						0	0			0	21
			W						17	0			39	0
12	Lavender Hall Lane, south west of junction with Hallmeadow Road.	2017	N						17	0			39	0
			S						0	0			1	21
13	Hob Lane, east of junction with Windmill Lane	2017	E		4	3	4	7	0	0			0	1
			W		4	4	4	11	0	0			0	0
14	Station Road, between junction with B41010 Balsall Street East and Coplow Close	2017	N						0	0			0	0
			S						0	1			0	1
15	Lavender Hall Lane, south-west of junction with Park Lane	2017	N						0	0			0	0
			S						0	0			0	1
16	Gipsy Lane	2017	N						0	0			0	0
			S						0	0			0	0
17	A452 Kenilworth Road, south of Wotton Lane	2017	N		8	8	8	8	13	176	115	11	24	178
			S		26	18	10	11	194	56	30	108	202	84
18	A452 Kenilworth Road, south of Kelsey Lane	2017	N		0	0	0	0	6	37	114	11	12	63
			S		0	0	0	0	189	51	30	108	252	75
19	Lavender Hall Lane North of Park Lane	2014	N		0	0	0	0	0	0			0	0
			S		0	0	0	0	0	0			0	1
20	B4101 Spencers Lane	2015	E						4	132			6	108
			W						0	0			0	0
21	A452 Kenilworth Road, north of Wootton Lane	2018	N		8	8	8	8	13	176	115	11	24	178
			S		26	18	10	11	250	64	30	108	270	94
22	A452 Kenilworth Road, between Gipsy Ln and Alder Ln	2018	N		8	8	8	8	6	37	114	10	12	63
			S		11	11	10	11	131	51	29	108	129	77
23	B4101 Waste Lane, East of Windlmill Lane	2017	E		10	11	11	24	0	0	0	0	3	1
			W		8	8	8	31	0	0	0	0	8	2
24	A452 Kenilworth Road, south of Meer End Road	2017	N		0	0	0	0	0	0	114	10	2	1
			S		0	0	0	0	0	0	30	108	7	2
A	North of junction (A452)	2017	N		8	8	8	8	0	0	115	11	0	0
			S		26	18	10	11	0	0	30	108	0	0
	East of junction (Hallmeadow Road)		E						0	0	1	0	0	0
			W						0	0	0	0	0	0
	South of junction (A452)		N		57	44	8	8	0	0	114	11	0	0
			S		75	54	11	11	0	0	30	108	0	0
B	North of junction (A452)	2017	N		8	8	8	8	13	176	114	10	24	156
			S		11	11	11	11	177	56	30	108	163	84
	East of junction (Station Road)		E						7	140			12	96
			W						46	5			34	7
	South of junction (A452)		N		8	8	8	8	6	36	114	11	12	62
			S		11	11	11	11	131	51	30	108	129	77
	West of Junction (Station Road)		E						0	0			0	0
			W						0	1			0	1
C	North of junction (A452)	2017	N		8	8	8	8	6	37	114	10	12	63
			S		11	11	10	11	131	51	29	108	129	77
	East of junction (Kelsey Lane)		E		10	11	11	24	0	1			0	1
			W		8	8	8	31	0	0			4	2
	South of junction (A452)		N						6	37	114	11	12	63
			S						189	51	30	108	252	75
	West of Junction (Alder Lane)		E						58	0			127	0
			W						0	1			0	1
D	South of junction (A452)	2015	N						6	37	114	10	11	63
			S						189	51	30	108	252	75
	West of Junction (A4177)		E						1	0			1	0
			W						0	0			0	0
	North of junction (A452)		N						6	37	114	11	12	63
			S						189	51	30	108	252	75
E	North of junction (B4101)	2015	N						0	0			0	0
			S						0	0			0	0
	East of junction (Spencer's Lane)		E						0	0			0	0
			W						0	0			0	0
	West of Junction (Spencer's Lane)		E						2	2			3	0
			W						16	5			21	8
F	East of junction (Truggist Lane)	2015	E						3	1			1	1
			W						1	120			1	97
	South of junction (Hodgett's Lane)		N						1	120			2	97
			S						0	0			0	0
	West of Junction (Truggist Lane)		E						0	0			0	0
			W						0	0			1	0

G	East of junction (Nailcote Lane)	2014	E		7	7	6	25	0	0			0	0
			W		4	4	4	29	0	0			0	0
	South of junction (Hodgett's Lane)		N						1	120			2	92
			S						3	1			1	1
	West of Junction (Waste Lane)		E		7	7	6	25	0	0			0	0
			W		4	4	4	29	0	0			0	0
	North of junction (Hodgett's Lane)		N						1	120			2	97
			S						3	1			1	1
H	East of junction (Waste Lane)	2014	E		10	11	11	24	0	0			3	1
			W		8	8	8	31	0	0			8	2
	South of junction (Windmill Lane)		N		4	3	4	16	0	1			1	2
			S		4	4	3	10	1	0			2	0
	West of Junction (Kelsey Lane)		E		10	11	11	24	0	0			0	0
			W		8	8	8	31	0	0			0	0
I	North of junction (A452)	2015	N						6	37	114	11	12	63
			S						189	51	30	108	252	75
	North of junction (Windmill Lane)		N						0	0			0	0
			S						0	0			0	0
	South of junction (A452)		N						6	37	114	11	12	63
			S						189	51	30	108	252	75
J	North of junction (Barston Lane)	2014	N						2	22			5	36
			S						68	2			157	6
	East of junction (Balsall Street)		E						1	4			1	9
			W						60	1			131	2
	South of junction (Magpie Lane)		N						0	0			0	0
			S						0	0			0	0
	West of junction (Balsall Street)		E						8	1			27	4
			W						1	18			4	28
K	North of junction (Bradnocks Marsh Lane)	2014	N						1	26			6	43
			S						8	1			26	5
	East of junction (Wootton Lane)		E						1	20			4	30
			W						0	0			0	0
	South of junction (Barston Lane)		N						2	22			5	36
			S						68	2			157	6
	West of Junction (Barston Lane)		E						1	16			3	24
			W						96	1			161	1
L	North of junction (A452)	2017	N		8	8	8	8	6	36	114	11	12	62
			S		11	11	10	11	131	51	30	108	129	77
	South of junction (A452)		N		8	8	8	8	6	37	114	10	12	63
			S		11	11	10	11	131	51	29	108	129	77
	West of junction (Gipsy Lane)		E						0	0			0	0
			W						0	1			0	2
M	North of junction (Gipsy Lane)	2017	N						0	0			0	0
			S						0	1			0	2
	East of junction (Alder Lane)		E						0	1			0	1
			W						58	0			127	0
	South of junction (Holly Lane)		N						0	0			0	0
			S						0	0			0	0
	West of junction (Balsall Street East)		E						0	2			0	3
			W						58	0			127	0

