



Royal Windsor and Maidenhead

ROYAL WINDSOR AND MAIDENHEAD LOCAL PLAN ASSESSMENT

Using RBWM Strategic Highway Model





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TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

PROJECT NO. 70041562

OUR REF. NO. LBB/ PH

DATE: OCTOBER 2019

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft for RBWM comment	Draft for RBWM comment	Updated to address RBWM comments	
Date	September 2019	October 2019	October 2019	
Prepared by	Lucy Burton-Brown Peter Holman	Lucy Burton-Brown	Lucy Burton-Brown	
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Authorised by				
Signature				
Project number	70041562	70041562	70041562	
Report number				
File reference	a:\projects\700415xx\70041562 - application of rbwm-hm2\02 wip\development\03 document\015 - update of the lp work\restore\rbwm strategic highway model report_v7.docx			

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1 SETTING THE SCENE

1.1 INTRODUCTION

- 1.1.1. The Royal Borough of Windsor and Maidenhead (RBWM) is currently in the process of updating its Borough Local Plan (BLP), which will set out the vision, objectives and spatial strategy for the borough up to 2033.
- 1.1.2. Following the Regulation 19 publication stage (June – September 2017), the BLP, together with all supporting documents and any comments that had been received, was submitted to the Secretary of State on 31 January 2018 for examination by an independent Inspector. Among other documents, the BLP submission included the “RBWM Local Plan Assessment Using RBWM Strategic Highway Model”, June 2017, which presented an assessment of the likely impact of the emerging BLP on the highway network.
- 1.1.3. Since December 2018 the BLP Examination has been in a pause period whilst the RBWM undertake a number of workstreams that have been requested by the Inspector including:
- Review of housing need;
 - Review of employment need and policies;
 - Review of site selection process and the allocated sites;
 - Reviewing Regulation 20 representations;
 - Re-focus on placemaking principles; and
 - Review of policies on affordable housing, heritage and housing mix and type.
- 1.1.4. In response to this, the transport assessment completed in June 2017 has been revisited. This document presents the results of the updated assessment of the impact of the emerging Local Plan housing and employment development sites on the highway network in the borough.

1.2 EVIDENCE BASE

- 1.2.1. The RBWM Strategic Highway Model 2 (RBWM-HM2) has been used as the basis for the assessment. The base year of the RBWM-HM2 is 2016 and the model was developed to represent an average weekday AM peak hour (08:00 - 09:00) and PM peak hour (17:00 - 18:00).
- 1.2.2. The model development has been guided by the following units of the DfT’s TAG guidance:
- Unit M1 “Principles of Modelling and Forecasting” (January 2014);
 - Unit M1.2 “Data Sources and Surveys” (January 2014); and
 - Unit M3.1 “Highway Assignment Modelling” (January 2014).
- 1.2.3. The RBWM-HM2 has been developed using PTV’s VISUM 15.00-08.
- 1.2.4. The performance of the base year highway model was examined by comparing modelled and observed counts on links, screenlines and at junctions, as well as journey times along selected routes.
- 1.2.5. The RBWM-HM2 base year model development and performance is described in the “RBWM - Highway Model 2. Local Model Validation Report”, June 2017. The report concluded that RBWM-HM2 is a robust tool suitable to be used for traffic forecasting and scheme assessment.
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- 1.2.6. The RBWM-HM2 base year model was used as the basis for developing the forecast scenarios presented in this report.

1.3 PURPOSE AND STRUCTURE OF REPORT

- 1.3.1. This report forms part of a transport evidence base for the assessment of the housing and employment development sites in the RBWM Local Plan. The report describes the potential impact of the Local Plan development on the highway network, and identifies junctions where mitigation may be required. The report is intended to provide confidence on the deliverability of the Local Plan in terms of transport, and to inform the associated Infrastructure Delivery Plan.

- 1.3.2. The report covers the following chapters:

- Chapter 2 - Forecasting approach;
 - Chapter 3 and Chapter 4 - Forecast results; and
 - Chapter 5 - Summary and conclusions.
-

2 FORECASTING APPROACH

2.1 FORECAST SCENARIOS

- 2.1.1. Three forecast scenarios have been developed to analyse the impact of the allocated housing and employment up to 2033, the end of the Local Plan period:
- Scenario A: includes planned development outside the borough and committed development in the borough but does not include the Local Plan development in the borough;
 - Scenario B: based on Scenario A but also includes Local Plan development in the borough; and
 - Scenario C: based on Scenario B but also includes transport interventions that may be required to mitigate the impact of the Local Plan developments.

2.2 SCENARIO A

- 2.2.1. Scenario A was prepared representing the 2033 AM peak and PM peak highway conditions. Scenario A provides a future case with baseline conditions representing the minimum projected development in the intervening years. In this case it represents a scenario devoid of any Local Plan sites and only includes:
- Planned development outside the borough;
 - Committed dwellings within the borough; and
 - Committed jobs within the borough.
- 2.2.2. Planned development outside the borough was accounted for in the model through the use of national projections.
- 2.2.3. Car growth was obtained from TEMPRO version 7.2, a software tool that provides projections of growth over time based on outputs from the National Trip End Model (NTEM). NTEM considers changes in population, employment, car ownership and trip rates to forecast the growth in trip origins and destinations. It does not allow for changes in travel times, perceived value of time, cost of fuel, and other car operating costs.
- 2.2.4. NTEM version 7.2 datasets were published on 1 March 2017 and were the latest available set of forecasts at the time the forecast models were completed. 2033 planning projections included within TEMPRO v7.2 for the Local Authorities adjacent to the RBWM are reproduced in Table 2.1.
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Table 2.1 TEMPRO planning projections

Locality	Households			Jobs		
	2016	2033	2016-2033 Growth	2016	2033	2016-2033 Growth
Bracknell Forest	48,481	55,436	6,955	70,725	75,206	4,481
Slough	53,929	59,822	5,893	88,201	93,647	5,446
Wokingham	64,757	87,576	22,819	82,142	87,298	5,156
South Bucks	27,868	30,307	2,439	38,783	41,192	2,409
Wycombe	71,209	82,436	11,227	94,828	100,383	5,555
Runnymede	34,258	38,992	4,734	58,623	62,091	3,468
Spelthorne	41,122	45,439	4,317	48,372	51,231	2,859
Surrey Heath	35,314	41,477	6,163	51,723	54,864	3,141

- 2.2.5. Growth for Light Goods Vehicles (LGV) and Heavy Goods Vehicles (HGV) was obtained from the National Road Traffic Forecasts (NRTF) published by the DfT (September 2018). These growth rates were applied to each region depending on the RBWM-HM2 zone locations. The regional growth factors are shown in Table 2.2.

Table 2.2 National Road Traffic Forecast growth factors

Region	LGV Growth	HGV Growth
East Midlands	25.2%	0.0%
Eastern England	23.7%	6.8%
London	28.7%	0.3%
North East	25.7%	-0.9%
North West	23.6%	0.0%
South East	25.2%	7.4%
South West	22.8%	-0.8%
West Midlands	27.1%	1.0%
Yorks & Humber	25.0%	1.0%
Wales	24.3%	-0.2%
Scotland	24.1%	-0.2%

- 2.2.6. NTEM forecasts do not take account of the detailed geographical location of development sites. Instead, information on housing and employment committed developments, which has been provided by RBWM Council, was used to quantify growth within the borough.
- 2.2.7. The committed developments in the borough between 2016 and 2033 are broken down by development classification in Table 2.3, and are displayed graphically in Figure 2.1. Since employment commitments were provided in terms of floorspace, the conversion factors from Homes and Communities Agency, Employment Density Guide 3rd Edition (November 2015) were used to calculate the number of jobs. The conversion factors for each land use class are shown in Table 2.4.

Table 2.3 Total housing and employment committed development 2016-2033

	Committed Development
Housing	3,031 dwellings
Employment	1,111 jobs

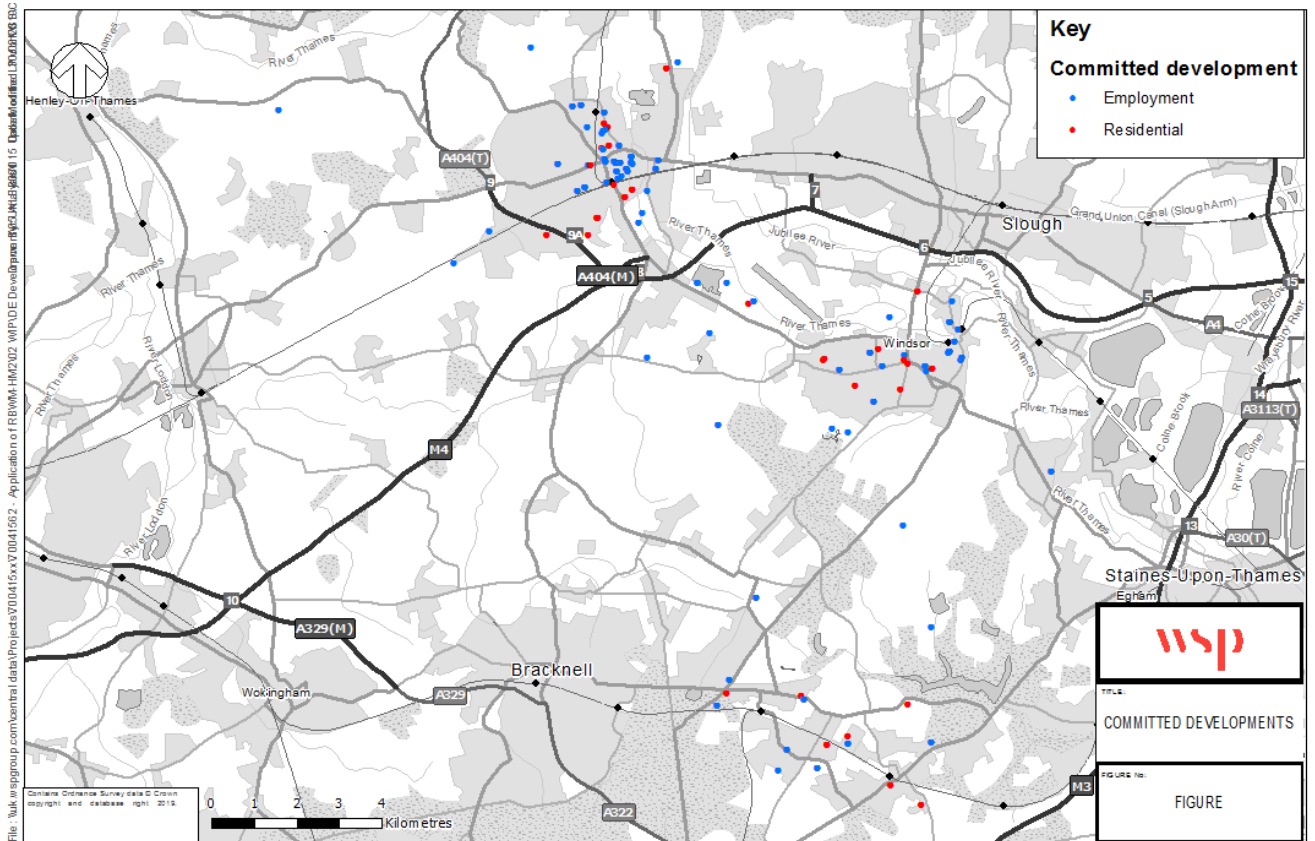


Figure 2.1 Committed dwellings and employment sites

Table 2.4 Employment density

Use Class	Area per Full Time Equivalent jobs
A1, food	17.5 sqm
A1, non-food	17.5 sqm
A2	16 sqm
A3	17.5 sqm
A4	17.5 sqm
B1	12 sqm
B2	36 sqm
B8	77 sqm
C1	3 bed
C2	3 bed
D1, non-resi	36 sqm
D2, Leisure Centre	65 sqm
D2, Cinema	200 sqm
Sui generis	36 sqm

- 2.2.8. The full list of committed developments in the borough is provided in Appendix A. Negative values for the development quantum indicate a change in land use. For example, the New Lodge on Drift Road in Winkfield is being redeveloped from office space (use class B1) to housing.
- 2.2.9. To calculate the trip generation arising from the committed developments within the borough, trip rates were applied to the development quantum for each site. The trip rates have been determined from a selection of representative sites in the TRICS trip generation database. TRICS is the UK and Ireland's national system of trip generation analysis, containing over 7,150 directional transport surveys at over 110 types of development. Sites were generally selected based on the following criteria:
- Regions: South East (excluding Greater London), South West, East Anglia
 - Dates: since June 2013
 - Survey days: Monday, Tuesday, Wednesday, Thursday
 - Survey types: manual count, directional ATC count, and
 - Locations: edge of town centre, suburban area, edge of town
- 2.2.10. In instances where this did not generate a suitable range of sites, one or more of the above criteria was relaxed. For example, in the last five years no cinema sites were surveyed on the above weekdays, so survey data from a Friday was used.
- 2.2.11. The car and LGV trips rates for each land use class are provided in Table 2.5, and the HGV trip rates for each land use class are provided in Table 2.6.
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Table 2.5 TRICS® development trip rates, car and LGV (vehicles)

Development type	AM Peak Hour (0800-0900)			PM Peak Hour (1700-1800)		
	Arrival	Departure	Total	Arrival	Departure	Total
Food Retail (A1) per 100sqm	2.64	2.14	4.77	6.23	6.89	13.11
Non Food Retail (A1) per 100sqm	0.20	0.04	0.25	1.57	1.62	3.19
Financial and Profesional Services (A2) per 100sqm	2.20	0.19	2.39	0.23	1.98	2.22
Restaurant & Café (A3) per 100sqm	0.00	0.00	0.00	2.68	0.83	3.51
Drinking Establishments (A4) per 100sqm	0.00	0.00	0.00	1.35	0.54	1.88
Business (B1) per 100sqm	1.53	0.16	1.69	0.17	1.30	1.46
General Industry (B2) per 100sqm	0.51	0.19	0.70	0.10	0.49	0.59
Storage or Distribution (B8) per 100sqm	0.07	0.06	0.13	0.04	0.09	0.14
Hotels (C1) per bed	0.33	0.91	1.24	0.59	0.28	0.86
Dwelling Houses (C3) per unit	0.17	0.41	0.58	0.36	0.16	0.51
Dwelling Flats (C3) per unit	0.06	0.18	0.25	0.19	0.10	0.29
Non-Residential Institutions (D1) per sqm	6.75	3.60	10.36	3.47	4.64	8.11
Primary School (D1) per pupil	0.70	0.58	1.28	0.04	0.08	0.11
Secondary School (D1) per pupil	0.11	0.08	0.19	0.02	0.03	0.05
Leisure Centre (D2) per sqm	0.25	0.27	0.52	1.01	0.70	1.71
Cinema (D2) per sqm	0.00	0.00	0.00	1.10	1.04	2.14
Sports Hub (D2) per pitch	1.30	0.70	2.00	2.30	0.80	3.10
Residential Institutions i.e. Nursing homes per bed	0.09	0.08	0.17	0.07	0.12	0.19
Braywick Leisure centre per parking space	0.43	0.33	0.76	0.90	0.79	1.69

Table 2.6 TRICS® development trip rates, HGV (vehicles)

Development type	AM Peak Hour (0800-0900)			PM Peak Hour (1700-1800)		
	Arrival	Departure	Total	Arrival	Departure	Total
Food Retail (A1) per 100sqm	0.02	0.06	0.08	0.01	0.02	0.03
Non Food Retail (A1) per 100sqm	0.00	0.00	0.00	0.00	0.00	0.00
Financial and Profesional Services (A2) per 100sqm	0.01	0.01	0.01	0.00	0.00	0.00
Restaurant & Café (A3) per 100sqm	0.00	0.00	0.00	0.00	0.00	0.00
Drinking Establishments (A4) per 100sqm	0.00	0.00	0.00	0.00	0.00	0.00
Business (B1) per 100sqm	0.02	0.01	0.03	0.00	0.00	0.01
General Industry (B2) per 100sqm	0.02	0.01	0.03	0.01	0.01	0.01
Storage or Distribution (B8) per 100sqm	0.01	0.01	0.03	0.02	0.01	0.03
Hotels (C1) per bed	0.01	0.01	0.02	0.00	0.00	0.00
Dwelling Houses (C3) per unit	0.00	0.00	0.00	0.00	0.00	0.00
Dwelling Flats (C3) per unit	0.00	0.00	0.00	0.00	0.00	0.00
Non-Residential Institutions (D1) per sqm	0.00	0.00	0.00	0.00	0.00	0.00
Primary School (D1) per pupil	0.00	0.00	0.00	0.00	0.00	0.00
Secondary School (D1) per pupil	0.00	0.00	0.00	0.00	0.00	0.00
Leisure Centre (D2) per sqm	0.01	0.01	0.02	0.00	0.00	0.00
Cinema (D2) per sqm	0.00	0.00	0.00	0.00	0.00	0.00
Sports Hub (D2) per pitch	0.10	0.10	0.20	0.00	0.00	0.00
Residential Institutions i.e. Nursing homes per bed	0.00	0.00	0.00	0.00	0.00	0.00
Braywick Leisure centre per parking space	0.02	0.06	0.08	0.01	0.02	0.03

2.2.12. Operating costs vary by vehicle type and values of time vary by the purpose of the trip being made. This means that different combinations of vehicle and user may choose different routes through the network. The car and LGV trip generation was therefore divided between the four model user classes (car commute, car business, car other, LGV) using the proportions from the base year matrix totals, which are shown in Table 2.7 below.

Table 2.7 User class proportions

Time period	Car commuting	Car business	Car other	LGV
AM peak	0.63	0.08	0.17	0.13
PM peak	0.65	0.07	0.17	0.11

- 2.2.13. The trip generation arising from the committed developments was used to calculate the growth forecast for each existing base year zone. The trip distribution (the trip origins and destinations) for the committed developments was based on the trip distribution of the underlying base year zones.
- 2.2.14. A number of committed developments which exceed a certain threshold (sites with over 100 dwellings or 400 jobs) were modelled explicitly and allocated a new model zone. The explicitly modelled committed developments are listed in Table 2.8 below.

Table 2.8 Explicitly modelled committed developments

Address	Type	Size
Development at King Street and Queen Street and Broadway Maidenhead	Mixed use	344 dwellings 8,946 sqm
York Road Redevelopment Area York Road Maidenhead	Mixed use	229 dwellings 1,146 sqm
Land West of Crown Lane Including Part Hines Meadow Car Park and La Roche and The Colnade High Street Maidenhead	Mixed use	163 dwellings 2,395 sqm
Windsor Business Quarter 67 Alma Road Windsor	Mixed use	217 dwellings 16,535 sqm
Former Buildings Including Units and Cottages at Water Oakley Farm Windsor Road Water Oakley Windsor	Residential	127 dwellings
Desborough Bowling Club York Road Maidenhead SL6 1SF	Residential	154 dwellings
Former Park and Ride Car Park Land Stafferton Way Maidenhead (The Loftings)	Residential	293 dwellings
Kings Chase 107-123 King Street Maidenhead SL6 1DP	Employment	5,580 sqm

- 2.2.15. The trip distribution (the trip origins and destinations) for the explicitly modelled committed developments was based on the trip distribution of existing neighbouring zones with similar land uses.
- 2.2.16. The overall growth outside and within the borough was constrained to NTEM forecasts and NRTF factors. The 'Alternative Planning Assumptions' facility within TEMPRO was used to ensure forecasts were consistent with RBWM trajectories.
- 2.2.17. To account for the effect of changes in fuel and income on car trips, fuel and income adjustments were applied using the DfT's TAG Databook, May 2019 release v1.12. The factors are shown in Table 2.9, and the resultant growth is shown in Table 2.10.

Table 2.9 Fuel and income adjustment factors

Adjustment	2016	2033
Fuel	1.069	1.124
Income	1.014	1.048

Table 2.10 Fuel and income growth

Growth	2016 - 2033
Fuel & income	1.087

2.2.18. A range of committed infrastructure schemes have been included in Scenario A, including:

- M4 junctions 3-12: smart motorway:

“This scheme will use the latest technology to improve journeys by monitoring traffic flow and setting speed limits accordingly. This helps to keep traffic moving smoothly, instead of continually stopping and starting. Information about road conditions and speed limits will be displayed to drivers on electronic road signs. The proposal also involves converting the hard shoulder permanently to a traffic lane. This will create much needed extra capacity necessary to support economic growth. The conversion of the hard shoulder will be continuous through junctions unless there is an operational reason not to do so. It is proposed that the new lane created from the hard shoulder would continue through junctions 4, 5, 6, 7, 8/9 and 11. It is not proposed this for junctions 3 and 12 or at junctions 4b and 10, as these are motorway to motorway links. To enable the provision of a smart motorway along the whole length of the proposed scheme, it will be necessary to widen or replace a number of bridges where there is currently no hard shoulder.”¹

- Impact of Crossrail (See Table 2.11):

Crossrail is planned to have a terminus in Maidenhead. This will undoubtedly be beneficial to the economic vitality of Maidenhead. It is envisaged that Crossrail may have little impact on mode shift in Maidenhead as in Berkshire Crossrail generally replaces existing train services. However, there may be a local reassignment of highway trips. For example, people who live in Wokingham or Bracknell may be tempted to drive to Twyford or Maidenhead and go on a direct Crossrail train to the City or Docklands, rather than going via Waterloo and then on the tube. The likely increase in highway trips to Maidenhead station is included in the forecasts.

¹ Source: Highways England <http://roads.highways.gov.uk/projects/m4-junctions-3-12-smart-motorway/>

Table 2.11 Impact of Crossrail

Trips	AM peak (8-9)	PM peak (17-18)
2016-2033 additional number of trips to the station	204	29
2016-2033 additional number of trips from the station	24	199

Source: The number of additional trips to and from the station in 2033 has been estimated from patronage forecasts provided by Crossrail.

- Committed junction improvements in Maidenhead, including A308/ Broadway (complete), Queen Street/ King Street, Braywick Roundabout, A4 Bridge Road/ Ray Mead Road, A4 Bridge Road/ Oldfield Road, A4 Castle Hill/ A308 and A4/ B4447 Cookham Road.
- Committed speed changes in Maidenhead; and
- Committed junction improvements in Slough, including the A355 Tuns Lane/ Chippenham Lane roundabout, A355 Farnham Road/ Shinfield Road, A4 Wellington Street/ A412 Uxbridge Road roundabout and Windsor Road corridor improvements.

2.2.19. Planned changes to car parks in Maidenhead town centre, including the closure of the Grove Road and Town Hall car parks and the part demolition of Hines Meadow car park, were also considered in Scenario A. The trip generation associated with these car parking spaces was transferred to alternative town centre car parks, including the new Vicus Way car park, to reflect changes in car parking capacity.

2.2.20. The full list of committed infrastructure schemes included in Scenario A is shown in Appendix B.

2.2.21. The Joint Minerals and Waste Plan (JMWP), which was produced by the Central & Eastern Berkshire Authorities (Bracknell Forest Council, Reading Borough Council, Wokingham Borough Council and RBWM), has also been considered to ensure planned minerals and waste sites are accounted for. Most of the potential development sites are on the periphery of the modelled area, except for The Compound at Stubbings Estate and Monkey Island Lane Wharf at Bray. The draft JMWP concludes that whilst the potential change in traffic flows at The Compound is unknown due to lack of information on possible tonnages, it is likely to be neutral if similar to comparable sites. The JMWP also states that the proposed new barge facility at Monkey Island Lane Wharf would result in a net reduction in HGV movements. For these reasons the sites have not been explicitly modelled in the Local Plan assessment.

2.3 SCENARIO B

2.3.1. Scenario B is based on Scenario A but also includes Local Plan development in the borough.

2.3.2. The Local Plan development in the borough between 2016 and 2033 is broken down by development classification in Table 2.12, and is displayed graphically in Figure 2.2. The individual site details are provided in Appendix C. Braywick Park (AL15) has been included as a committed development, and Land south of Ray Mill Road East (AL27) and Land north of Lutman Lane, Spencer's Farm (AL28) are green space allocations with no development, so these sites are not included in the list.

Table 2.12 Local plan development 2016-2033

	Local Plan development
Housing, dwellings	7,956
Employment, sqm	218,179
School, pupils	1,770



Figure 2.2 Emerging Local Plan housing and employment sites

- 2.3.3. The “Local Plan Viability Update”, April 2017, was used to determine the split between houses and flats for residential sites. The report developed a set of typologies to reflect the variety of development situations typical in the south of England. The Local Plan sites were matched to the appropriate typology and the number of houses and flats was calculated based on the corresponding proportions.
- 2.3.4. The Local Plan sites were modelled explicitly. The trip rates shown in Table 2.5 and Table 2.6 were used to calculate the trip generation for each site, and the proportions shown in Table 2.7 were used to split the car and LGV trip generation into the separate user classes. It should be noted that these trip rates do not take account of the potential mode shift which could be delivered through the placemaking work, and therefore represent a worst-case scenario.
- 2.3.5. The trip distribution (the trip origins and destinations) for Local Plan sites was generally based on the trip distribution of existing neighbouring zones with similar land uses.

- 2.3.6. The Desborough site (HA57) includes 2,600 dwellings as well as a primary school, a secondary school and a local centre. The residential development has been modelled as two separate zones; a zone to the north of the site including 600 flats, and a zone to the south of the site including 1,234 flats and 766 houses.
- 2.3.7. The trip generation for the Desborough site has been produced using a separate set of trip rates taken from the Golf Course assessment that WSP previously undertook in January 2016². This is to maintain consistency with the Golf Course assessment work. These trip rates are shown in Table 2.13 below.

Table 2.13 Desborough site trip rates (vehicles)

Development type	AM Peak Hour (0800-0900)			PM Peak Hour (1700-1800)		
	Arrival	Departure	Total	Arrival	Departure	Total
Dwelling Houses (C3) per unit	0.15	0.39	0.54	0.36	0.22	0.59
Dwelling Flats (C3) per unit	0.05	0.20	0.25	0.17	0.07	0.24
Primary School (D1) per pupil	0.26	0.16	0.42	0.03	0.04	0.07
Secondary School (D1) per pupil	0.14	0.08	0.22	0.02	0.03	0.06

- 2.3.8. The provision of schools and a local centre in the Desborough site is expected to lead to some internalisation of trips. It has been assumed that 80% of primary school trips and 50% of secondary school trips will be internal to the Desborough site.
- 2.3.9. It has been assumed that there will be no LGV trip generation associated with the Desborough site schools. The purpose split proportions have therefore been recalculated for these sites, and are shown in Table 2.14.

Table 2.14 User Class proportions for the Desborough site schools

Time period	Car commuting	Car business	Car other
AM peak	0.72	0.09	0.19
PM peak	0.73	0.08	0.19

- 2.3.10. The placemaking approach to the Local Plan has the potential to result in a shift towards sustainable modes of transport. In the absence of detailed information on mode shift, no allowance has been made for reduced demand to ensure the worst-case scenario has been assessed.
- 2.3.11. Scenario B also includes on-site infrastructure associated with the Local Plan development, for example on-site infrastructure at the Desborough site and new roundabouts at Harvest Hill Road/ Shoppenhangers Road and Braywick Road. The new links included in Scenario B for the Desborough site are highlighted red in Figure 2.3 below. The junction diagrams are shown in Appendix D.

² "SITE 5A GOLF COURSE ASSESSMENT APPROACH, FORECAST ASSUMPTIONS AND RESULTS", JANUARY 2016

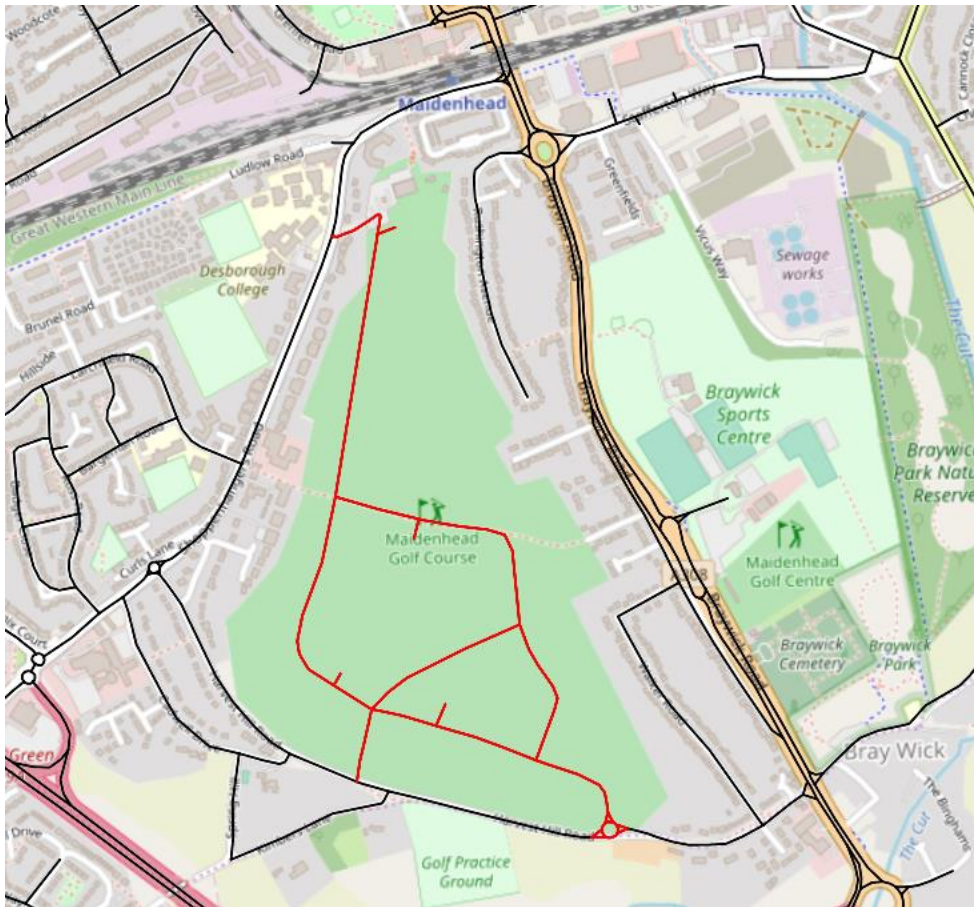


Figure 2.3 Desborough site infrastructure

- 2.3.12. Proposals for the Desborough site also include the Maidenhead Mile, a green link running through the site and into the Triangle site which incorporates bus and cycle priority measures. However, since the RBWM-HM2 is a highway only model, the Maidenhead Mile has not been included in Scenario B.
- 2.3.13. It should be noted that the layout for the Desborough site has yet to be agreed, and the proposals may therefore change.
- 2.3.14. The initial assessment of Scenario B showed that the introduction of the Local Plan sites, especially those in close proximity to the M4 J8/J9, for example the Triangle site and the Desborough site, caused a large increase in delay at the M4 J8/J9 in comparison with Scenario A (see Figure 2.4). This resulted in large volumes of traffic transferring away from the M4 onto alternative routes (see Figure 2.5). This abnormal reassignment of traffic will have an impact on traffic flows in the rest of the borough, and therefore will not be a true reflection of the impact of the Local Plan sites.
- 2.3.15. An M4 J8/J9 improvement scheme (see Figure 2.6) proposed as part of earlier Local Plan work was therefore included in Scenario B, in order to achieve a more realistic assignment of traffic, which does not result in traffic transferring away from the M4, and which will be a better reflection of the impact of the Local Plan sites.

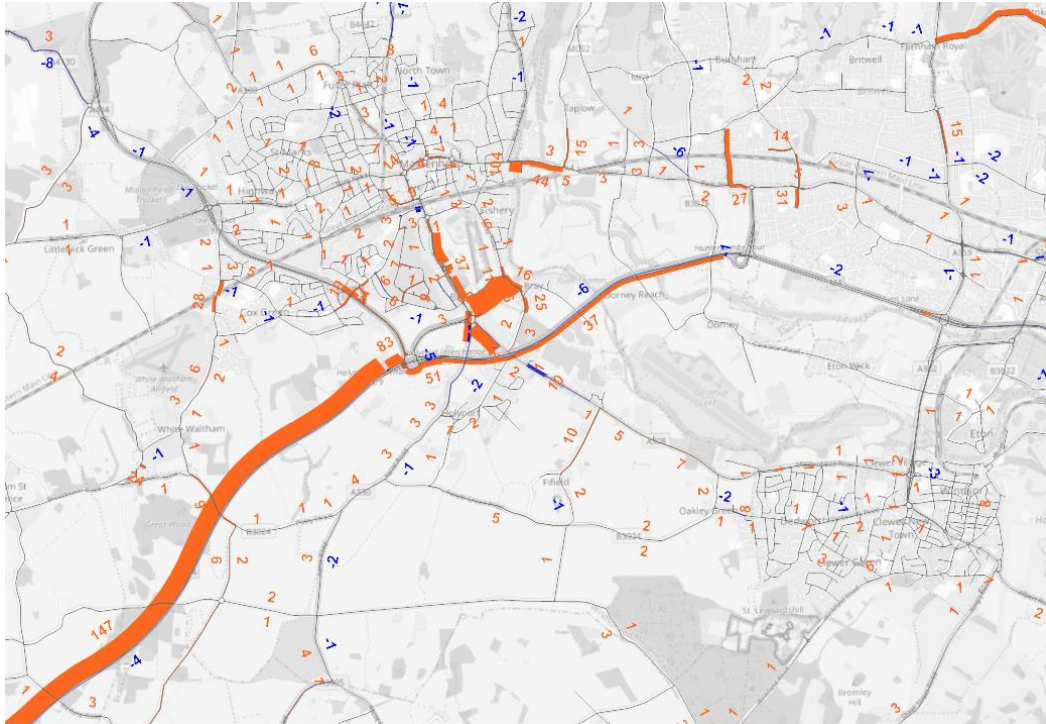


Figure 2.4 Initial delay difference per vehicle, ScB minus ScA (seconds), AM peak hour

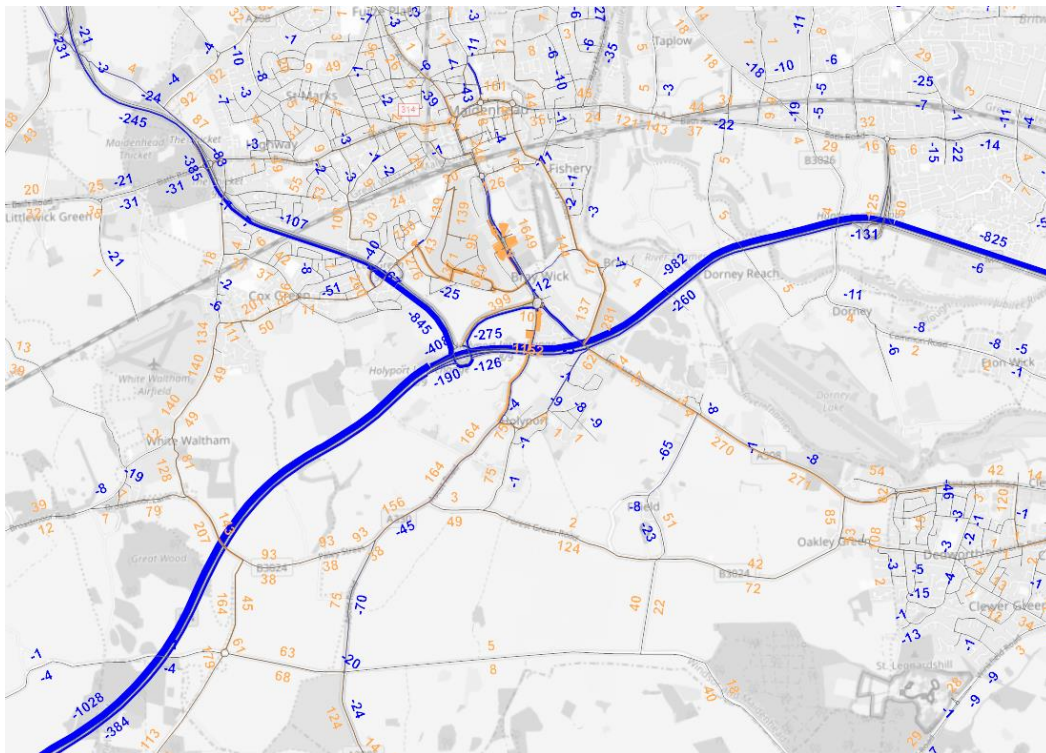


Figure 2.5 Initial flow difference ScB minus ScA (vehicles), AM peak hour

2.4 FORECAST TRIP GENERATION

2.4.1. The matrix totals for the 2016 base year, and 2033 Scenario A and Scenario B are shown in Table 2.15 below.

Table 2.15 Trip matrix totals, vehicles

	AM peak			PM peak		
	Car	LGV	HGV	Car	LGV	HGV
2016 Base	169,643	17,513	5,441	187,649	14,592	3,289
2033 Scenario A	207,385	22,100	5,747	225,566	18,431	3,481
Scenario A minus Base	37,742	4,587	307	37,917	3,839	191
2033 Scenario B	210,408	22,510	5,780	228,677	18,802	3,496
Scenario B minus Scenario A	3,023	410	32	3,111	371	15

2.5 MITIGATION SCENARIO C

- 2.5.1. Scenario C measures the impact of transport interventions that may be required to mitigate the Local Plan developments.
- 2.5.2. Upon completion of Scenario A and Scenario B, Project Centre analysed the model outputs (reported in Chapter 3) and produced a list of failing junctions. A junction was classed as failing if it had one or more arms with LOS E or F. At LOS D the junction is still deemed to be operating within its practical capacity and delays are relatively minor, which is generally considered to be an acceptable level of performance in a busy urban area. At LOS E and LOS F delays are more significant and in some cases the theoretical capacity of the junction is exceeded.
- 2.5.3. Where possible Project Centre produced outline designs to improve the performance of these junctions. The failing junctions and corresponding mitigation measures are detailed in Table 2.16.
-

Table 2.16 Failing junctions and proposed mitigation

Junction	Description	Mitigation
1	A308/ Holyport Road	Carriageway widening on Holyport Road to allow installation of additional lane on approach to junction
2	A308/ A330 Braywick Roundabout	Partial signalisation, widening of circulatory carriageway and free-flow slip lane between A330 and A308(M).
3	A4 Bridge Road/ Oldfield Road	Signalised junction as per Scenario A improvements, but longer flare lengths for eastern and southern arms, change in lane allocation for western and northern arms and additional lane on the A4 eastbound exit
4	A4 Bridge Road/ Ray Mead Road	Roundabout as per Scenario A improvements, but longer flare lengths for western, northern and eastern arms
5	Shoppenhangers Road/ Norreys Drive /A404(M) southbound slip	Replace two existing roundabouts with one larger roundabout
6	B470 High Street/ B376	New link road north of Datchet connecting Major's Farm Road and Slough Road. It should be noted that this link is dependent on securing land.
7	A308/ Oakley Green Road	New roundabout with dedicated turning lanes
8	A308/ Mill Lane	New signalised junction
9	B3022/ Keats Lane	Signalised junction as per Scenario A improvements, but optimise signal timings
10	B3022 St Leonards Road/ Clewer Hill Road	The only viable design requires roundabouts at Clewer Hill Road and Imperial Road, however these do not provide suitable pedestrian facilities. Therefore keep as a signalised junction, but optimise signal timings
11	A4/ A404(M) The Thicket Roundabout	New slip road from the A4 to A404(M) southbound
12	A332/ A329 Heatherwood roundabout	Widening on eastern, southern and western approaches and widening of circulatory carriageway

2.5.4. In addition to the junctions identified in Table 2.16, several other junctions were identified as 'failing'. These additional junctions are listed below, along with the reasons mitigation schemes have not been proposed:

- A308/ Broadway (no viable solution identified);
 - Windsor Road/ Winkfield Road (no funding currently available to improve this junction);
 - M4 J8/J9 (Highways England has consulted on improvements to this junction and will look at this as part of future Road Investment Strategies);
 - A308/ A404 (no funding currently available to improve this junction);
-

- A4/ Cookham Road (no viable solution identified);
- A308/ Castle Hill (no viable solution identified); and
- A308/ Stafferton Way (potential future widening of circulatory carriageway but scheme not available at the time modelling was undertaken).