C. HS2 and UK Central Trip Generations

Link and Junction Information					2026 Other Developments						2036 Other Developments			
Ref	Description	Base Year Flow	Movement		HS2 2021 Construction Traffic (vehicles)		HS2 2021 Construction Traffic (HGVs)		UK Central		HS2		UK Central	
					AM	PM	AM	AM	AM	PM	AM	PM	AM	PM
1	A452 Kenilworth Road, south east of the junction with Station Road	2017	N		8	8	8	8	6	36	114	11	12	62
			S		11	11	11	11	131	51	30	108	129	77
2	Holly Lane between Balsall Street East and Honiley Road	2017	N						0	0			0	0
			S						0	0			0	0
3	Hallmeadow Road between junctions with Lavender Hall Lane and Station Road	2017	N						0	0			1	21
			S						17	0			39	0
4	Truggist Lane, to the east of the junction with Baulk Lane	2017	E						0	0			0	0
			W						0	0			0	0
5	Balsall Street, to the west of the junction with Station Road	2017	E						0	0			0	0
			W						0	0			0	0
6	Meeting House Lane	2017	N						0	1			3	2
			S						1	0			5	0
7	Needler's End Lane	2017	E						0	0			0	0
			W						0	0			0	0
8	Frog Lane	2017	E						0	0			0	2
			W						0	0			0	0
9	A452 Kenilworth Road, north of junction with Station Road	2016	N		8	8	8	8	13	176	114	10	24	156
			S		11	11	10	10	177	56	30	108	163	84
10	B4101 Balsall Street East, between junctions with Kemps Green Road and Welby Gate	2017	E						0	0			0	0
			W						0	0			0	0
11	Station Road, south-west of junction with Hallmeadow Road	2017	E						0	0			0	21
			W						17	0			39	0
12	Lavender Hall Lane, south west of junction with Hallmeadow Road.	2017	N						17	0			39	0
			S						0	0			1	21
13	Hob Lane, east of junction with Windmill Lane	2017	E		4	3	4	7	0	0			0	1
			W		4	4	4	11	0	0			0	0
14	Station Road, between junction with B41010 Balsall Street East and Coplow Close	2017	N						0	0			0	0
			S						0	1			0	1
15	Lavender Hall Lane, south-west of junction with Park Lane	2017	N						0	0			0	0
			S						0	0			0	1
16	Gipsy Lane	2017	N						0	0			0	0
			S						0	0			0	0
17	A452 Kenilworth Road, south of Wotton Lane	2017	N		8	8	8	8	13	176	115	11	24	178
			S		26	18	10	11	194	56	30	108	202	84
18	A452 Kenilworth Road, south of Kelsey Lane	2017	N		0	0	0	0	6	37	114	11	12	63
			S		0	0	0	0	189	51	30	108	252	75
19	Lavender Hall Lane North of Park Lane	2014	N		0	0	0	0	0	0			0	0
			S		0	0	0	0	0	0			0	1
20	B4101 Spencers Lane	2015	E						4	132			6	108
			W						0	0			0	0
21	A452 Kenilworth Road, north of Wootton Lane	2018	N		8	8	8	8	13	176	115	11	24	178
			S		26	18	10	11	250	64	30	108	270	94
22	A452 Kenilworth Road, between Gipsy Ln and Alder Ln	2018	N		8	8	8	8	6	37	114	10	12	63
			S		11	11	10	11	131	51	29	108	129	77
23	B4101 Waste Lane, East of Windlmill Lane	2017	E		10	11	11	24	0	0	0	0	3	1
			W		8	8	8	31	0	0	0	0	8	2
24	A452 Kenilworth Road, south of Meer End Road	2017	N		0	0	0	0	0	0	114	10	2	1
			S		0	0	0	0	0	0	30	108	7	2
A	North of junction (A452)	2017	N		8	8	8	8	0	0	115	11	0	0
			S		26	18	10	11	0	0	30	108	0	0
	East of junction (Hallmeadow Road)		E						0	0	1	0	0	0
			W						0	0	0	0	0	0
	South of junction (A452)		N		57	44	8	8	0	0	114	11	0	0
			S		75	54	11	11	0	0	30	108	0	0
B	North of junction (A452)	2017	N		8	8	8	8	13	176	114	10	24	156
			S		11	11	11	11	177	56	30	108	163	84
	East of junction (Station Road)		E						7	140			12	96
			W						46	5			34	7
	South of junction (A452)		N		8	8	8	8	6	36	114	11	12	62
			S		11	11	11	11	131	51	30	108	129	77
	West of Junction (Station Road)		E						0	0			0	0
			W						0	1			0	1
C	North of junction (A452)	2017	N		8	8	8	8	6	37	114	10	12	63
			S		11	11	10	11	131	51	29	108	129	77
	East of junction (Kelsey Lane)		E		10	11	11	24	0	1			0	1
			W		8	8	8	31	0	0			4	2
	South of junction (A452)		N						6	37	114	11	12	63
			S						189	51	30	108	252	75
	West of Junction (Alder Lane)		E						58	0			127	0
			W						0	1			0	1
D	South of junction (A452)	2015	N						6	37	114	10	11	63
			S						189	51	30	108	252	75
	West of Junction (A4177)		E						1	0			1	0
			W						0	0			0	0
	North of junction (A452)		N						6	37	114	11	12	63
			S						189	51	30	108	252	75
E	North of junction (B4101)	2015	N						0	0			0	0
			S						0	0			0	0
	East of junction (Spencer's Lane)		E						0	0			0	0
			W						0	0			0	0
	West of Junction (Spencer's Lane)		E						2	2			3	0
			W						16	5			21	8
F	East of junction (Truggist Lane)	2015	E						3	1			1	1
			W						1	120			1	97
	South of junction (Hodgett's Lane)		N						1	120			2	97
			S						0	0			0	0
	West of Junction (Truggist Lane)		E						0	0			0	0
			W						0	0			1	0

G	East of junction (Nailcote Lane)	2014	E		7	7	6	25	0	0			0	0
			W		4	4	4	29	0	0			0	0
	South of junction (Hodgett's Lane)		N						1	120			2	92
			S						3	1			1	1
	West of Junction (Waste Lane)		E		7	7	6	25	0	0			0	0
			W		4	4	4	29	0	0			0	0
	North of junction (Hodgett's Lane)		N						1	120			2	97
			S						3	1			1	1
H	East of junction (Waste Lane)	2014	E		10	11	11	24	0	0			3	1
			W		8	8	8	31	0	0			8	2
	South of junction (Windmill Lane)		N		4	3	4	16	0	1			1	2
			S		4	4	3	10	1	0			2	0
	West of Junction (Kelsey Lane)		E		10	11	11	24	0	0			0	0
			W		8	8	8	31	0	0			0	0
I	North of junction (A452)	2015	N						6	37	114	11	12	63
			S						189	51	30	108	252	75
	North of junction (Windmill Lane)		N						0	0			0	0
			S						0	0			0	0
	South of junction (A452)		N						6	37	114	11	12	63
			S						189	51	30	108	252	75
J	North of junction (Barston Lane)	2014	N						2	22			5	36
			S						68	2			157	6
	East of junction (Balsall Street)		E						1	4			1	9
			W						60	1			131	2
	South of junction (Magpie Lane)		N						0	0			0	0
			S						0	0			0	0
	West of junction (Balsall Street)		E						8	1			27	4
			W						1	18			4	28
K	North of junction (Bradnocks Marsh Lane)	2014	N						1	26			6	43
			S						8	1			26	5
	East of junction (Wootton Lane)		E						1	20			4	30
			W						0	0			0	0
	South of junction (Barston Lane)		N						2	22			5	36
			S						68	2			157	6
	West of Junction (Barston Lane)		E						1	16			3	24
			W						96	1			161	1
L	North of junction (A452)	2017	N		8	8	8	8	6	36	114	11	12	62
			S		11	11	10	11	131	51	30	108	129	77
	South of junction (A452)		N		8	8	8	8	6	37	114	10	12	63
			S		11	11	10	11	131	51	29	108	129	77
	West of junction (Gipsy Lane)		E						0	0			0	0
			W						0	1			0	2
M	North of junction (Gipsy Lane)	2017	N						0	0			0	0
			S						0	1			0	2
	East of junction (Alder Lane)		E						0	1			0	1
			W						58	0			127	0
	South of junction (Holly Lane)		N						0	0			0	0
			S						0	0			0	0
	West of junction (Balsall Street East)		E						0	2			0	3
			W						58	0			127	0