2.5.5. The proposed improvements detailed in Table 2.16 have been coded into Scenario B (thus forming Scenario C) to assess whether the mitigation is able to accommodate the Local Plan growth.

2.5.6. Proposed outline designs for the junctions are included within Appendix E.

3 RESULTS - SCENARIO B VS SCENARIO A

3.1 MODEL OUTPUTS AND ANALYSIS

3.1.1. To determine the impact of the Local Plan sites on the highway network the following outputs have been produced for Scenario A and Scenario B:

- Actual flow
- Flow difference
- Delay
- Delay difference
- Level of Service (LOS)
- Journey times on selected routes, and
- Overall network statistics

3.2 FLOW

- 3.2.1. The link actual flows for Scenario A and Scenario B are shown in Appendix F and Appendix G.
- 3.2.2. Scenario A and Scenario B generally exhibit similar traffic flow patterns, with the heaviest traffic flows on the M4 and A404, which make up part of Highways England Strategic Road Network (SRN).
- 3.2.3. Traffic flows are also significant on other strategic roads in the borough, for example the A308, which runs through both Maidenhead and Windsor town centres, and the A322, which runs between Windsor and Ascot.
- 3.2.4. Traffic flows are generally lower on more local roads which are predominantly used in the early and final stages of journeys.

3.3 FLOW DIFFERENCE

- 3.3.1. The Scenario A and Scenario B link flows have been compared to understand the impact of the Local Plan sites on the highway network. The link flow differences for the 2033 AM and PM peak hours are shown in Appendix F and Appendix G. Increases in flow are shown in orange whereas decreases in flow are shown in blue. All flows are displayed in vehicles.
- 3.3.2. There is a general increase in traffic flow in the borough in Scenario B compared to Scenario A as the Local Plan sites introduce additional trips onto the network.
- 3.3.3. The capacity improvements at M4 J8/J9 attract additional traffic southbound along the A404(M) in both the AM and PM peak hours (approximately 640 and 730 vehicles respectively).
- 3.3.4. The additional traffic generated by the Desborough site results in an increase in flow along Harvest Hill Road as it is a primary access for the site. The increased traffic flow around the Desborough site causes existing traffic to transfer away from the neighbouring Braywick Road and use alternative routes, for example Bray Road.
- 3.3.5. There are also increases in traffic flow along some roads leading into and out Maidenhead town centre, for example the A4 Bath Road.
-

- 3.3.6. In Windsor the additional Local Plan traffic results in an increase in flow along the A332 Royal Windsor Way as traffic travels between Windsor and the M4 (approximately 200 two-way trips in the AM peak hour and 320 two-way trips in the PM peak hour). There are also more minor flow increases along the A308 Maidenhead Road, B3024 Dedworth Road and B3026 Eton Wick Road.
- 3.3.7. Despite several Local Plan sites being located in Ascot town centre the flow difference is relatively minor in both the AM and PM peak hours with changes generally not exceeding 100 vehicles.

3.4 DELAY AND LEVEL OF SERVICE (LOS)

- 3.4.1. Since LOS is related to the mean delay experienced per vehicle, delay and LOS outputs have been analysed in parallel.
- 3.4.2. The delays for Scenario A and Scenario B are shown in Appendix F and Appendix G. The delays include the link delay and the delay at the downstream junction. The delays in Scenario A and Scenario B have been compared to understand the impact of the Local Plan sites on the performance of the highway network. The delay differences are also shown in Appendix F and Appendix G. Increases in delay are shown in orange whereas decreases in delay are shown in blue. The delays are displayed in seconds.
- 3.4.3. LOS is used to describe how well a turn is performing, and is related to the mean delay experienced per vehicle, as set out in Table 3.1.

Table 3.1 Junction Level of Service Interpretation

LOS	Mean delay/ vehicle	
	Un-signalised junction	Signalised junction
A	0 – 10 sec	0 – 10 sec
B	10 – 15 sec	10 – 20 sec
C	15 – 25 sec	20 – 35 sec
D	25 – 35 sec	35 – 55 sec
E	35 – 50 sec	55 – 80 sec
F	50 + sec	80 + sec

- 3.4.4. Table 3.1 shows that the LOS thresholds differ for un-signalised and signalised junctions. One reason for this is that delay at a signalised junction is more ‘acceptable’ because drivers expect to be delayed at traffic lights.
- 3.4.5. If the volume exceeds the capacity for a particular junction, LOS F will be allocated to that turn regardless of the delay.
- 3.4.6. The turn LOS for each junction within the borough was analysed to assess the impact of the Local Plan sites. The junctions with one or more turns experiencing LOS D, E or F in Scenario A and Scenario B are graphically displayed in Appendix F and Appendix G. The junction approach from which the turn originates is also identified.

- 3.4.7. Delays generally increase in Scenario B compared to Scenario A due to the additional Local Plan traffic.
- 3.4.8. In Scenario A and Scenario B several key junctions around Maidenhead experience LOS D or above including the M4 J8/9, Braywick Roundabout and the A4 Bridge Road/ Oldfield Road signalised junction.
- 3.4.9. In Scenario A the M4 J8/J9 experiences congestion in both the AM and PM peak hours.
- 3.4.10. In the AM peak hour of Scenario A the demand exceeds capacity on multiple approaches, resulting in LOS F. Although capacity improvements are introduced in Scenario B, multiple approaches continue to operate with LOS D or above.
- 3.4.11. In the PM peak hour the A404(M) approach to the M4 J8/J9 roundabout experiences LOS D in Scenario A and LOS F in Scenario B. The capacity improvements included in Scenario B reduce the mean delay experienced per vehicle by approximately 111s, which attracts approximately 730 additional vehicles onto the approach. This significant increase in demand exceeds the improved junction capacity, and triggers LOS F.
- 3.4.12. In the AM and PM peak hours for both Scenario A and Scenario B Braywick Roundabout experiences LOS F on multiple approaches as the demand exceeds the capacity.
- 3.4.13. In Scenario B delays along the A4 Bath Road increase, particularly on the approach to The Thicket Roundabout, which experiences up to 33s additional delay in the PM peak hour.
- 3.4.14. The A4 Bridge Road/ Oldfield Road signalised junction experiences LOS D or above in the AM and PM peak hours of both Scenario A and Scenario B.
- 3.4.15. In Scenario B in the AM and PM peak hours there is increase in delay on the approaches to the Shoppenhangers Road/ Norreys Drive /A404(M) southbound slip double roundabout junction, resulting in LOS D or above on multiple approaches.
- 3.4.16. There are congestion issues at several junctions in Windsor and Datchet in both scenarios and time periods. These include the B3022 St Leonards Road/ Clewer Hill Road signalised junction (LOS E in the AM peak hour and LOS F in the PM peak hour of both scenarios), the B3022/ Keats Lane signalised junction (LOS D in the AM peak hour and LOS F in the PM peak hour of both scenarios) and the B470 High Street/ B376 junction (LOS D in the AM peak hour of Scenario A, LOS E in the PM peak hour of Scenario A and the AM peak hour of Scenario B, and LOS F in the PM peak hour of Scenario B).
- 3.4.17. In Ascot the delay differences between Scenario A and Scenario B in Ascot are relatively minor. The most significant increase in delay is experienced on the eastern approach to the A332/ A329 Heatherwood roundabout in the PM peak hour (44s increase in delay), when the turn operates with LOS F.

3.5 JOURNEY TIMES

- 3.5.1. Travel times provide a representation of network performance that is easier for a wide audience of readers to understand. A series of nine routes, which are shown in Figure 3.1, were identified to assess journey times across the network.
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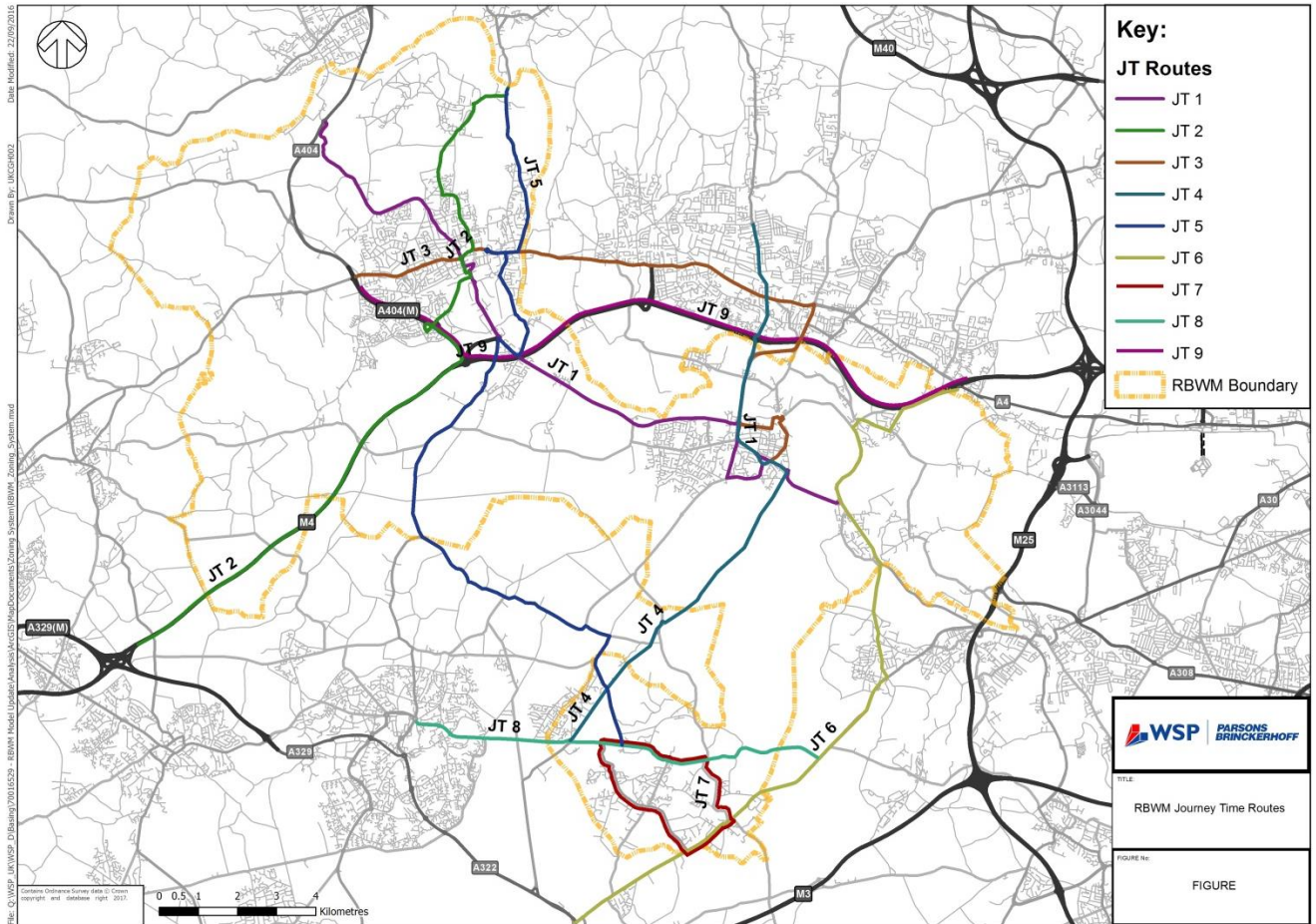


Figure 3.1 Journey Time Routes within the Detailed Area of Modelling

- 3.5.2. The results of the journey time routes in each of the scenarios, as well as comparisons between the different scenarios, are shown in Table 3.2 and Table 3.3. The tables demonstrate the absolute difference (in seconds) and percentage difference between Scenario A vs the Base and Scenario B vs Scenario A.
- 3.5.3. Graphs comparing the journey times for each scenario can be found in Appendix H. The journey time routes are plotted by distance to identify where delays occur and highlight junctions that potentially require mitigation. A detailed list of all the timing point used for the assessment is also presented in Appendix H.

Table 3.2 AM journey time summary, Scenario B vs Scenario A

Route		Base year Modelled (s)	Scenario A 2033 Modelled (s)	Scenario B 2033 Modelled (s)	Scenario A vs Base		Scenario B vs Scenario A	
ID	Name				Absolute	Percentage	Absolute	Percentage
1	JT 1- EB	2,015	2,203	2,378	188	9%	176	8%
2	JT 1 - WB	1,934	2,037	2,294	103	5%	257	13%
3	JT 2- NB	1,578	1,729	2,094	151	10%	365	21%
4	JT 2 - SB	1,794	1,928	2,144	134	7%	216	11%
5	JT 3 - EB	2,395	2,318	2,364	-77	-3%	46	2%
6	JT 3 - WB	2,082	2,223	2,425	141	7%	203	9%
7	JT 4 - NB	1,520	1,575	1,553	55	4%	-22	-1%
8	JT 4 - SB	1,486	1,662	1,695	176	12%	33	2%
9	JT 5 - WB	2,006	2,173	2,306	167	8%	133	6%
10	JT 5 - EB	1,994	2,143	2,355	149	7%	211	10%
11	JT 6 - NB	2,316	2,513	2,533	197	8%	21	1%
12	JT 6 - SB	1,679	1,774	1,792	95	6%	18	1%
13	JT 7 - CW	882	914	921	32	4%	7	1%
14	JT 7 - ACW	908	954	958	46	5%	4	0%
15	JT 8 - EB	1,149	1,396	1,474	247	22%	77	6%
16	JT 8 - WB	872	898	911	26	3%	12	1%
17	JT 9 - EB	868	929	898	61	7%	-31	-3%
18	JT 9 - WB	707	746	896	39	6%	150	20%

Table 3.3 PM journey time summary, Scenario B vs Scenario A

Route		Base year Modelled (s)	Scenario A 2033 Modelled (s)	Scenario B 2033 Modelled (s)	Scenario A vs Base		Scenario B vs Scenario A	
ID	Name				Absolute	Percentage	Absolute	Percentage
1	JT 1- EB	2,022	2,122	2,235	100	5%	112	5%
2	JT 1 - WB	1,965	2,082	2,320	117	6%	238	11%
3	JT 2- NB	1,557	1,575	1,660	18	1%	85	5%
4	JT 2 - SB	1,757	1,908	2,073	151	9%	165	9%
5	JT 3 - EB	2,215	2,202	2,276	-13	-1%	74	3%
6	JT 3 - WB	2,116	2,258	2,451	142	7%	192	9%
7	JT 4 - NB	1,439	1,597	1,511	158	11%	-86	-5%
8	JT 4 - SB	1,643	1,900	1,899	257	16%	-1	0%
9	JT 5 - WB	1,946	2,097	2,587	151	8%	490	23%
10	JT 5 - EB	1,954	2,160	2,373	206	11%	212	10%
11	JT 6 - NB	1,984	2,270	2,258	286	14%	-11	-1%
12	JT 6 - SB	1,795	1,868	1,903	73	4%	35	2%
13	JT 7 - CW	868	871	882	3	0%	11	1%
14	JT 7 - ACW	879	902	904	23	3%	2	0%
15	JT 8 - EB	891	1,457	1,341	566	64%	-117	-8%
16	JT 8 - WB	921	951	1,000	30	3%	49	5%
17	JT 9 - EB	783	816	739	33	4%	-78	-10%
18	JT 9 - WB	782	821	901	39	5%	80	10%

3.5.4. Traffic levels increase in Scenario A compared to the Base, resulting in increased journey times in the borough. The introduction of the Local Plan sites in Scenario B further increases journey times, especially on routes travelling through Maidenhead town centre. This can be explained by the proximity of many Local Plan sites to Maidenhead Town Centre, which introduce additional traffic onto the network and increase congestion at a number of key junctions.

3.6 NETWORK STATISTICS

- 3.6.1. The overall network statistics for Scenario A and Scenario B have been compared to further understand the impact of the Local Plan development on the performance of the highway network.
- 3.6.2. The network statistics for each of the scenarios, as well as comparisons between the different scenarios, are shown in Table 3.4 and Table 3.5. The tables demonstrate the absolute difference and percentage difference between Scenario A vs the Base and Scenario B vs Scenario A.

Table 3.4 AM network statistics, Scenario B vs Scenario A

Statistic	Unit	Base	Scenario A	Scenario B	Scenario A vs Base		Scenario B vs Scenario A	
					Absolute	Percentage	Absolute	Percentage
Over-capacity Queues	Veh-Hrs	778.4	1,871.7	2,217.2	1,093.3	140%	345.5	18%
Link Cruise Time	Veh-Hrs	45,639.6	55,737.6	56,225.0	10,098.0	22%	487.4	1%
Total Travel Time	Veh-Hrs	61,917.1	84,318.1	85,402.5	22,401.0	36%	1,084.3	1%
Total Link Delay	Veh-Hrs	16,277.5	28,580.5	29,177.4	12,303.0	76%	596.9	2%
Total Network Delay	Veh-Hrs	17,301.9	29,397.5	30,181.9	12,095.6	70%	784.4	3%
Total Travel Distance	Veh-kms	3,706,600.2	4,542,299.6	4,575,279.4	835,699.4	23%	32,979.8	1%
Average Speed	kmph	59.9	53.9	53.6	-6.0	-10%	-0.3	-1%

Table 3.5 PM network statistics, Scenario B vs Scenario A

Statistic	Unit	Base	Scenario A	Scenario B	Scenario A vs Base		Scenario B vs Scenario A	
					Absolute	Percentage	Absolute	Percentage
Over-capacity Queues	Veh-Hrs	837.4	1,752.6	1,979.1	915.2	109%	226.5	13%
Link Cruise Time	Veh-Hrs	49,030.7	58,957.3	59,357.5	9,926.6	20%	400.2	1%
Total Travel Time	Veh-Hrs	69,914.4	94,745.3	95,538.1	24,830.9	36%	792.8	1%
Total Link Delay	Veh-Hrs	20,883.7	35,788.0	36,180.7	14,904.3	71%	392.6	1%
Total Network Delay	Veh-Hrs	21,458.0	35,495.0	36,123.6	14,037.0	65%	628.6	2%
Total Travel Distance	Veh-kms	4,023,046.6	4,859,255.5	4,885,533.7	836,208.9	21%	26,278.2	1%
Average Speed	kmph	57.5	51.3	51.1	-6.3	-11%	-0.2	0%

- 3.6.13. The increased traffic levels in Scenario A compared to the Base result in increased congestion, with more over-capacity queues and delays and lower average speeds. The increased number of trips being made in Scenario A results in an increase in total travel time and total travel distance across the network.
- 3.6.14. The introduction of the Local Plan sites in Scenario B further increases queues and delays across the network, although due to the scale of the change the differences are much less significant.

4 RESULTS - SCENARIO C VS SCENARIO B

4.1 MODEL OUTPUTS AND ANALYSIS

4.1.1. To determine the impact of the proposed mitigation schemes Scenario B and Scenario C have been compared. The analysis has considered:

- Actual flow
- Flow difference
- Delay
- Delay difference
- Level of Service (LOS)
- Journey times on selected routes, and
- Overall network statistics

4.2 FLOW

4.2.1. The link actual flows for Scenario C are shown in Appendix F and Appendix G.

4.2.2. Scenario C generally exhibits similar traffic flow patterns to Scenario A and Scenario B, with the largest traffic flows on the strategic routes in the borough, for example the M4 and the A308, and lower traffic flows on the local roads.

4.3 FLOW DIFFERENCE

4.3.1. The Scenario B and Scenario C link flows have been compared to understand the impact of the proposed mitigation schemes on the highway network. The link flow differences for the 2033 AM and PM peak hours are shown in Appendix F and Appendix G. Increases in flow are shown in orange whereas decreases in flow are shown in blue. All flows are displayed in vehicles.

4.3.2. The main flow differences between Scenario B and Scenario C are centred around the mitigation schemes. For example, in Maidenhead the improvements at Braywick Roundabout attract traffic along the A308 Braywick Road and the A308 Windsor Road, in Windsor the A308/ Mill Lane junction improvements attract traffic onto the A308 Maidenhead Road instead of the B3024 Dedworth Road, and in Datchet the new link road between Major's Farm Road and Slough Road reduces traffic flow through Datchet village.

4.4 DELAY AND LEVEL OF SERVICE (LOS)

4.4.1. The delays for Scenario C are shown in Appendix F and Appendix G. The delays include the link delay and the delay at the downstream junction. The delays in Scenario B and Scenario C have been compared to understand the impact of the proposed mitigation schemes on the performance of the highway network. The delay differences are also shown in Appendix F and Appendix G. Increases in delay are shown in orange whereas decreases in delay are shown in blue. The delays are displayed in seconds.

4.4.2. The junctions with one or more turns experiencing LOS D, E or F in Scenario C are graphically displayed in Appendix F and Appendix G. The junction approach from which the turn originates is also identified.

4.4.3. The delay differences between Scenario B and Scenario C are most noticeable around the junctions where mitigation measures have been introduced. The performance of each of these junctions in Scenario B and Scenario C has been compared in more detail below.

A308/ HOLYPORT ROAD

4.4.4. The AM and PM LOS at the A308/ Holyport Road junction for Scenario B and Scenario C is compared in Figure 4.1 to Figure 4.4.

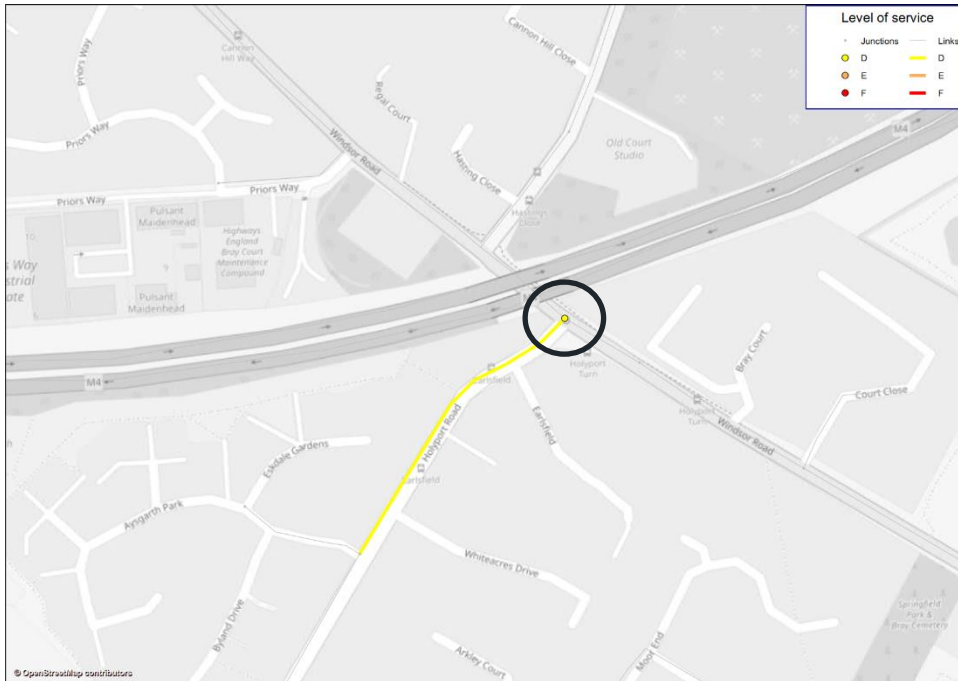


Figure 4.1 Holyport Road, Scenario B AM LOS



Figure 4.2 Holyport Road, Scenario B PM LOS

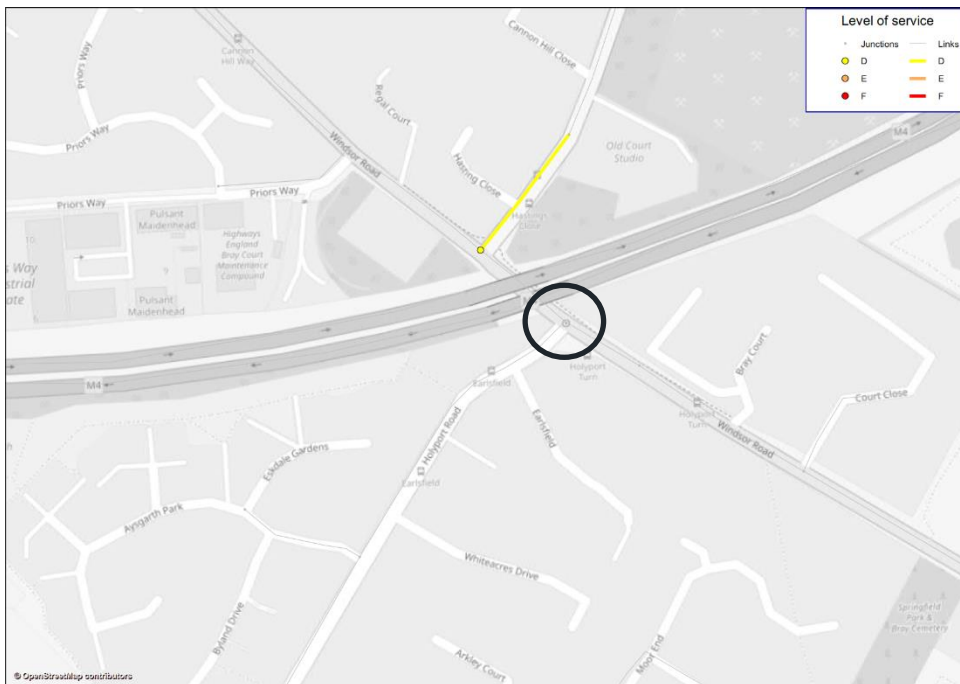


Figure 4.3 Holyport Road, Scenario C AM LOS

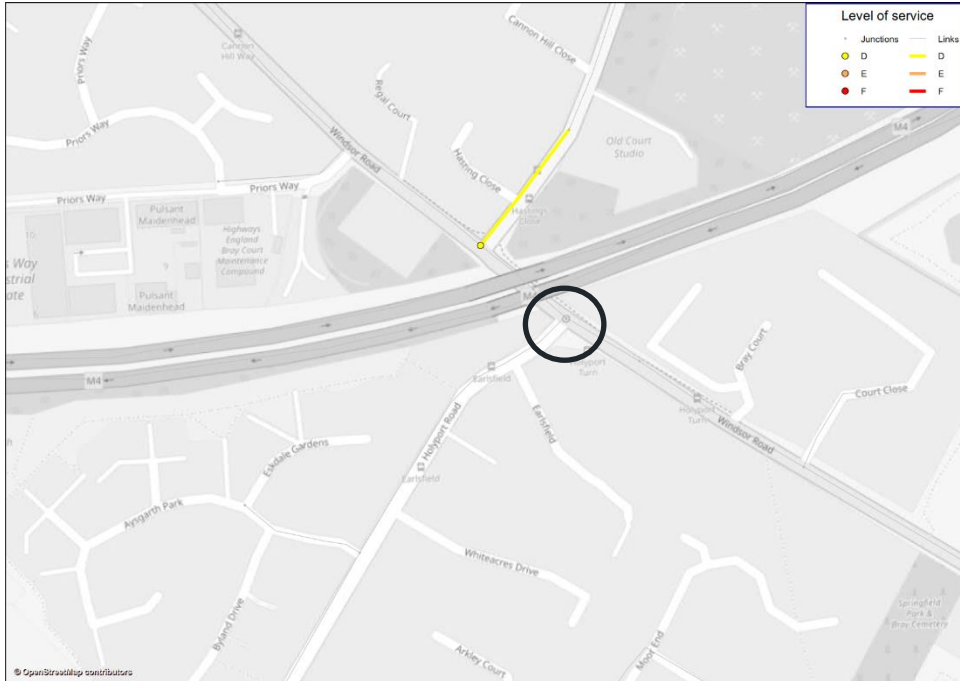


Figure 4.4 Holyport Road, Scenario C PM LOS

- 4.4.5. The proposed mitigation at the A308/ Holyport Road junction improves the performance of the junction, reducing the LOS from LOS D in the AM peak hour and LOS F in the PM peak hour of Scenario B to LOS below D in the AM and PM peak hours of Scenario C.

A308/ A330 BRAYWICK ROUNDABOUT

- 4.4.6. The AM and PM LOS at Braywick Roundabout for Scenario B and Scenario C is compared in Figure 4.5 to Figure 4.8.

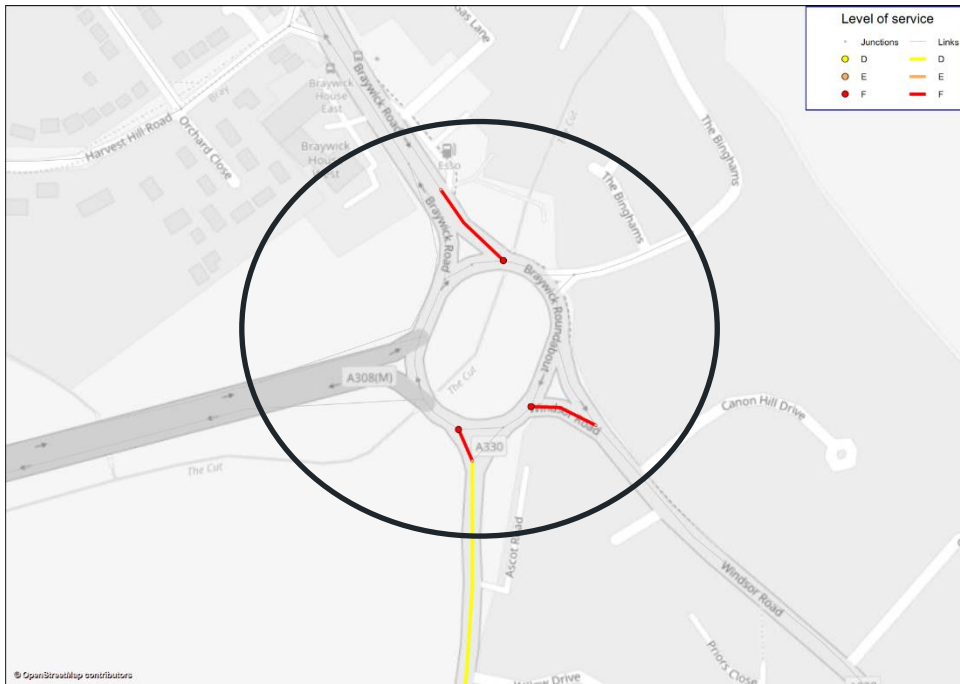


Figure 4.5 Braywick Roundabout, Scenario B AM LOS

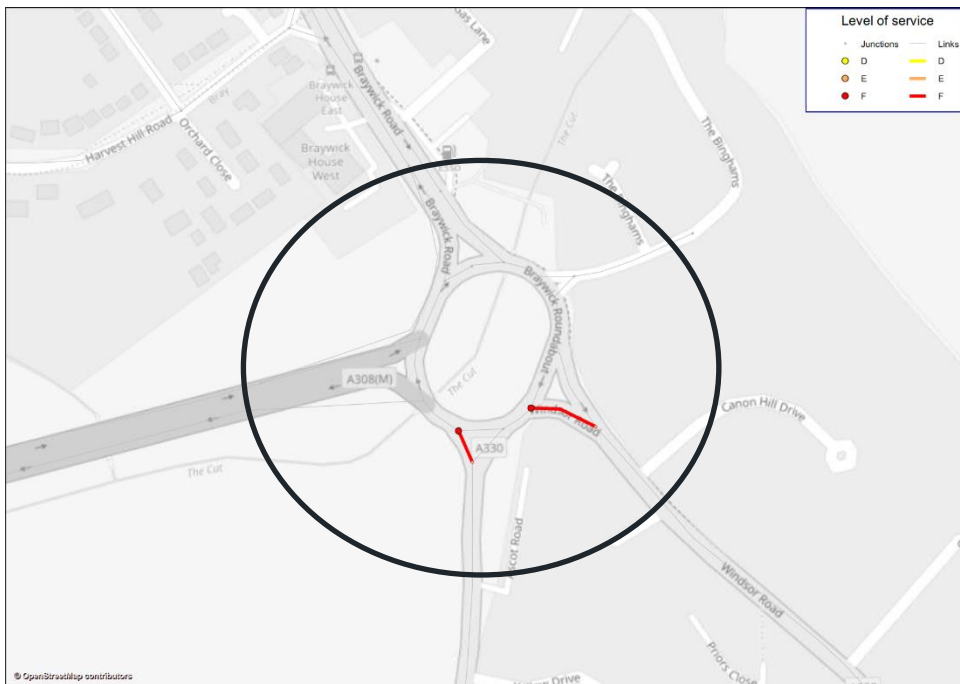


Figure 4.6 Braywick Roundabout, Scenario B PM LOS

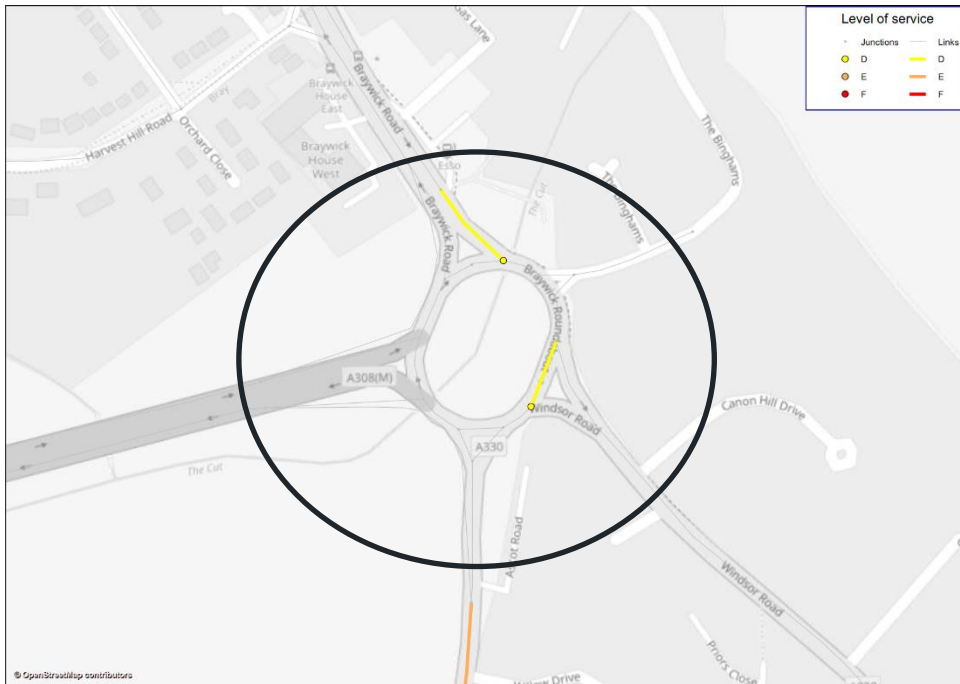


Figure 4.7 Braywick Roundabout, Scenario C AM LOS

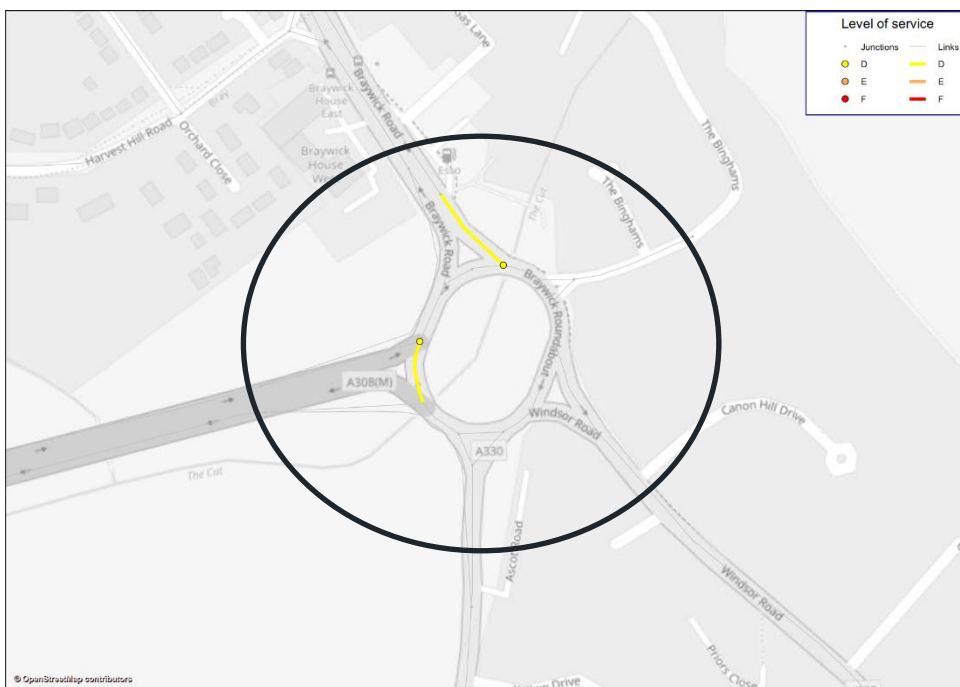


Figure 4.8 Braywick Roundabout, Scenario C PM LOS

4.4.7. Although the introduction of traffic signals at Braywick Roundabout in Scenario C increases the turn delay and LOS for the circulatory flow, the improvements generally reduce delays on the approaches to the junction, particularly on the A308 Braywick Road, the A308 Windsor Road and the A330 Ascot Road.