D. TRICS Outputs

TRICS 7.4.1
Trip Rate Parameter: Number of pupils

Filtering Summary
Land Use 04/A EDUCATION/PRIMARY

Selected Trip Rate Calculation Parameter Range 92-447 PUPILS

Actual Trip Rate Calculation Parameter Range 147-184 PUPILS

Date Range Minimum: 01/01/09 Maximum: 20/05/14

Days of the week selected Tuesday 1
Friday 1

Main Location Types selected Suburban Area (PPS6 Out of Centre) 1
Edge of Town 1

Population <1 Mile ranges selected 1 001 to 5 0 1
15 001 to 20 0 1

Population <5 Mile ranges selected 5 001 to 25 0 1
50 001 to 75 0 1

Car Ownership <5 Mile ranges selected 1.1 to 1.5 2

PTAL Rating No PTAL Present 2

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use 04 - EDUCATION
Category A - PRIMARY
MULTI-MODAL VEHICLES

Selected regions and areas:
7 YORKSHIRE & NORTH LINCOLNSHIRE
NE NORTH EAST LINCOL 1 days
10 WALES
MT MERTHYR TYDFIL 1 days
This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.
Parameter: Number of pupils
Actual Range: 147 to 184 (units:)
Range Selected by User: 92 to 447 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/09 to 20/05/14

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.
Selected survey days:
Tuesday 1 days
Friday 1 days
This data displays the number of selected surveys by day of the week.

Selected survey types:
Manual count 2 days
Directional ATC Count 0 days
This data displays the number of manual classifiec the total adding up to the overall nu whilst ATC surveys are undertaking using machines.

Selected Locations:
Town Centre 0
Edge of Town Centre 0
Suburban Area (PPS6 Out of Centre) 1
Edge of Town 1
Neighbourhood Centre (PPS6 Local Centre) 0
Free Standing (PPS6 Out of Town) 0
Not Known 0
This data displays the number of surveys per main Edge of Town Suburban Area Neighbourhood Centre Edge of Town Centre Town Centre and Not Known.

Selected Location Sub Categories:
Industrial Zone 0
Commercial Zone 0
Development Zone 0
Residential Zone 2
Retail Zone 0
Built-Up Zone 0
Village 0
Out of Town 0
High Street 0
No Sub Category 0
This data displays the number of surveys per locat Industrial Zone Development Zone Residential Zone Retail Zone Built-Up Zone Village Out of Town High Street and No Sub Category.

Secondary Filtering selection:

Use Class:
D1 2 days
This data displays the number of surveys per Use which can be found within the Library module of TRICS®.

Population within 1 mile:
1,001 to 5,000 1 days
15,001 to 20,000 1 days
This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:
5,001 to 25,000 1 days
50,001 to 75,000 1 days
This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:
1.1 to 1.5 2 days
This data displays the number of selected surveys within a radius of 5-miles of selected survey sites.

Travel Plan:
No 2 days
This data displays the number of surveys within th and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:
No PTAL Present 2 days
This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

Site(1):	MT-04-A-01	Gross floor area:	1000 sqm	
Development Name:	PRIMARY SCHOOL	Number of pupils:		184
Location:	MERTHYR TYDFIL			
Postcode:	CF47 8RE	Number of Employees:		26
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:		18/10/2013
Sub-Location Type:	Residential Zone	Survey Day:	Friday	
PTAL:	n/a	Parking Spaces:		20
Site(2):	NE-04-A-01	Gross floor area:	625 sqm	
Development Name:	PRIMARY SCHOOL	Number of pupils:		147
Location:	SCUNTHORPE			
Postcode:	DN17 2TD	Number of Employees:		22
Main Location Type:	Edge of Town	Survey Date:		20/05/2014
Sub-Location Type:	Residential Zone	Survey Day:	Tuesday	
PTAL:	n/a	Parking Spaces:		14

This section provides a list of all survey sites and d it displays a unique site reference co the selected trip rate the day of the week and and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY
Calculation Factor: 1 PUPILS
Count Type: VEHICLES

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00-01:00									
01:00-02:00									
02:00-03:00									
03:00-04:00									
04:00-05:00									
05:00-06:00									
06:00-07:00									
07:00-08:00	2	166	0.054	2	166	0.027	2	166	0.081
08:00-09:00	2	166	0.353	2	166	0.296	2	166	0.649
09:00-10:00	2	166	0.036	2	166	0.039	2	166	0.075
10:00-11:00	2	166	0.009	2	166	0.009	2	166	0.018
11:00-12:00	2	166	0.033	2	166	0.033	2	166	0.066
12:00-13:00	2	166	0.018	2	166	0.021	2	166	0.039
13:00-14:00	2	166	0.027	2	166	0.042	2	166	0.069
14:00-15:00	2	166	0.027	2	166	0.021	2	166	0.048
15:00-16:00	2	166	0.193	2	166	0.208	2	166	0.401
16:00-17:00	2	166	0.082	2	166	0.088	2	166	0.17
17:00-18:00	2	166	0	2	166	0.024	2	166	0.024
18:00-19:00	1	147	0	1	147	0.007	1	147	0.007
19:00-20:00									
20:00-21:00									
21:00-22:00									
22:00-23:00									
23:00-24:00									
Daily Trip Rates:			0.832			0.815			1.647

Parameter summary

Trip rate parameter range selected:	147 - 184 (units:)
Survey date date range:	01/01/09 - 20/05/14
Number of weekdays (Monday-Friday):	2
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

TRICS 7.4.1

Trip Rate Parameter:	Number of dwellings				
Filtering Summary					
Land Use	03/A	RESIDENTIAL/HOUSES PRIVATELY OWNED			
Selected Trip Rate Calculation Parameter Range	6-491 DWELLS				
Actual Trip Rate Calculation Parameter Range	23-151 DWELLS				
Date Range	Minimum: 01/01/09	Maximum: 29/11/16			
Days of the week selected	Monday	3			
	Tuesday	2			
	Wednesday	1			
	Thursday	2			
	Friday	2			
Main Location Types selected	Suburban Area (PPS6 Out of Centre)	5			
	Edge of Town	5			
Population <1 Mile ranges selected	1 001 to 5	0	3		
	5 001 to 10	0	2		
	10 001 to 15	0	5		
Population <5 Mile ranges selected	5 001 to 25	0	4		
	25 001 to 50	0	2		
	75 001 to 100	0	4		
Car Ownership <5 Mile ranges selected	1.1 to 1.5	10			
PTAL Rating	No PTAL Present	10			