A4 BRIDGE ROAD/ OLDFIELD ROAD

4.4.8. The AM and PM LOS at the A4 Bridge Road/ Oldfield Road junction for Scenario B and Scenario C is compared in Figure 4.9 to Figure 4.12.

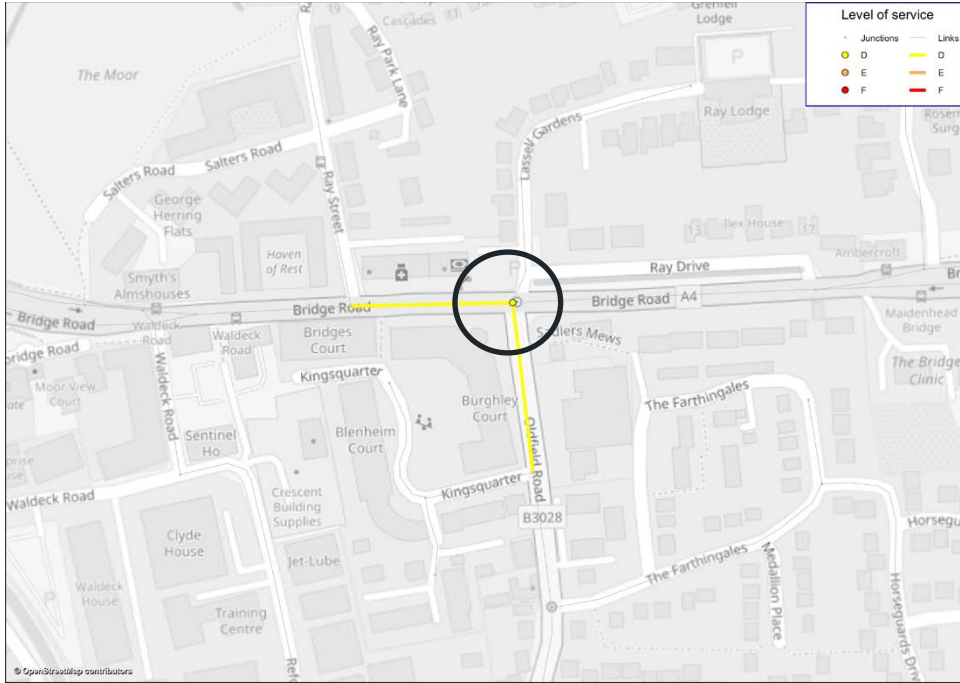


Figure 4.9 Oldfield Road, Scenario B AM LOS

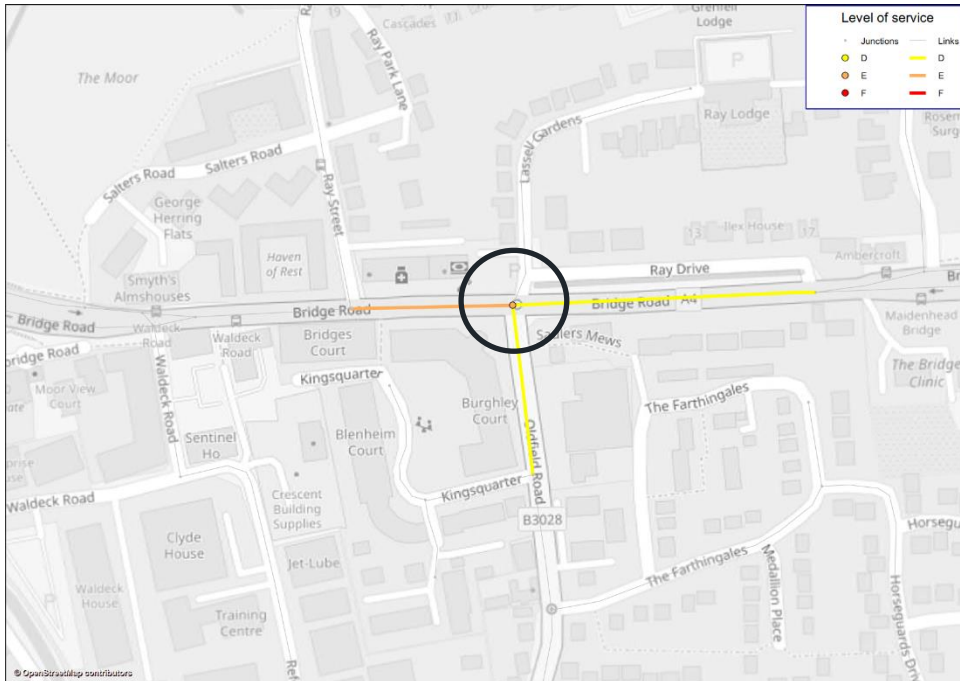


Figure 4.10 Oldfield Road, Scenario B PM LOS

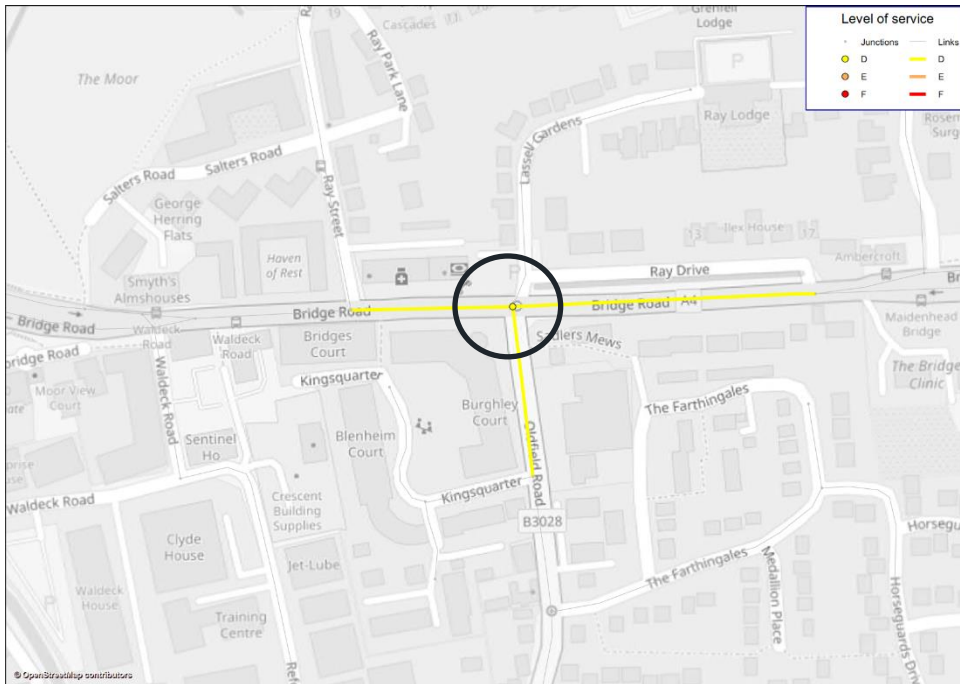


Figure 4.11 Oldfield Road, Scenario C AM LOS

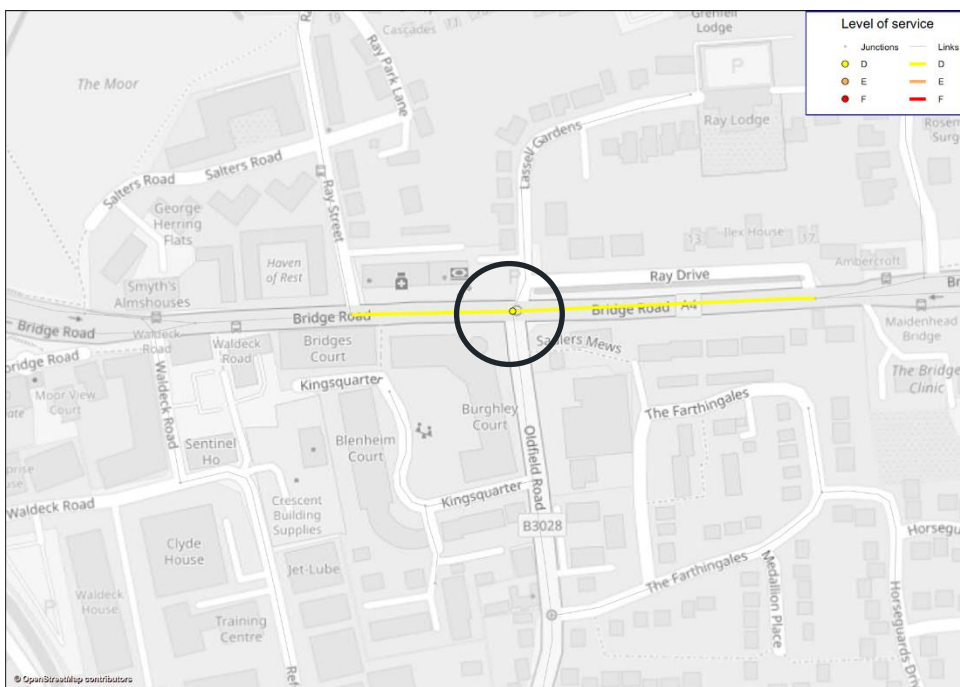


Figure 4.12 Oldfield Road, Scenario C PM LOS

4.4.9. The LOS results for Scenario C suggest that the mitigation proposed at the A4 Bridge Road/ Oldfield Road junction does not improve the performance of the junction. However, it should be noted that VISUM is a strategic modelling software and as such is not overly sensitive to details such as flare lane length. It is therefore recommended that localised junction modelling is undertaken at the A4 Bridge Road/ Oldfield Road junction to assess the impact of the proposed mitigation at this location.

A4 BRIDGE ROAD/ RAY MEAD ROAD

4.4.10. The AM and PM LOS at the A4 Bridge Road/ Ray Mead Road junction for Scenario B and Scenario C is compared in Figure 4.13 to Figure 4.16.

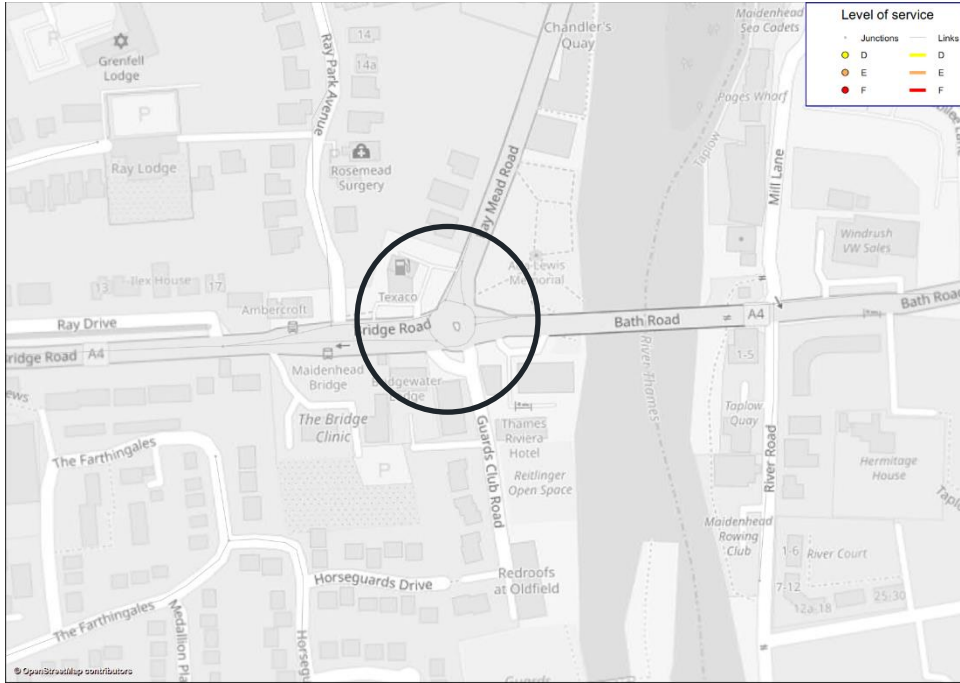


Figure 4.13 Ray Mead Road, Scenario B AM LOS

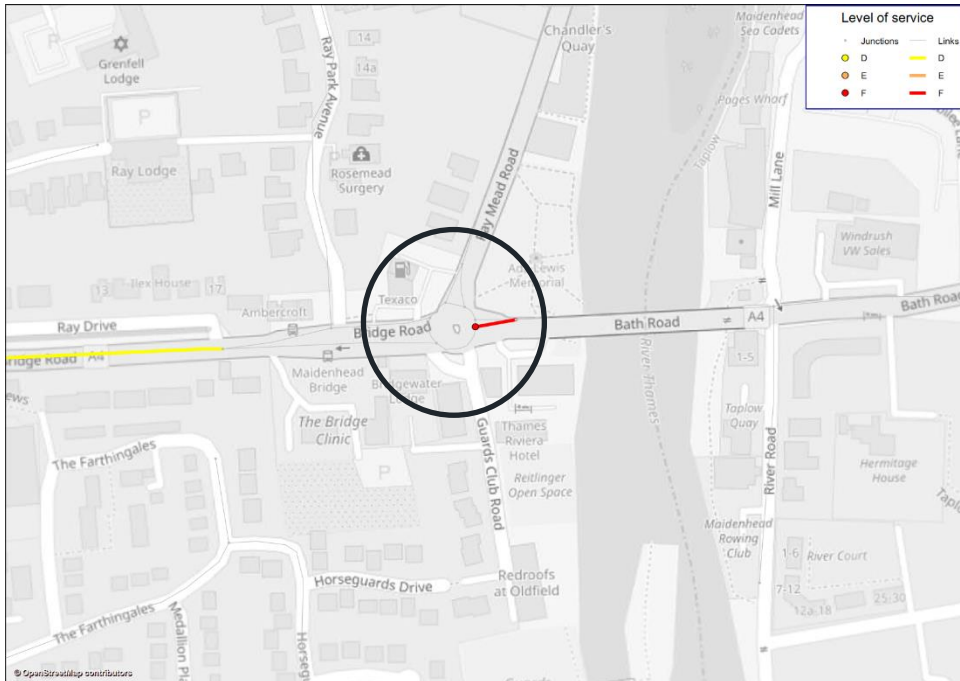


Figure 4.14 Ray Mead Road, Scenario B PM LOS

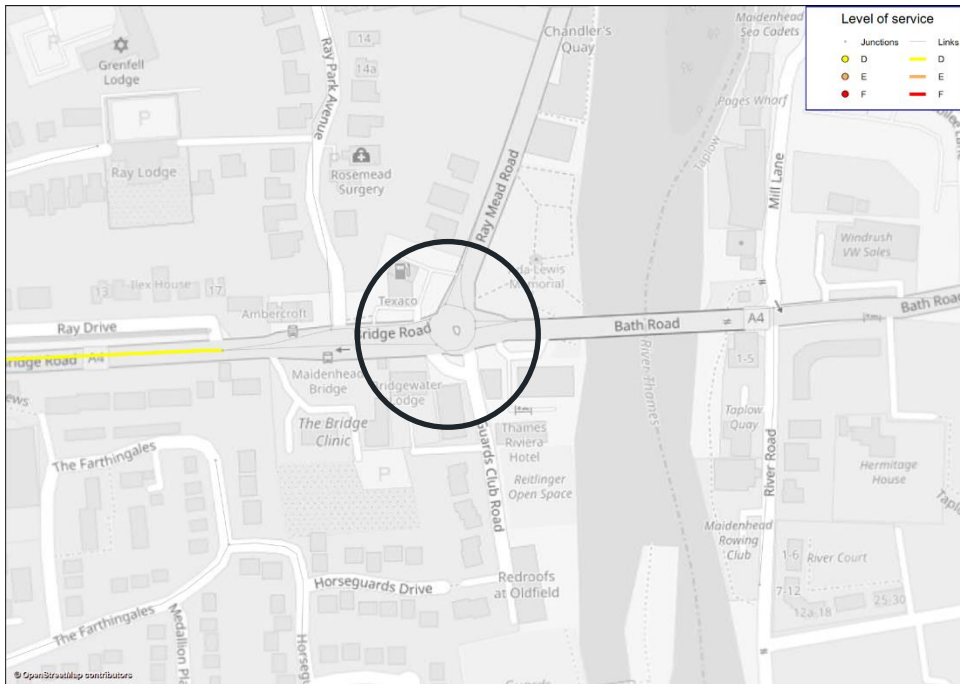


Figure 4.15 Ray Mead Road, Scenario C AM LOS

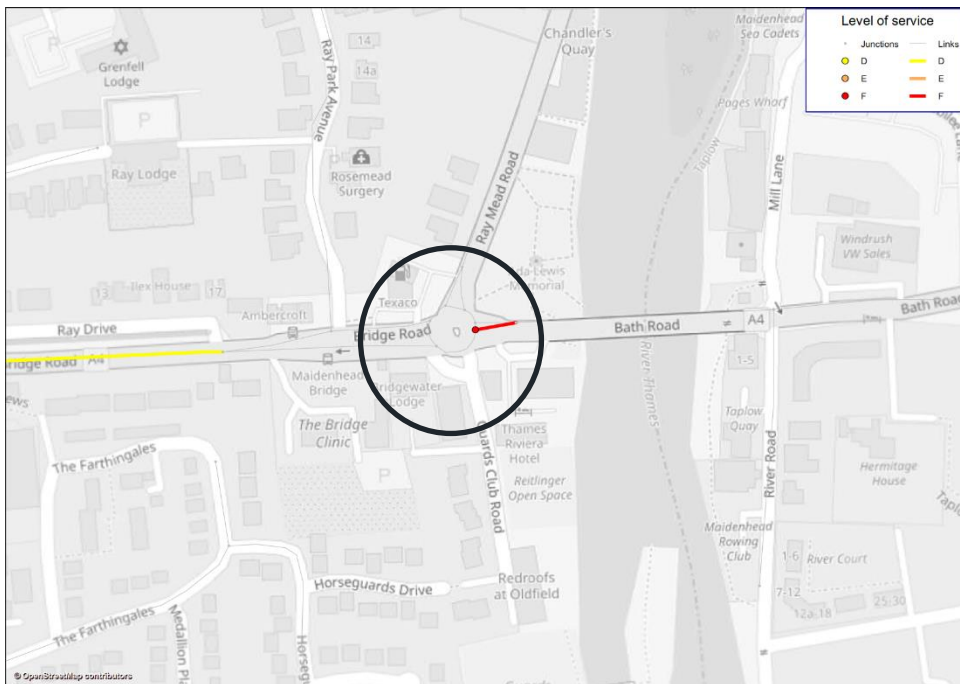


Figure 4.16 Ray Mead Road, Scenario C PM LOS

4.4.11. The LOS results for Scenario C suggest that the mitigation proposed at the A4 Bridge Road/ Ray Mead Road junction does not improve junction performance. However, it should be noted that VISUM is a strategic modelling software and as such is not overly sensitive to details such as flare lane length. It is therefore recommended that localised junction modelling is undertaken at the A4 Bridge Road/ Ray Mead Road junction to assess the impact of the proposed mitigation at this location.