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use 03 - RESIDENTIAL
Category A - HOUSES PRIVATELY OWNED
MULTI-MODAL VEHICLES

Selected regions and areas:

2	SOUTH EAST		
HC		HAMPSHIRE	1 days
WS		WEST SUSSEX	1 days
3	SOUTH WEST		
DV		DEVON	2 days
6	WEST MIDLANDS		
SH		SHROPSHIRE	1 days
7	YORKSHIRE & NORTH LINCOLNSHIRE		
NY		NORTH YORKSHIRE	4 days
8	NORTH WEST		
CH		CHESHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation

Parameter:	Number of dwellings
Actual Range:	23 to 151 (units:)
Range Selected by User:	6 to 491 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/09 to 29/11/16

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.
Selected survey days:

Monday	3 days
Tuesday	2 days
Wednesday	1 days
Thursday	2 days
Friday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	10 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the nu the total adding up to the overall nu whilst ATC surveys are undertaking using machines.

Selected Locations:

Town Centre	0
Edge of Town Centre	0
Suburban Area (PPS6 Out of Centre)	5
Edge of Town	5
Neighbourhood Centre (PPS6 Local Centre)	0
Free Standing (PPS6 Out of Town)	0
Not Known	0

This data displays the number of surveys per main location category v Edge of Town Suburban Area Neighbourhood Centre Edge of Town Centre Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	0
Commercial Zone	0
Development Zone	0
Residential Zone	9
Retail Zone	0
Built-Up Zone	0
Village	0
Out of Town	0
High Street	0
No Sub Category	1

This data displays the number of surveys per location sub-category wi Industrial Zone Development Zone Residential Zone Retail Zone Built-Up Zone Village Out of High Street and N

Secondary Filtering selection:

Use Class:

C3	10 days

This data displays the number of surveys per Use Class classification v which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000	3 days
5,001 to 10,000	2 days
10,001 to 15,000	5 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	4 days
25,001 to 50,000	2 days

75,001 to 100,000 4 days
This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:
1.1 to 1.5 10 days
This data displays the number of selected surveys within stated range within a radius of 5-miles of selected survey sites.

Travel Plan:
Yes 2 days
No 8 days
This data displays the number of surveys within the selected set that and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:
No PTAL Present 10 days
This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

Site(1):	CH-03-A-09	Site area:	0.73 hect	
Development Name:	TERRACED HOUSES	Number of dwellings:		24
Location:	MACCLESFIELD	Housing density:		39
Postcode:	SK10 2NS	Total Bedrooms:		72
Main Location Type:	Edge of Town	Survey Date:		24/11/2014
Sub-Location Type:	Residential Zone	Survey Day:	Monday	
PTAL:	n/a	Parking Spaces:		32
Site(2):	DV-03-A-02	Site area:	4.04 hect	
Development Name:	HOUSES & BUNGALOWS	Number of dwellings:		116
Location:	HONITON	Housing density:		44
Postcode:	EX14 1JB	Total Bedrooms:		306
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:		25/09/2015
Sub-Location Type:	Residential Zone	Survey Day:	Friday	
PTAL:	n/a	Parking Spaces:		261
Site(3):	DV-03-A-03	Site area:	2.02 hect	
Development Name:	TERRACED & SEMI DETACHED	Number of dwellings:		70
Location:	HONITON	Housing density:		50
Postcode:	EX14 2DF	Total Bedrooms:		208
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:		28/09/2015
Sub-Location Type:	Residential Zone	Survey Day:	Monday	
PTAL:	n/a	Parking Spaces:		116
Site(4):	HC-03-A-18	Site area:	1.40 hect	
Development Name:	HOUSES & FLATS	Number of dwellings:		62
Location:	LIPHOOK	Housing density:		46
Postcode:	GU30 7TG	Total Bedrooms:		205
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:		29/11/2016
Sub-Location Type:	Residential Zone	Survey Day:	Tuesday	
PTAL:	n/a	Parking Spaces:		136
Site(5):	NY-03-A-06	Site area:	5.23 hect	
Development Name:	BUNGALOWS & SEMI DET.	Number of dwellings:		115
Location:	BOROUGHBRIDGE	Housing density:		28
Postcode:	YO51 9NF	Total Bedrooms:		220
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:		14/10/2011
Sub-Location Type:	Residential Zone	Survey Day:	Friday	
PTAL:	n/a	Parking Spaces:		402
Site(6):	NY-03-A-09	Site area:	3.30 hect	
Development Name:	MIXED HOUSING	Number of dwellings:		52
Location:	NORTHALLERTON	Housing density:		18
Postcode:	DL6 1BQ	Total Bedrooms:		152
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:		16/09/2013
Sub-Location Type:	Residential Zone	Survey Day:	Monday	
PTAL:	n/a	Parking Spaces:		135
Site(7):	NY-03-A-10	Site area:	2.21 hect	
Development Name:	HOUSES AND FLATS	Number of dwellings:		71
Location:	RIPON	Housing density:		48
Postcode:	HG4 1UH	Total Bedrooms:		138
Main Location Type:	Edge of Town	Survey Date:		17/09/2013
Sub-Location Type:	No Sub Category	Survey Day:	Tuesday	
PTAL:	n/a	Parking Spaces:		59
Site(8):	NY-03-A-11	Site area:	1.79 hect	
Development Name:	PRIVATE HOUSING	Number of dwellings:		23
Location:	BOROUGHBRIDGE	Housing density:		15
Postcode:	YO51 9LQ	Total Bedrooms:		101
Main Location Type:	Edge of Town	Survey Date:		18/09/2013
Sub-Location Type:	Residential Zone	Survey Day:	Wednesday	
PTAL:	n/a	Parking Spaces:		144
Site(9):	SH-03-A-05	Site area:	1.32 hect	
Development Name:	SEMI-DETACHED/TERRACED	Number of dwellings:		54
Location:	TELFORD	Housing density:		56
Postcode:	TF7 4JE	Total Bedrooms:		162
Main Location Type:	Edge of Town	Survey Date:		24/10/2013
Sub-Location Type:	Residential Zone	Survey Day:	Thursday	
PTAL:	n/a	Parking Spaces:		63
Site(10):	WS-03-A-04	Site area:	5.45 hect	
Development Name:	MIXED HOUSES	Number of dwellings:		151
Location:	HORSHAM	Housing density:		46
Postcode:	RH12 1EP	Total Bedrooms:		465
Main Location Type:	Edge of Town	Survey Date:		11/12/2014
Sub-Location Type:	Residential Zone	Survey Day:	Thursday	
PTAL:	n/a	Parking Spaces:		345

This section provides a list of all survey sites and days in the selected it displays a unique site reference cc the selected trip rate the day of the week and and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
Calculation Factor: 1 DWELLS
Count Type: VEHICLES

	ARRIVALS				DEPARTURES				TOTALS
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	Rate
00:00-01:00									
01:00-02:00									
02:00-03:00									
03:00-04:00									
04:00-05:00									
05:00-06:00									
06:00-07:00									
07:00-08:00	10	74	0.087	10	74	0.29	10	74	0.377
08:00-09:00	10	74	0.122	10	74	0.352	10	74	0.474
09:00-10:00	10	74	0.157	10	74	0.153	10	74	0.31
10:00-11:00	10	74	0.152	10	74	0.187	10	74	0.339
11:00-12:00	10	74	0.145	10	74	0.152	10	74	0.297
12:00-13:00	10	74	0.161	10	74	0.154	10	74	0.315
13:00-14:00	10	74	0.175	10	74	0.145	10	74	0.32
14:00-15:00	10	74	0.144	10	74	0.173	10	74	0.317
15:00-16:00	10	74	0.213	10	74	0.141	10	74	0.354
16:00-17:00	10	74	0.241	10	74	0.159	10	74	0.4
17:00-18:00	10	74	0.341	10	74	0.154	10	74	0.495

18:00-19:00		10	74	0.215	10	74	0.144	10	74	0.359
19:00-20:00										
20:00-21:00										
21:00-22:00										
22:00-23:00										
23:00-24:00										
Daily Trip Rates:				2.153			2.204			4.357

Parameter summary

Trip rate parameter range selected:	23 - 151 (units:)	
Survey date date range:	01/01/09 - 29/11/16	
Number of weekdays (Monday-Friday):		10
Number of Saturdays:		0
Number of Sundays:		0
Surveys automatically removed from selection:		1
Surveys manually removed from selection:		3