SHOPPENHANGERS ROAD/ NORREYS DRIVE /A404(M) SOUTHBOUND SLIP

4.4.12. The AM and PM LOS at the Shoppenhangers Road/ Norreys Drive junction for Scenario B and Scenario C is compared in Figure 4.17 to Figure 4.20.

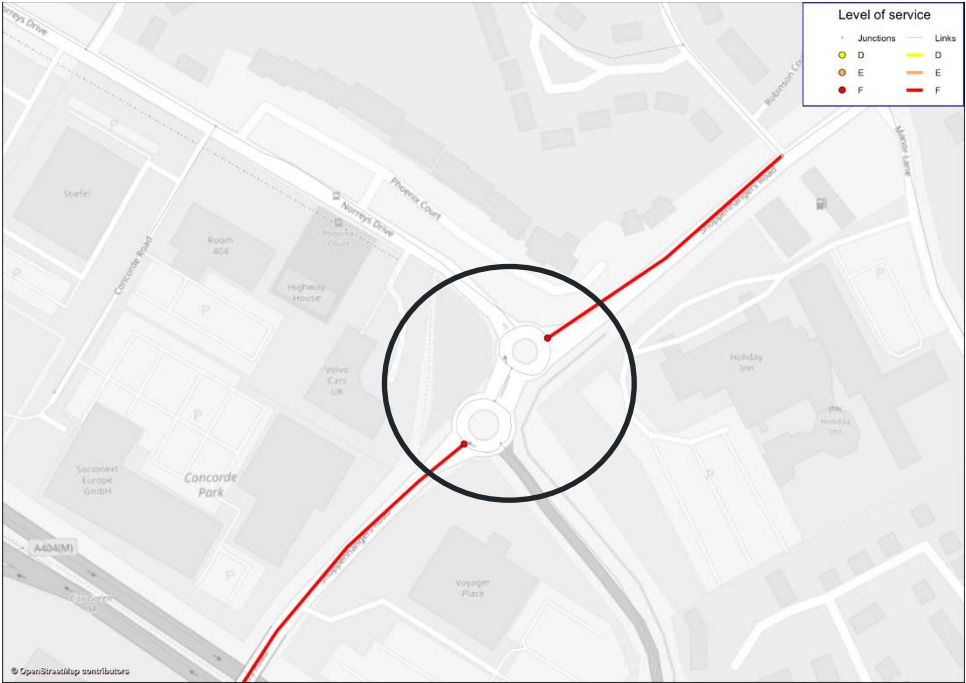


Figure 4.17 Norreys Drive, Scenario B AM LOS

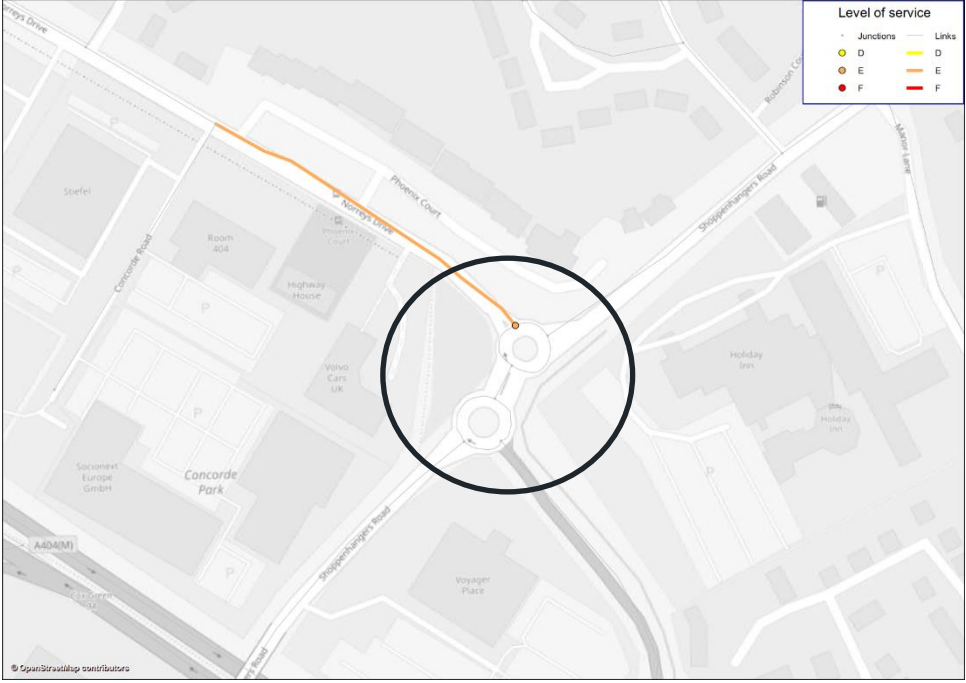


Figure 4.18 Norreys Drive, Scenario B PM LOS

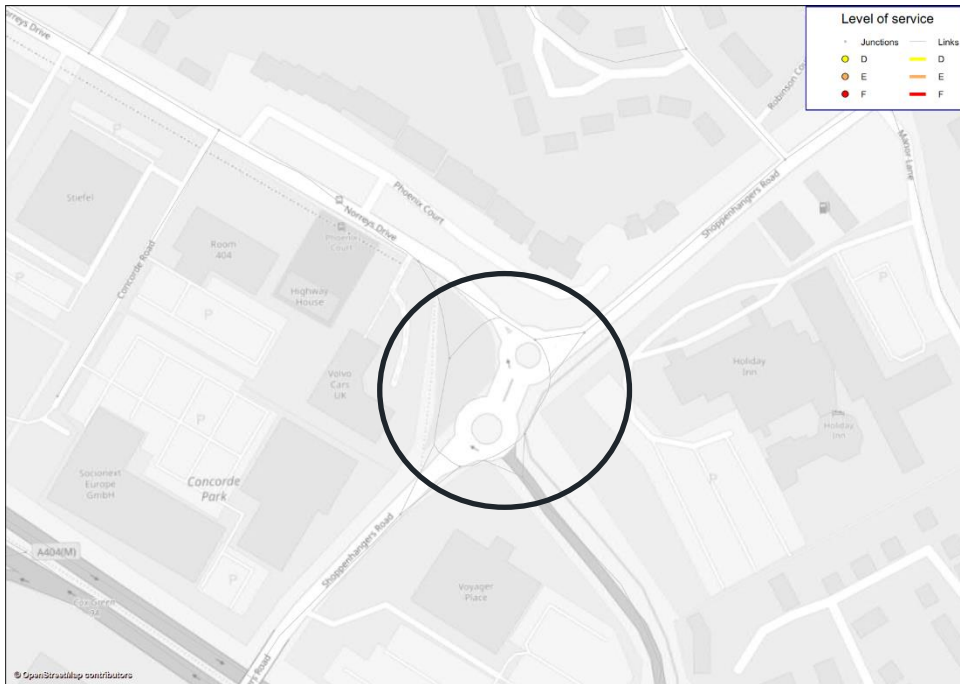


Figure 4.19 Norreys Drive, Scenario C AM LOS

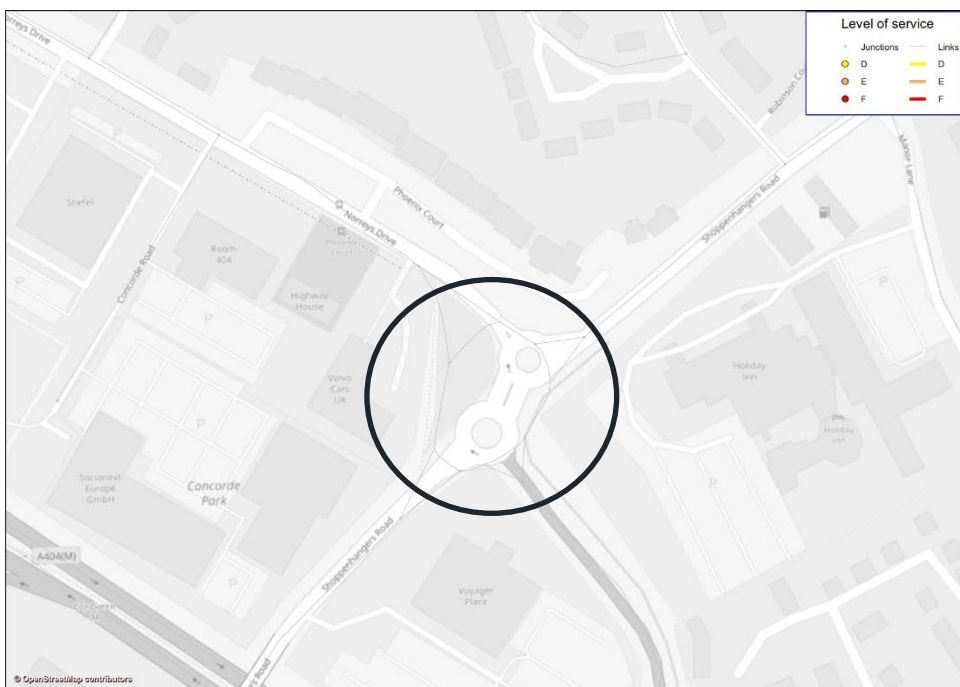


Figure 4.20 Norreys Drive, Scenario C PM LOS

4.4.13. The mitigation proposed at this junction reduces delays in both the AM and PM peak hours, with all turns operating below LOS D.

B470 HIGH STREET/ B376

4.4.14. The AM and PM LOS at the B470 High Street/ B376 junction for Scenario B and Scenario C is compared in Figure 4.21 to Figure 4.24.



Figure 4.21 B470 High Street, Scenario B AM LOS



Figure 4.22 B470 High Street, Scenario B PM LOS



Figure 4.23 B470 High Street, Scenario C AM LOS



Figure 4.24 B470 High Street, Scenario C PM LOS

- 4.4.15. The introduction of the new link road between Major's Farm Road and Slough Road in Scenario C reduces traffic flow through Datchet village, and improves the performance of the B470 High Street/ B376 junction to LOS below D.

A308/ OAKLEY GREEN ROAD

4.4.16. The AM and PM LOS at the A308/ Oakley Green Road junction for Scenario B and Scenario C is compared in Figure 4.25 to Figure 4.28.



Figure 4.25 Oakley Green Road, Scenario B AM LOS

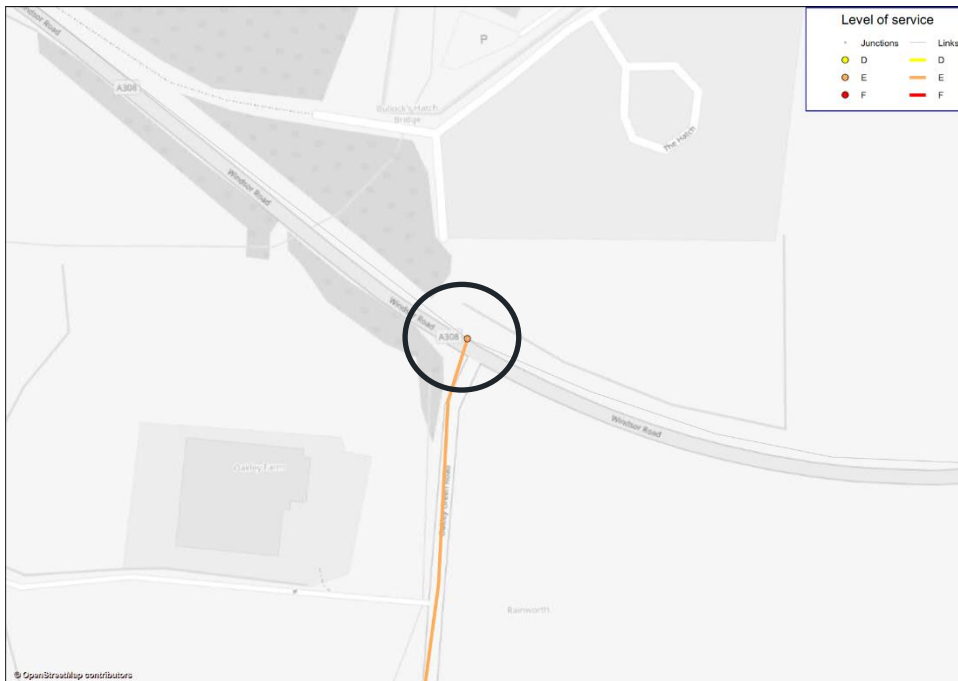


Figure 4.26 Oakley Green Road, Scenario B PM LOS



Figure 4.27 Oakley Green Road, Scenario C AM LOS



Figure 4.28 Oakley Green Road, Scenario C PM LOS

4.4.17. The proposed mitigation at the A308/ Oakley Green Road junction reduces delays on the approaches to the junction and improves the junction performance to LOS below D in both the AM and PM peak hours.

A308/ MILL LANE

4.4.18. The AM and PM LOS at the A308/ Mill Lane junction for Scenario B and Scenario C is compared in Figure 4.29 to Figure 4.32.