E. Local Plan Review Sites Trip Generations

Link and Junction Information					2026 Local Plan Review Sites																2036 Local Plan Review Sites															
Ref	Description	Base Year Flow	Movement		Barretts Farm Residential		Windmill Lane Residential		Frog Lane Residential		Lavender Hall Farm Residential		Trevallion Stud Residential		Pheasant Oak Farm Residential		Barretts Farm Primary School		All LPR Sites		Barretts Farm Residential		Windmill Lane Residential		Frog Lane Residential		Lavender Hall Farm Residential		Trevallion Stud Residential		Pheasant Oak Farm Residential		Barretts Farm Primary School		All LPR Sites	
					AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	A452 Kenilworth Road, south east of the junction with Station Road	2017	N		0	0	15	5			0	0	1	6	0	0	0	0	17	11	112	38	15	5			1	6	4	17	26	9	65	7	193	50
			S		0	0	5	14			0	0	6	1	0	0	0	0	11	15	33	103	5	14			7	1	19	4	8	23	70	5	108	121
2	Holly Lane between Balsall Street East and Honiley Road	2017	N						1	4									1	4					1	4									1	4
			S						5	1									5	1					5	1									5	1
3	Hallmeadow Road between junctions with Lavender Hall Lane and Station Road	2017	N		0	0					0	0	1	4			0	0	1	4							1	4	4	11					0	0
			S		0	0					0	0	4	2			0	0	4	2							4	2	12	2					0	0
4	Truggist Lane, to the east of the junction with Baulk Lane	2017	E		0	0					0	0	4	2			0	0	4	2							4	2	12	2					0	0
			W		0	0					0	0	1	4			0	0	1	4							1	4	4	11					0	0
5	Balsall Street, to the west of the junction with Station Road	2017	E		0	0	6	10	5	10					0	0	0	0	11	20	40	76	6	10	5	10	2	3			9	17	85	3	136	99
			W		0	0	11	6	10	6					0	0	0	0	22	12	83	46	11	6	10	6	4	2			19	11	48	9	153	67
6	Meeting House Lane	2017	N																0	0															0	0
			S																0	0															0	0
7	Needler's End Lane	2017	E																0	0															0	0
			W																0	0															0	0
8	Frog Lane	2017	E																0	0															0	0
			W																0	0															0	0
9	A452 Kenilworth Road, north of junction with Station Road	2016	N				15	5	14	5	0	0	1	6	0	0	15		46	16	112	38	15	5	14	5	3	10	4	3	26	9	65	7	207	55
			S				5	14	4	13	0	0	6	1	0	0	5		20	28	33	103	5	14	4	13	10	4	19	17	8	23	70	5	112	134
10	B4101 Balsall Street East, between junctions with Kemps Green Road and Welby Gate	2017	E				6	10	21	6					0	0			26	17	40	76	6	10	21	6					9	17	85	3	152	96
			W				11	6	6	19					0	0			17	25	83	46	11	6	6	19					19	11	48	9	149	80
11	Station Road, south-west of junction with Hallmeadow Road	2017	E		0	0											0	0	0	0															0	0
			W		0	0											0	0	0	0															0	0
12	Lavender Hall Lane, south west of junction with Hallmeadow Road.	2017	N								0	0							0	0							2	5							0	0
			S								0	0							0	0							5	2							0	0
13	Hob Lane, east of junction with Windmill Lane	2017	E																0	0															0	0
			W																0	0															0	0
14	Station Road, between junction with B41010 Balsall Street East and Coplow Close	2017	N		0	0			14	5							0	0	14	5					14	5	2	3							14	5
			S		0	0			4	13							0	0	4	13					4	13	4	2							4	13
15	Lavender Hall Lane, south-west of junction with Park Lane	2017	N								0	0	4	2					4	2							4	2	12	2					0	0
			S								0	0	1	4					1	4							1	4	4	11					0	0
16	Gipsy Lane	2017	N																0	0															0	0
			S																0	0															0	0
17	A452 Kenilworth Road, south of Wotton Lane	2017	N		0	0	15	5	14	5	0	0	17	7	0	0	0	0	47	17	112	38	15	5	14	5	14	11	19	47	26	9	65	7	207	55
			S		0	0	5	14	4	13	0	0	6	16	0	0	0	0	15	43	33	103	5	14	4	13	5	14	51	22	8	23	70	5	112	134
18	A452 Kenilworth Road, south of Kelsey Lane	2017	N		0	0			1	4	0	0	1	6			0	0	2	10					1	4	1	6	4	17	3	15			1	4
			S		0	0			5	1	0	0	6	1			0	0	11	2					5	1	7	1	19	4	17	4			5	1
19	Lavender Hall Lane North of Park Lane	2014	N								0	0	4	2					4	2							4	2	12	2					0	0
			S								0	0	1	4					1	4							1	4	4	11					0	0
20	B4101 Spencers Lane	2015	E								0	0	2	1					2	1							4	2	6	1					0	0
			W								0	0	1	2					1	2							1	4	2	6					0	0
21	A452 Kenilworth Road, north of Wootton Lane	2018	N		0	0	15	5	14	5	0	0	17	7	0	0	0	0	47	17	112	38	15	5	14	5	14	11	19	47	26	9	65	7	266	122
			S		0	0	5	14	4	13	0	0	6	16	0	0	0	0	15	43	33	103	5	14	4	13	5	14	51	22	8	23	70	5	176	193
22	A452 Kenilworth Road, between Gipsy Ln and Alder Ln	2018	N		0	0	15	5			0	0	1	6	0	0	0	0	17	11	112	38	15	5			1	6	4	17	26	9	65	7	223	82
			S		0	0	5	14			0	0	6	1	0	0	0	0	11	15	33	103	5	14			7	1	19	4	8	23	70	5	141	150
23	B4101 Waste Lane, East of Windlmill Lane	2017	E		0	0	13	5	12	4	0	0			0	0	0	0	25	9	182	280	13	5	12	4					22	8	246	17	474	315
			W		0	0	4	12	4	11	0	0			0	0	0	0	8	23	299	186	4	12	4	11					7	20	215	23	529	251
24	A452 Kenilworth Road, south of Meer End Road	2017	N		0	0	2	9	1	4	0	0	1	6	0	0	0	0	4	19	14	66	2	9	1	4	1	6	4	17	3	15	30	3	55	121
			S		0	0	10	2	5	1	0	0	6	1	0	0	0	0	21	5	72	16	10	2	5	1	7	1	19	4	17	4	42	3	171	32
A	North of junction (A452)	2017	N		0	0	15	5	14	5	0	0	4	13	0	0	0	0	33	23	112	38	15	5	14	5	14	11	12	26	26	9	65	7	207	55
			S		0	0	5	14	4	13	0	0	15	5	0	0	0	0	23	31	33	103	5	14	4	13	5	14	44	27	8	23	70	5	112	134
	East of junction (Hallmeadow Road)		E		0	0					0	0	8	3			0	0	8	3							6	19	25	9					0	0
			W		0	0					0	0	3	8			0	0	3	8							19	13	8	23					0	0
	South of junction (A452)		N				15	5	14	5	0	0	1	6	0	0			31	16	112	38	15	5	14	5	2	5	4	3	26	9	65	7	207	55
			S				5	14	4	13	0	0	6	1	0	0			15	28	33	103	5	14	4	13	5	2	19	17	8	23	70	5	112	134
B	North of junction (A452)	2017	N				15	5	14	5	0	0	1	6	0	0			31	16	112	38	15	5	14	5	3	10	4	3	26	9	65	7	207	55
			S				5	14	4	13	0	0	6	1	0	0			15	28	33	103	5	14	4	13	10	4	19	17	8	23	70	5	112	134
	East of junction (Station Road)		E		0	0											0	0	0	0															0	0
			W		0	0											0	0	0	0															0	0
	South of junction (A452)		N		0	0	15	5			0	0	1	6	0	0	0	0	17	11	112	38	15	5			1	6	4	3	26	9	70	5	198	48
			S		0	0	5	14			0	0	6	1	0	0	0	0	11	15	33	103	5	14			7	1	19	17	8	23	65	7	103	124
	West of Junction (Station Road)		E		0	0			14	5							0	0	14	5					14	5	2	3							14	5
			W		0	0			4	13							0	0	4	13					4	13	4	2							4	13
C	North of junction (A452)	2017	N		0	0	15	5			0	0	1	6	0	0	0	0	17	11	112	38	15	5			1	6	4	3	26	9	70	3	198	46
			S		0	0	5	14			0	0	6	1	0	0	0	0	11	15	33	103	5	14			7	1	19	17	8	23	65	7	103	124
	East of junction (Kelsey Lane)		E		0	0	10	24	12	4					0	0	0	0	22	29	73	179	10	24	12	4					17	41	150	10	245	218
			W		0	0	27	12	4	11					0	0	0	0	31	22	196	84	27	12	4	11					45	19	119	12	345	118
	South of junction (A452)		N						1	4	0	0	1	6					2	10					1	4	1	6	4	17					1	4
			S						5	1	0	0	6	1					11	2					5	1	7	1	19	4					5	1
	West of Junction (Alder Lane)		E				6	10	16	5					0	0			22	16	40	76	6	10	16	5					9	17	85	3	147	95
			W				11	6	5	15					0	0			16	21	83	46	11	6	5	15					19	11	48	9	148	76
D	South of junction (A452)	2015	N		0	0	2	9	1	4	0	0	1	6	0	0	0	0	4	19	14	66	2	9	1	4	1	6	4	17	3	15	30	3	47	82
			S		0	0	10	2	5	1	0	0	6	1	0	0	0	0	21	5	72	16	10	2	5	1	7	1	19	4	17	4	42	3	129	23
	West of Junction (A4177)		E																0	0															0	0
			W																0	0															0	0
	North of junction (A452)		N		0	0	2	9	1	4	0	0	1	6	0	0	0	0	4	19	14	66	2	9	1	4	1	6	4	17	3	15	30	3	47	82
			S		0	0	10	2	5	1	0	0	6	1	0	0	0	0	21	5	72	16	10	2	5	1	7	1	19	4	17	4	42	3	129	23
E	North of junction (B4101)	2015	N		0	0					0	0	2	1			0	0	2	1							2	1	6	1					0	0
			S		0	0					0	0	1	2			0	0	1	2							1	2	2	6					0	0
	East of junction (Spencer's Lane)		E								0	0	2	1					2	1							2	1	6	1					0	0
			W								0	0	1	2					1	2							1	2	2	6					0	0
	West of Junction (Spencer's Lane)		E		0	0					0	0	4	2			0	0	4	2							4	2	12	2					0	0
			W		0	0					0	0	1	4			0	0	1	4							1	4	4	11					0	0
F	East of junction (Truggist Lane)	2015	E		0	0					0	0	4	2			0	0	4	2							2	1	12	2					0	0
			W		0	0					0	0	1	4			0	0	1	4							1	2	4	11					0	0
	South of junction (Hodgett's Lane)		N								0	0							0	0							2	1							0	0
			S								0	0							0	0							1	2							0	0
	West of Junction (Truggist Lane)		E		0	0					0	0	4	2			0	0	4	2							4	2	12	2					0	0
			W		0	0					0	0	1	4			0	0	1	4							1	4	4	11					0	0