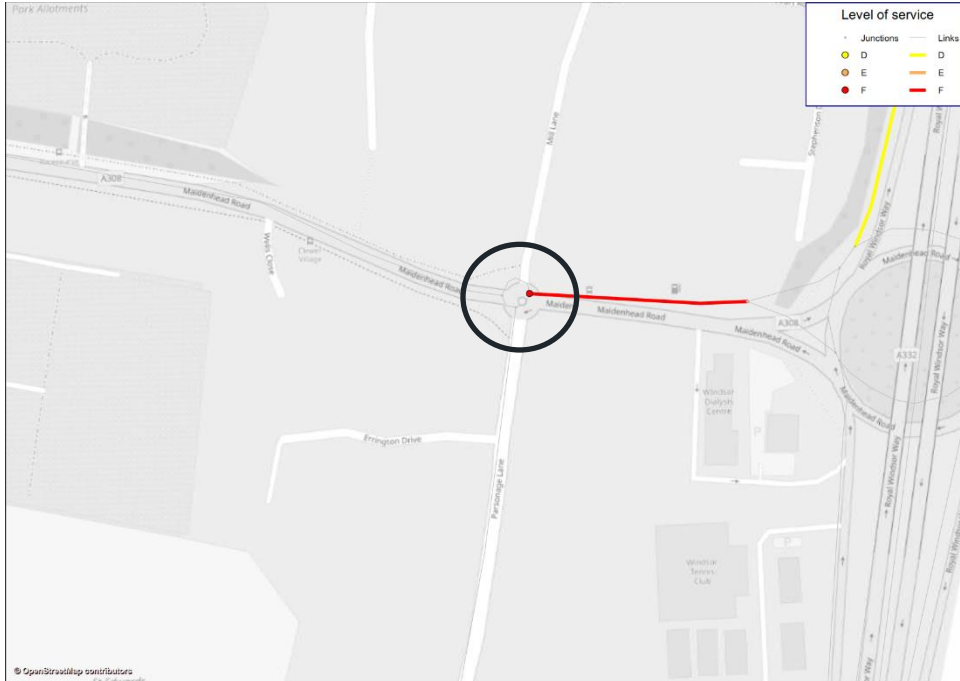


Figure 4.29 Mill Lane, Scenario B AM LOS

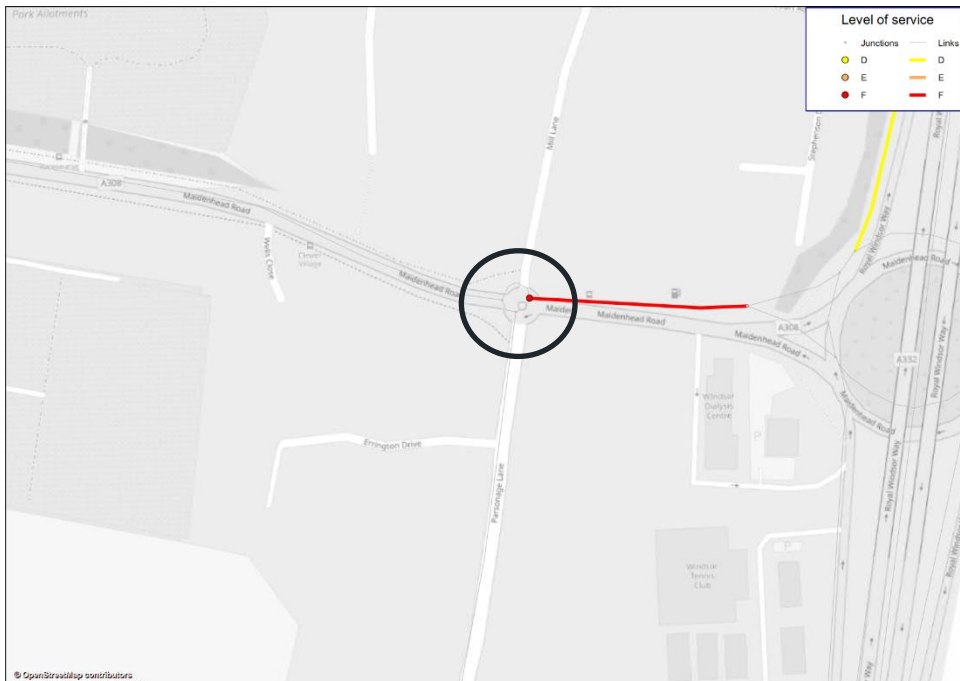


Figure 4.30 Mill Lane, Scenario B PM LOS

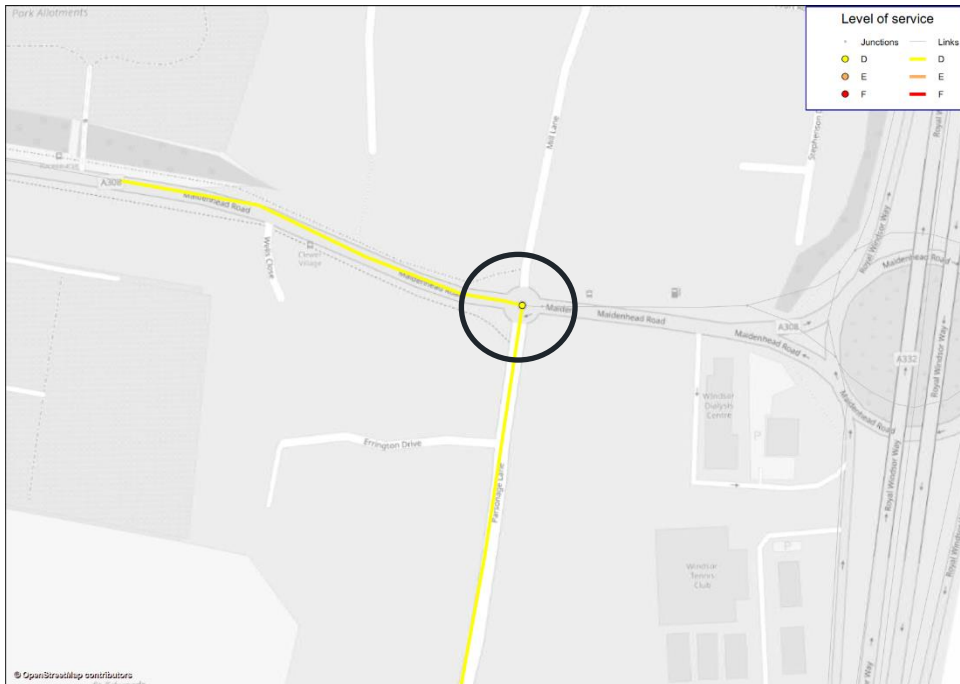


Figure 4.31 Mill Lane, Scenario C AM LOS

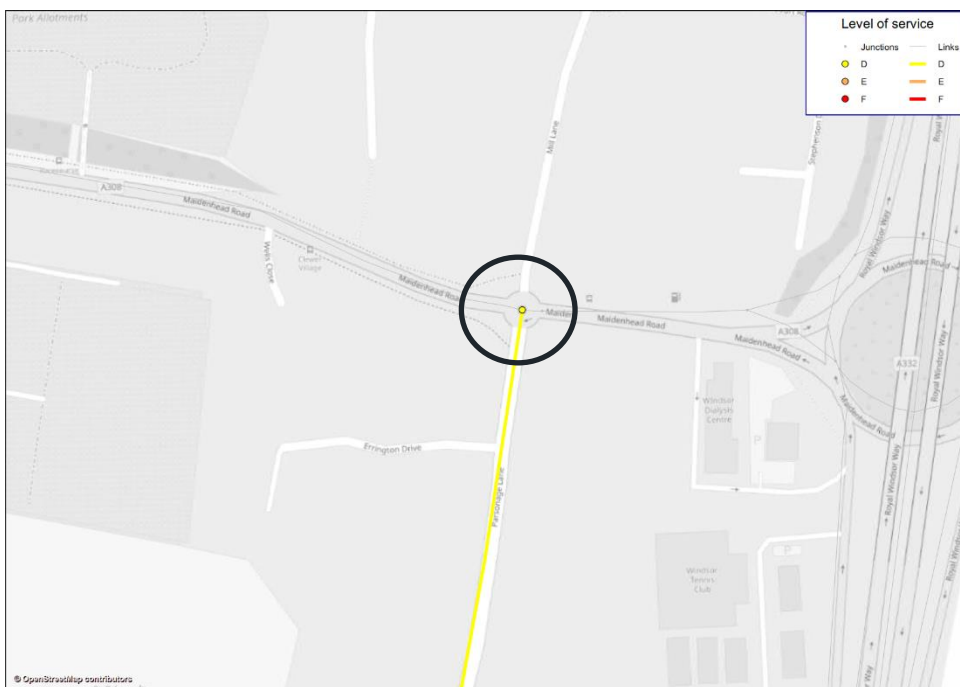


Figure 4.32 Mill Lane, Scenario C PM LOS

4.4.19. Whilst signalisation of the A308/ Mill Lane junction improves delays on the eastern approach, delays on the western and southern approaches increase. Since the traffic models represent average AM and PM peak hours, it is not possible to replicate MOVA operation at signalised junctions, which sets signal timings in such a way that they are more responsive to traffic conditions, leading to a significant increase in capacity at a junction. It is therefore recommended that localised junction modelling is undertaken at this junction to assess the impact of the proposed mitigation.

B3022/ KEATS LANE

4.4.20. The AM and PM LOS at the B3022/ Keats Lane junction for Scenario B and Scenario C is compared in Figure 4.33 to Figure 4.36.

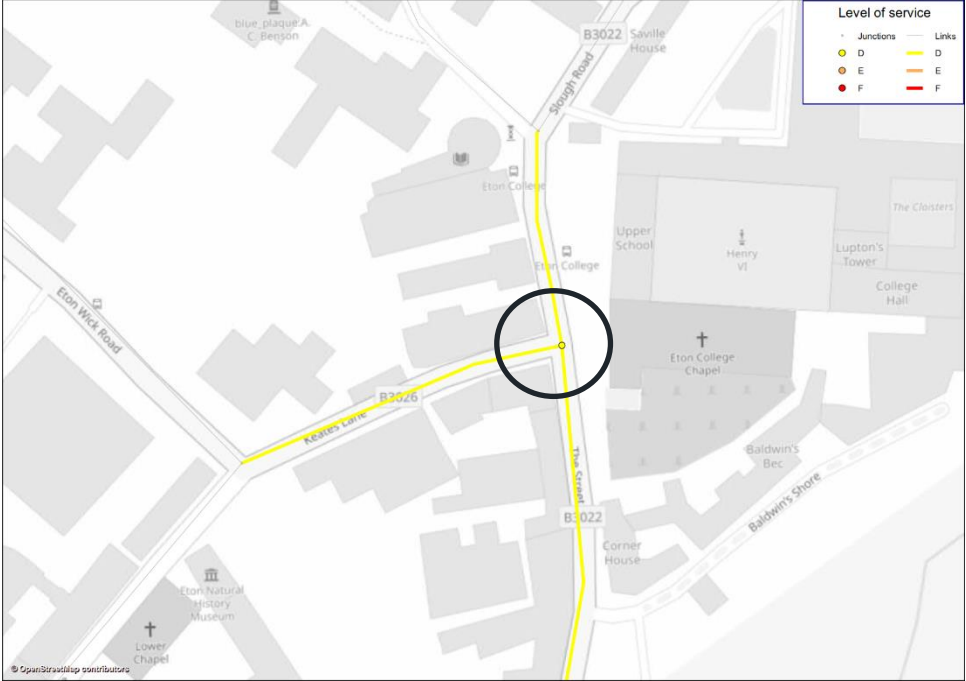


Figure 4.33 Keats Lane, Scenario B AM LOS

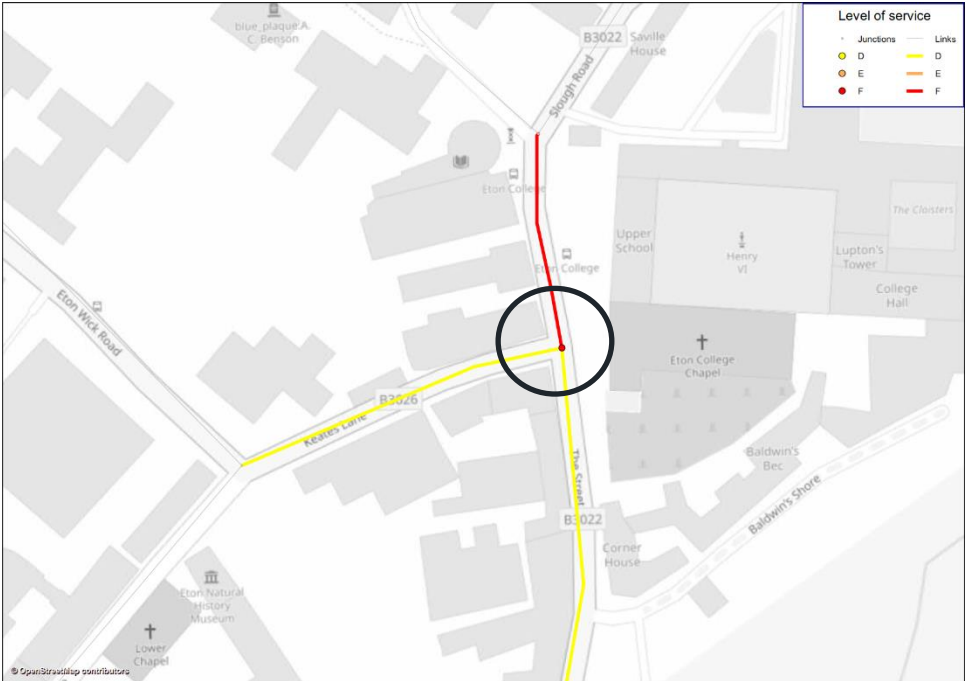


Figure 4.34 Keats Lane, Scenario B PM LOS

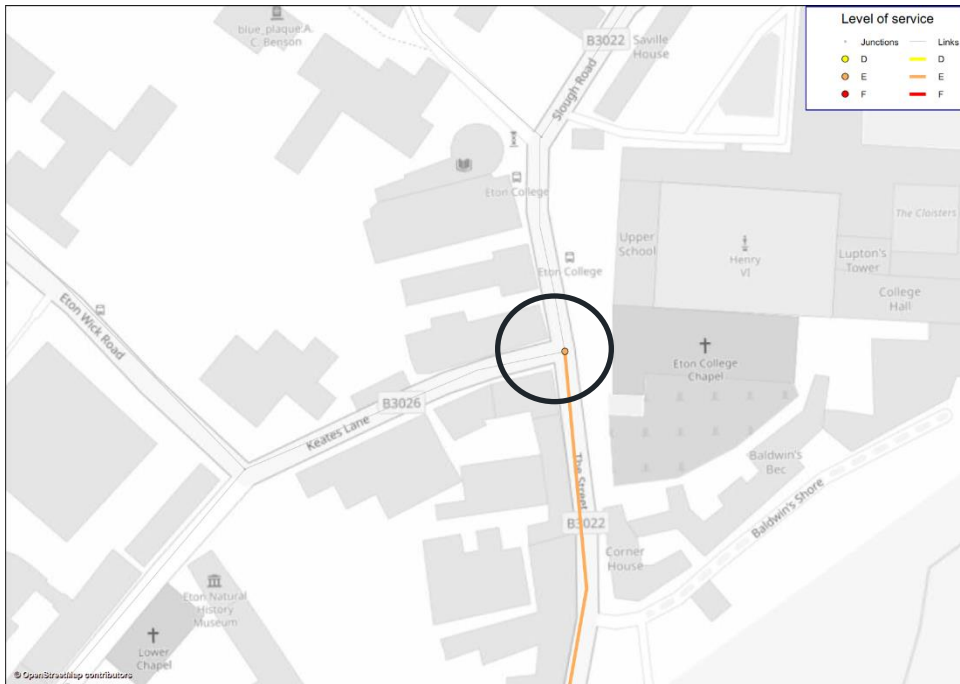


Figure 4.35 Keats Lane, Scenario C AM LOS

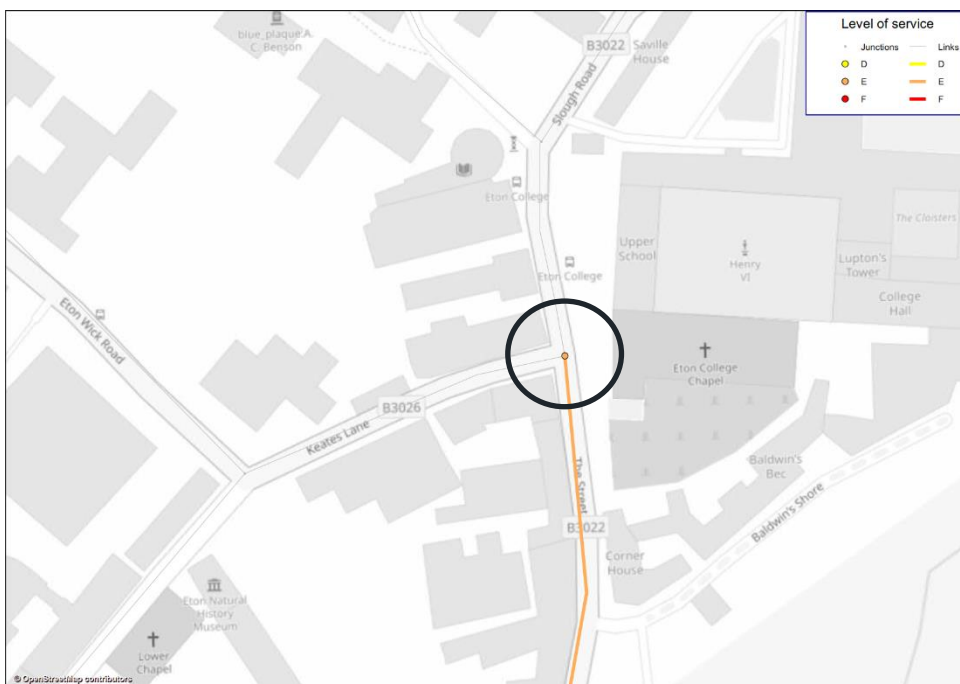


Figure 4.36 Keats Lane, Scenario C PM LOS

4.4.21. Whilst optimising signal timings at the B3022/ Keats Lane junction in Scenario C improves delays on the northern and western approaches, delays on the southern approach increase. Since the traffic models represent average AM and PM peak hours, it is not possible to replicate MOVA operation at signalised junctions. It is therefore recommended that localised junction modelling is undertaken at this junction to assess the impact of the proposed mitigation.

B3022 ST LEONARDS ROAD/ CLEWER HILL ROAD

4.4.22. The AM and PM LOS at the St Leonards Road/ Clewer Hill Road junction for Scenario B and Scenario C is compared in Figure 4.37 to Figure 4.40.