G	East of junction (Nailcote Lane)	2014	E				13	5	12	4				0	0			25	9	94	35			12	4					22	8	54	7	161	46
			W				4	12	4	11				0	0			8	23	31	86			4	11					7	20	65	4	100	101
	South of junction (Hodgett's Lane)		N															0	0															0	0
			S															0	0															0	0
	West of Junction (Waste Lane)		E				13	5	12	4				0	0			25	9	94	35	13	5	12	4					22	8	54	7	173	51
			W				4	12	4	11				0	0			8	23	31	86	4	12	4	11					7	20	65	4	104	112
	North of junction (Hodgett's Lane)		N															0	0															0	0
			S															0	0															0	0
H	East of junction (Waste Lane)	2014	E				13	5	12	4				0	0			25	9	87	245	13	5	12	4					20	56	186	11	298	265
			W				4	12	4	11				0	0			8	23	268	100	4	12	4	11					61	23	155	19	431	142
	South of junction (Windmill Lane)		N				40	16						0	0			40	16	14	66	40	16							3	15	30	3	84	85
			S				14	36						0	0			14	36	72	16	14	36							17	4	42	3	129	56
	West of Junction (Kelsey Lane)		E				10	24	12	4				0	0			22	29	73	179	10	24	12	4					17	41	156	8	251	215
			W				27	12	4	11				0	0			31	22	196	84	27	12	4	11					45	19	113	16	339	122
I	North of junction (A452)	2015	N		0	0			1	4		1	6			0	0	2	10															0	0
			S		0	0			5	1		6	1			0	0	11	2															0	0
	North of junction (Windmill Lane)		N				2	9						0	0			2	9	14	66	2	9							3	15	30	3	46	78
			S				10	2						0	0			10	2	72	16	10	2							17	4	42	3	124	22
	South of junction (A452)		N		0	0	2	9	1	4		1	6	0	0	0	0	4	19	14	66	2	9	0	0	1	6	0	0	3	15	30	3	46	78
			S		0	0	10	2	5	1		6	1	0	0	0	0	21	5	72	16	10	2	0	0	7	1	0	0	17	4	42	3	124	22
J	North of junction (Barston Lane)	2014	N															0	0															0	0
			S															0	0															0	0
	East of junction (Balsall Street)		E		0	0	6	10	5	10				0	0	0	0	11	20	40	76	6	10	5	10	4	7			9	17	85	3	136	99
			W		0	0	11	6	10	6				0	0	0	0	22	12	83	46	11	6	10	6	8	4			19	11	48	9	153	67
	South of junction (Magpie Lane)		N															0	0															0	0
			S															0	0															0	0
	West of junction (Balsall Street)		E		0	0	6	10	5	10				0	0	0	0	11	20	40	76	6	10	5	10	4	7			9	17	85	3	136	99
			W		0	0	11	6	10	6				0	0	0	0	22	12	83	46	11	6	10	6	8	4			19	11	48	9	153	67
K	North of junction (Bradnocks Marsh Lane)	2014	N															0	0															0	0
			S															0	0															0	0
	East of junction (Wootton Lane)		E															0	0															0	0
			W															0	0															0	0
	South of junction (Barston Lane)		N															0	0															0	0
			S															0	0															0	0
	West of Junction (Barston Lane)		E															0	0															0	0
			W															0	0															0	0
L	North of junction (A452)	2017	N		0	0	15	5			0	0	1	6	0	0	0	0	17	11	112	38	15	5			1	6	4	17	26	9	70	5	198	48
			S		0	0	5	14			0	0	6	1	0	0	0	0	11	15	33	103	5	14			7	1	19	4	8	23	65	7	103	124
	South of junction (A452)		N		0	0	15	5			0	0	1	6	0	0	0	0	17	11	112	38	15	5			1	6	4	17	26	9	70	5	198	48
			S		0	0	5	14			0	0	6	1	0	0	0	0	11	15	33	103	5	14			7	1	19	4	8	23	65	7	103	124
	West of junction (Gipsy Lane)		E																																		
			W		0	0										0	0	0	0															0	0
M	North of junction (Gipsy Lane)	2017	N		0	0										0	0	0	0															0	0
			S		0	0										0	0	0	0															0	0
	East of junction (Alder Lane)		E		0	0	6	10	4	11						0	0	9	21	40	76	6	10	4	11							48	9	98	106
			W		0	0	11	6	12	4						0	0	23	11	83	46	11	6	12	4							85	3	192	60
	South of junction (Holly Lane)		N		0	0			1	4						0	0	1	4					1	4									1	4
			S		0	0			5	1						0	0	5	1					5	1									5	1
	West of junction (Balsall Street East)		E		0	0	6	10	8	12						0	0	14	22	40	76	6	10	8	12							85	3	139	102
			W				11	6	13	9								24	15	83	46	11	6	13	9							48	9	156	70

F. Adjusted Capacities at Junctions

F.1 Introduction

The DMRB method for calculating capacity values at links has been refined in the case of junctions. It is acknowledged that due to the various conflicting movements occurring at junctions, capacity levels at these points are affected by a number of elements. Broadly speaking, these elements can be summarised as:

- Turning movements;
- Pedestrian crossings; and
- Signalised junctions.

With the aim of better reflecting reality, capacity levels at junctions have been calculated by applying reduction factors that account for these elements.

The purpose of this section is to therefore to describe the methodology used to derive adjusted capacity values at the assessed junctions.

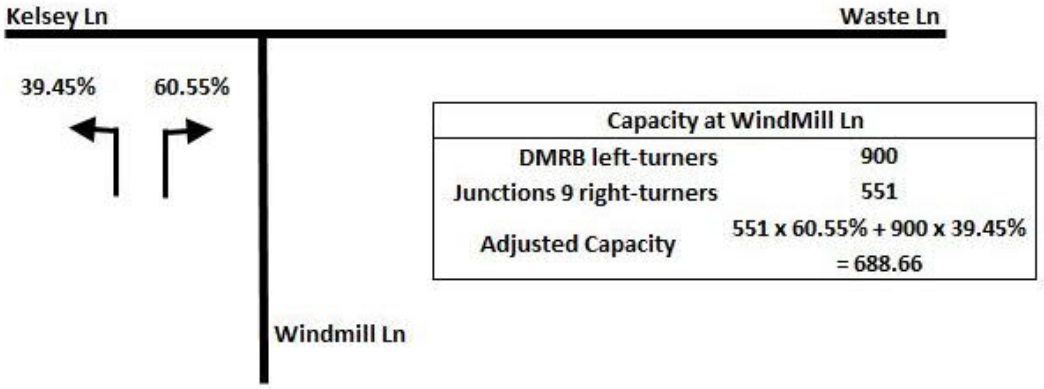
F.2 Priority Junctions

Traffic flows at priority junctions are affected by turning vehicles which consequently produce delays and conflicts. This is especially true at T-junctions and crossroads where vehicles travelling along a single lane road, approach a junction and must wait for the vehicles ahead to manoeuvre. In this case, queues form downstream reducing the theoretical capacity of the link. To account for this, the following approach has been followed:

1. Calculate DMRB link capacity values at a given arm
2. Obtain capacity values from Junction 9 software, both for ahead movements and right turners
3. Calculate the adjusted capacity at the approach considering the proportion of traffic making the ahead movement and the turning movement. This data was obtained from the turning counts surveys described in Section 2.4.3.

To illustrate this, Figure 6.1 shows an example for the calculation at Junction H (see Appendix H).

Figure 6.1: Adjusted Capacity for Junction HFigure



Source: Mott MacDonald

This approach to calculate adjusted capacities was followed for Junctions D, F, G, H, I, J, K and M (see Appendix G).

F.3 Pedestrian Crossings

Traffic flows are affected at signalised pedestrian crossings by the amount of green time that they are given. The theoretical capacity at that particular link will be reduced by vehicles waiting for a green light. The proportion of green time given to vehicles was estimated and then the capacity figures were adjusted by multiplying them for the calculated green time proportion.

Pedestrian crossings which affect the capacity levels at junctions within the assessment area were only found at Junctions B and L (see Appendix H). To illustrate the methodology, the following example shows the calculations for Junction B where a pedestrian crossing is found north of the A452 / Station Road roundabout.

- DMRB capacity on the north approach: 1,140 veh/hr
- Proportion of green time for vehicles: 80%
- Adjusted capacity on the north approach: 1,140 x 0.80 = 912 veh/hr

F.4 Signalised Junctions

To obtain realistic capacity levels at signalised junctions, estimates were based on controller specifications provided by the client team. Intergreens, cycles times and stages were identified to calculate what percentage of green time would be reserved for each arm.

Junction C was the only junction where capacity levels were estimated based on this method. The calculations carried out can be illustrated with following example:

- Capacity on the eastern approach: 1,925 veh/hr
- Green time estimated based on controller specifications: 24s
- Cycle time estimated based on controller specifications: 120s
- Proportion of green time for vehicles: 20% (24s percentage out of 120s)
- Adjusted capacity on the eastern approach: 1,925 x 0.20 = 385 veh/hr

G. Link Analysis Results

Link and Junction Information													
Ref	Description	Base Year Flow	Movement		Base_2020	Base_2026	Base_2036	HS2_2026	HS2_2036	HS2_UKC_2026	HS2_UKC_2036	HS2_UKC_LPR_2026	HS2_UKC_LPR_2036
1	A452 Kenilworth Road, south east of the junction with Station Road	2017	N S		73%	77%	80%	78%	90%	85%	91%	86%	109%
2	Holly Lane between Balsall Street East and Honiley Road	2017	N S		26%	28%	29%	28%	29%	28%	29%	28%	29%
3	Hallmeadow Road between junctions with Lavender Hall Lane and Station Road	2017	N S		12%	13%	13%	13%	13%	13%	13%	13%	13%
4	Truggist Lane, to the east of the junction with Baulk Lane	2017	E W		18%	19%	20%	19%	20%	19%	20%	19%	20%
5	Balsall Street, to the west of the junction with Station Road	2017	E W		28%	29%	30%	29%	30%	29%	30%	30%	41%
6	Meeting House Lane	2017	N S		9%	9%	10%	9%	10%	10%	10%	10%	10%
7	Needler's End Lane	2017	E W		42%	44%	45%	44%	45%	44%	45%	44%	45%
8	Frog Lane	2017	E W		3%	3%	3%	3%	3%	3%	3%	3%	3%
9	A452 Kenilworth Road, north of junction with Station Road	2016	N S		86%	90%	94%	92%	106%	110%	113%	112%	132%
10	B4101 Balsall Street East, between junctions with Kemps Green Road and Welby Gate	2017	E W		42%	45%	46%	45%	46%	45%	46%	47%	63%
11	Station Road, south-west of junction with Hallmeadow Road	2017	E W		9%	10%	10%	10%	10%	10%	13%	10%	13%
12	Lavender Hall Lane, south west of junction with Hallmeadow Road.	2017	N S		15%	16%	16%	16%	16%	16%	17%	16%	17%
13	Hob Lane, east of junction with Windmill Lane	2017	E W		86%	90%	94%	91%	94%	91%	94%	91%	94%
14	Station Road, between junction with B41010 Balsall Street East and Coplow Close	2017	N S		20%	21%	21%	21%	21%	21%	21%	21%	22%
15	Lavender Hall Lane, south-west of junction with Park Lane	2017	N S		23%	24%	25%	24%	25%	24%	25%	24%	25%
16	Gipsy Lane	2017	N S		19%	20%	21%	20%	21%	20%	21%	20%	21%
17	A452 Kenilworth Road, south of Wotton Lane	2017	N S		71%	75%	77%	78%	88%	86%	96%	88%	109%
18	A452 Kenilworth Road, south of Kelsey Lane	2017	N S		51%	54%	55%	54%	63%	57%	68%	57%	68%
19	Lavender Hall Lane North of Park Lane	2014	N S		20%	21%	22%	21%	22%	21%	22%	21%	22%
20	B4101 Spencers Lane	2015	E W		39%	41%	42%	41%	42%	54%	53%	54%	53%
21	A452 Kenilworth Road, north of Wootton Lane	2018	N S		31%	32%	33%	33%	37%	35%	40%	37%	46%
22	A452 Kenilworth Road, between Gipsy Ln and Alder Ln	2018	N S		42%	44%	46%	46%	53%	49%	58%	50%	68%
23	B4101 Waste Lane, East of Windlmill Lane	2017	E W		31%	33%	35%	35%	35%	35%	35%	37%	77%
24	A452 Kenilworth Road, south of Meer End Road	2017	N S		48%	50%	52%	50%	60%	50%	61%	51%	63%

H. Junction Analysis Results

Link and Junction Information														
Ref	Description	Base Year Flow	Movement	Base_2020	Base_2026	Base_2036	HS2_2026	HS2_2036	HS2_UKC_2026	HS2_UKC_2036	HS2_UKC_LPR_2026	HS2_UKC_LPR_2036
A	North of junction (A452) East of junction (Hallmeadow Road) South of junction (A452)	2017	N S E W N S	64%	68%	70%	73%	79%	73%	79%	75%	95%
B	North of junction (A452) East of junction (Station Road) South of junction (A452) West of Junction (Station Road)	2017	N S E W N S E W	92%	97%	101%	99%	114%	112%	115%	113%	137%
C	North of junction (A452) East of junction (Kelsey Lane) South of junction (A452) West of Junction (Alder Lane)	2017	N S E W N S E W	103%	109%	112%	119%	112%	119%	133%	125%	172%
D	South of junction (A452) West of Junction (A4177) North of junction (A452)	2015	N S E W N S	68%	72%	75%	72%	87%	75%	88%	77%	93%
E	North of junction (B4101) East of junction (Spencer's Lane) West of Junction (Spencer's Lane)	2015	N S E W E W	43%	45%	47%	45%	47%	45%	47%	46%	47%
F	East of junction (Truggist Lane) South of junction (Hodgett's Lane) West of Junction (Truggist Lane)	2015	E W N S E W	21%	22%	23%	22%	23%	43%	40%	43%	40%
G	East of junction (Nailcote Lane) South of junction (Hodgett's Lane) West of Junction (Waste Lane) North of junction (Hodgett's Lane)	2014	E W N S E W N S	60%	63%	65%	63%	65%	63%	66%	63%	66%
H	East of junction (Waste Lane) South of junction (Windmill Lane) West of Junction (Kelsey Lane)	2014	E W N S E W	50%	53%	55%	56%	55%	56%	56%	58%	89%
I	North of junction (A452) North of junction (Windmill Lane) South of junction (A452)	2015	N S N S N S	71%	74%	77%	74%	86%	78%	91%	79%	92%
J	North of junction (Barston Lane) East of junction (Balsall Street) South of junction (Magpie Lane) West of junction (Balsall Street)	2014	N S E W N S E W	33%	34%	36%	34%	36%	34%	36%	36%	49%
K	North of junction (Bradnocks Marsh Lane) East of junction (Wootton Lane) South of junction (Barston Lane) West of Junction (Barston Lane)	2014	N S E W N S E W	11%	12%	12%	12%	12%	17%	26%	17%	26%
L	North of junction (A452) South of junction (A452) West of junction (Gipsy Lane)	2017	N S N S E W	90%	96%	99%	98%	103%	115%	119%	116%	132%
M	North of junction (Gipsy Lane) East of junction (Alder Lane) South of junction (Holly Lane) West of junction (Balsall Street East)	2017	N S E W N S E W	50%	52%	54%	52%	54%	52%	54%	54%	66%

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