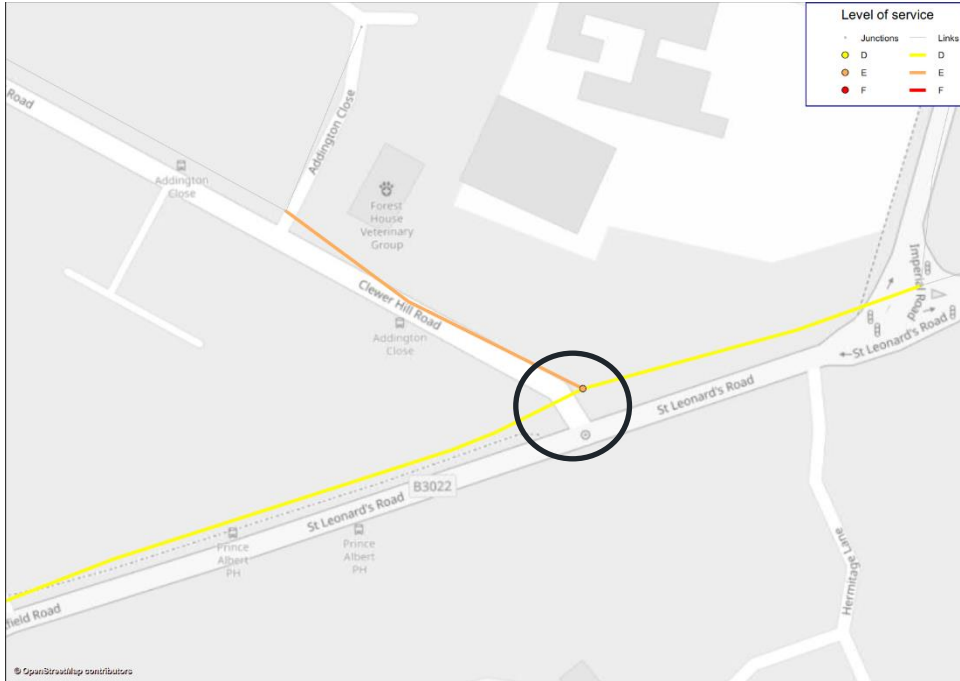


Figure 4.37 Clewer Hill Road, Scenario B AM LOS

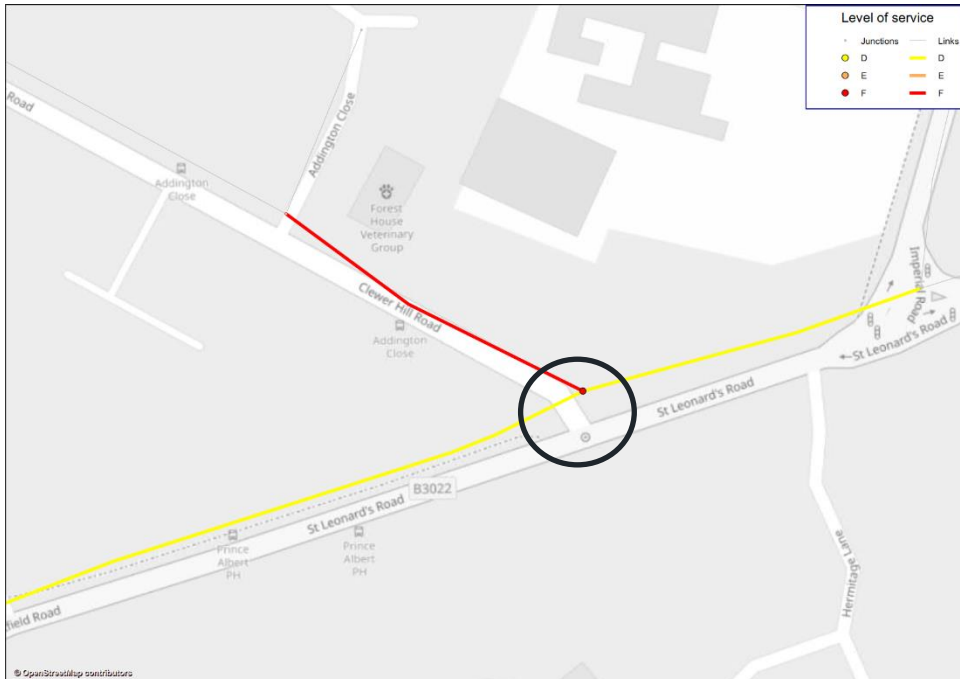


Figure 4.38 Clewer Hill Road, Scenario B PM LOS

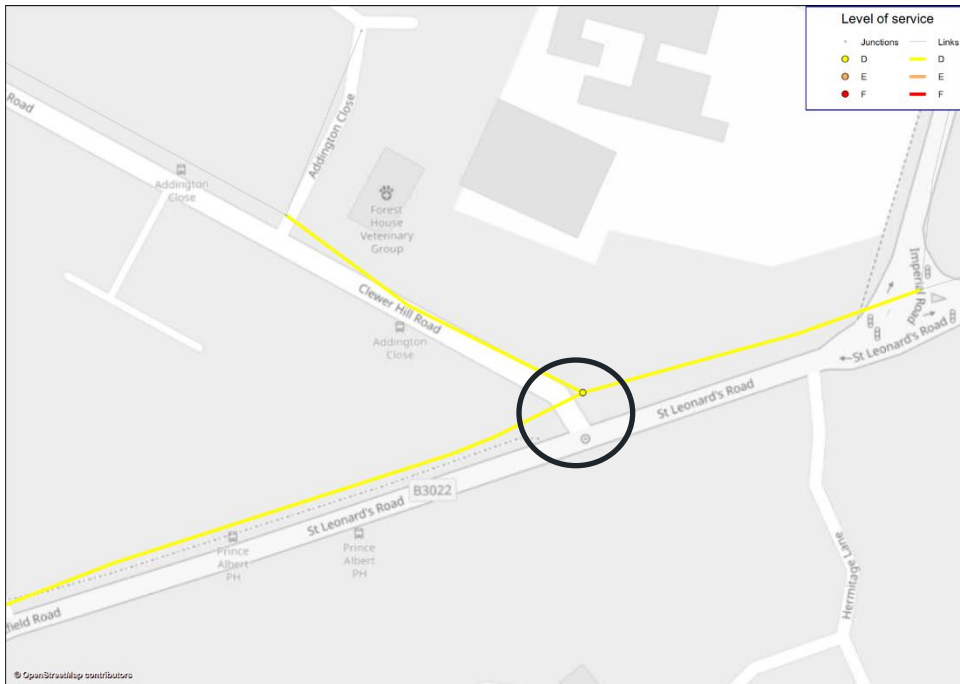


Figure 4.39 Clewer Hill Road, Scenario C AM LOS

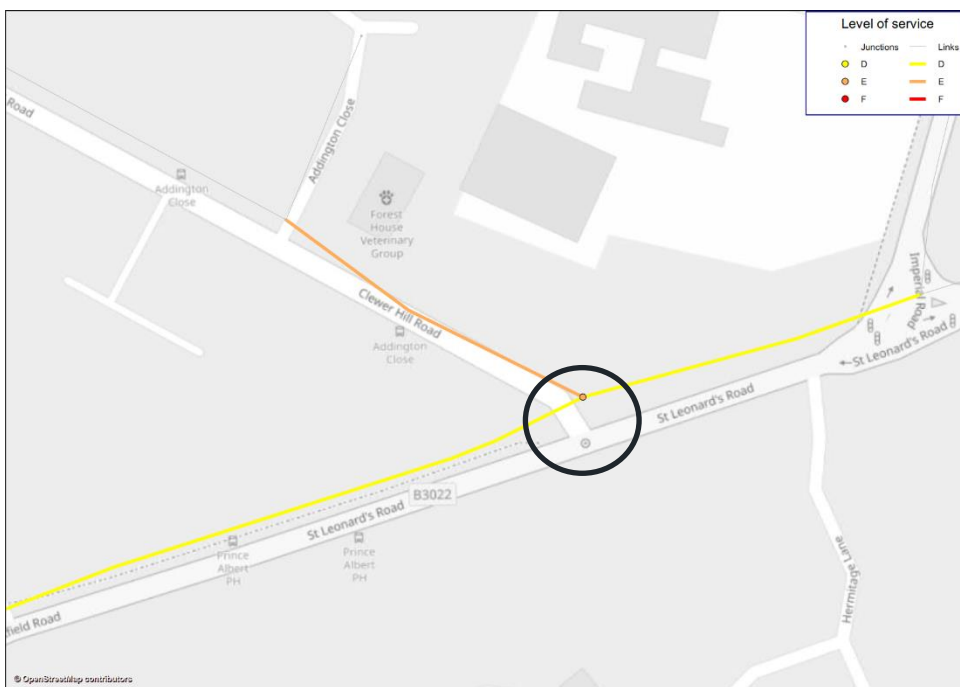


Figure 4.40 Clewer Hill Road, Scenario C PM LOS

- 4.4.23. Whilst optimising signal timings at the St Leonards Road/ Clewer Hill Road junction in Scenario C improves delays on the Clewer Hill Road approach, the junction still experiences congestion issues. Since the traffic models represent average AM and PM peak hours, it is not possible to replicate MOVA operation at signalised junctions. It is therefore recommended that localised junction modelling is undertaken at this junction to assess the impact of the proposed mitigation.

A4/ A404(M) THE THICKET ROUNDABOUT

4.4.24. The AM and PM LOS at The Thicket Roundabout for Scenario B and Scenario C is compared in Figure 4.41 to Figure 4.44.

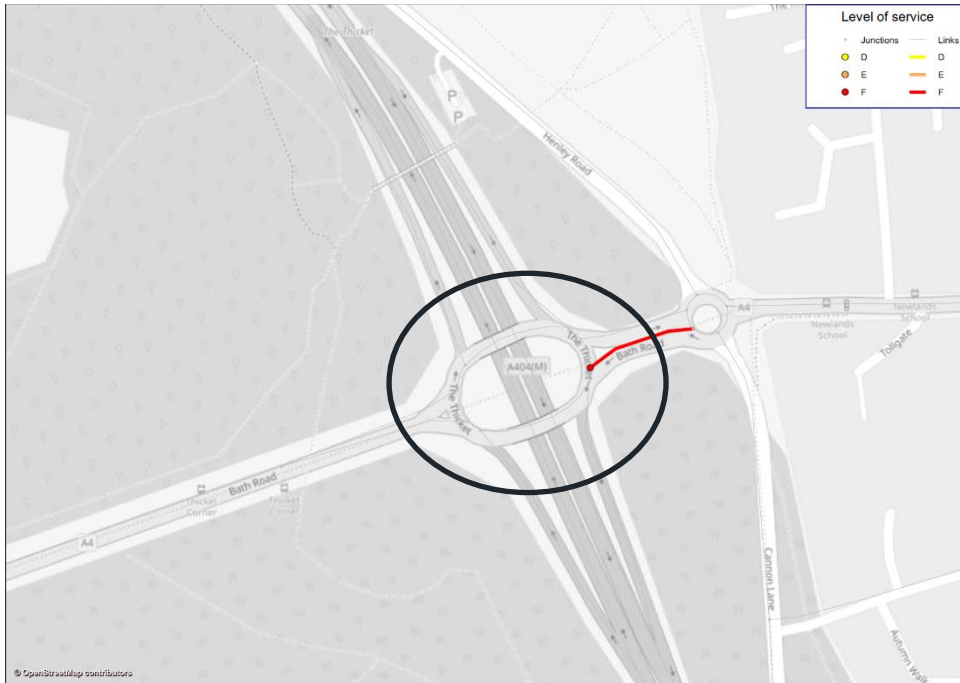


Figure 4.41 The Thicket Roundabout, Scenario B AM LOS



Figure 4.42 The Thicket Roundabout, Scenario B PM LOS

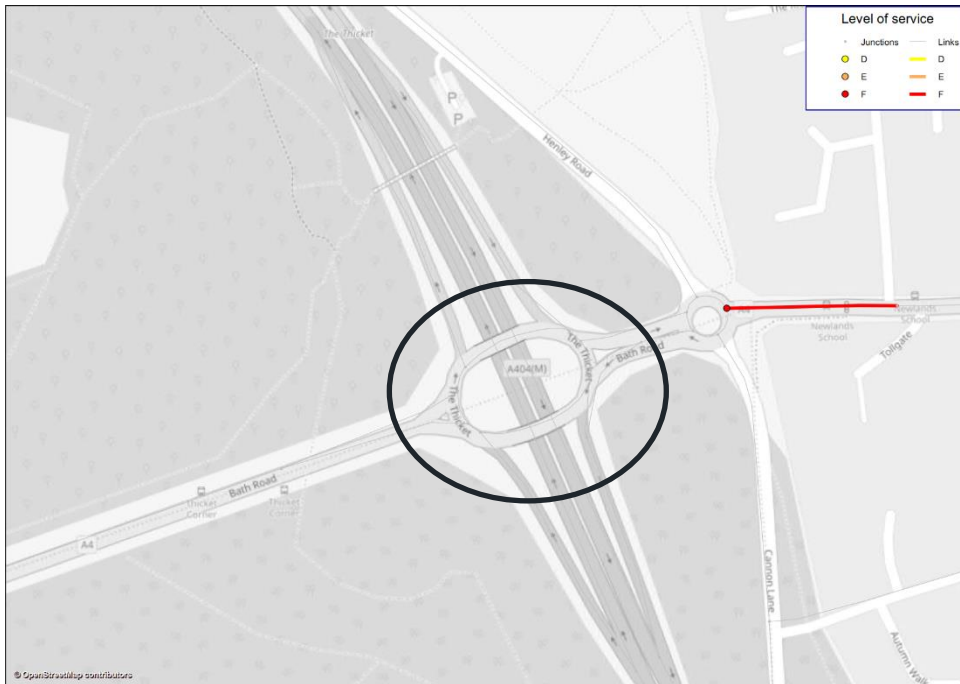


Figure 4.43 The Thicket Roundabout, Scenario C AM LOS

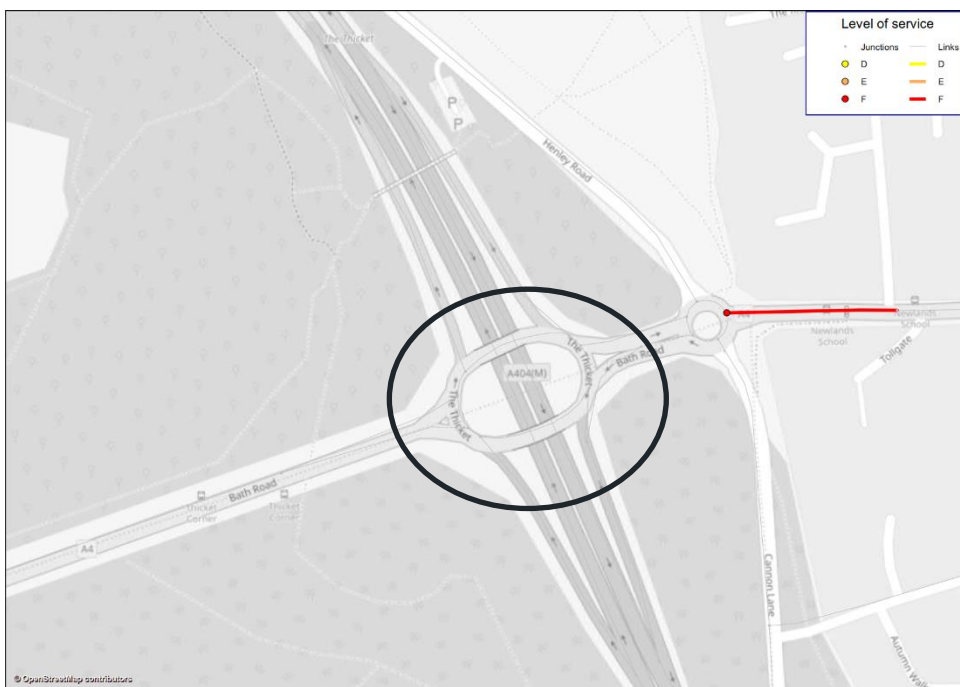


Figure 4.44 The Thicket Roundabout, Scenario C PM LOS

4.4.25. The delay difference plots show that the proposed mitigation significantly reduces delays on the eastern approach to this junction in the AM and PM peak hours, and the junction performance improves to LOS below D.

A332/ A329 HEATHERWOOD ROUNDABOUT

4.4.26. The AM and PM LOS at the Heatherwood Roundabout for Scenario B and Scenario C is compared in Figure 4.45 to Figure 4.48.

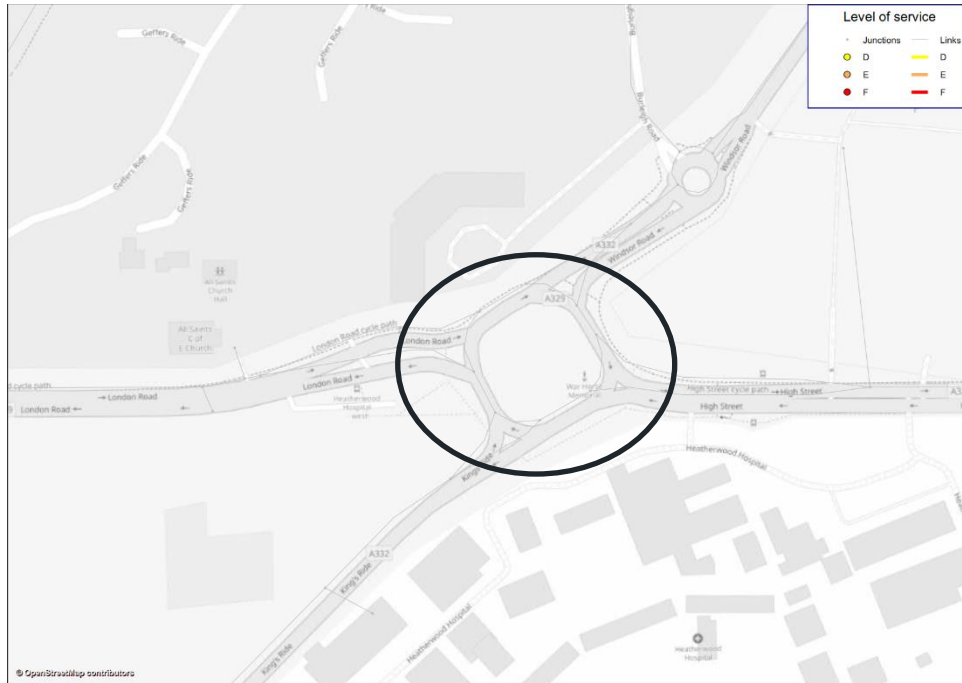


Figure 4.45 Heatherwood Roundabout, Scenario B AM LOS

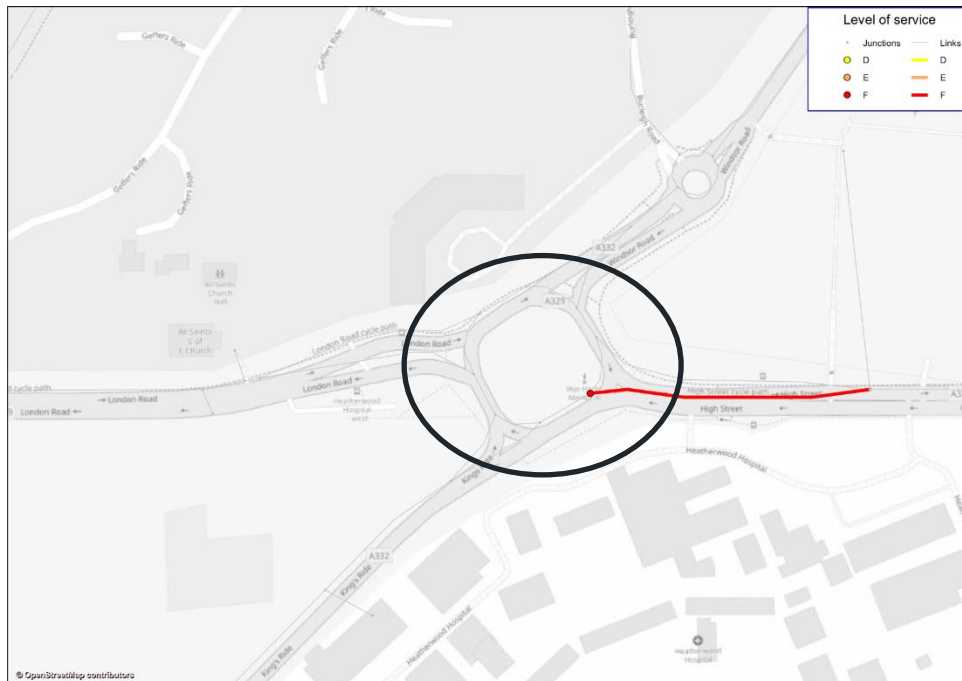


Figure 4.46 Heatherwood Roundabout, Scenario B PM LOS

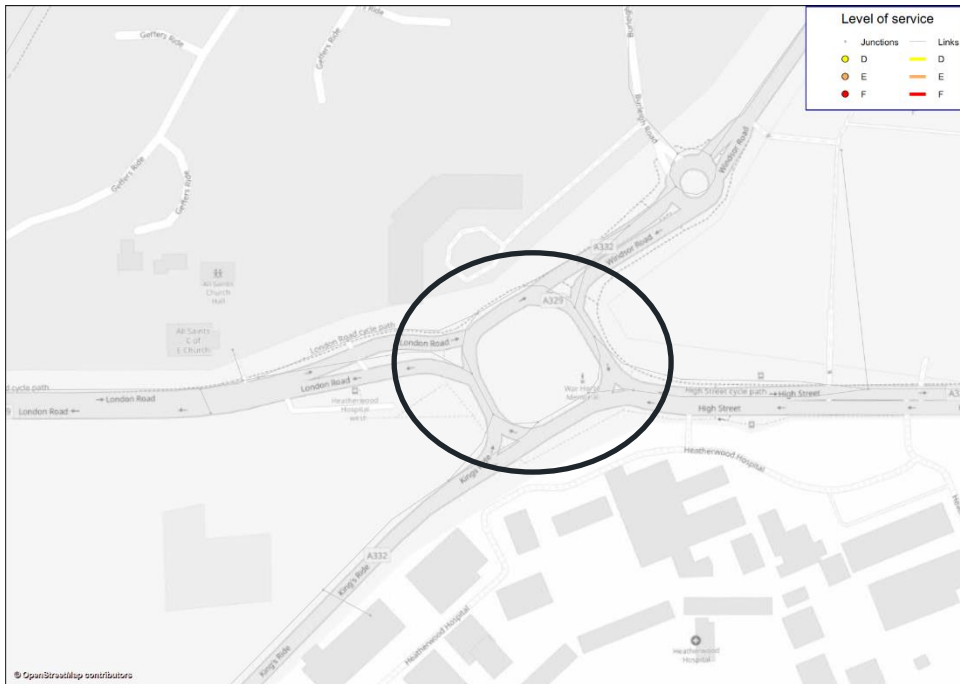


Figure 4.47 Heatherwood Roundabout, Scenario C AM LOS

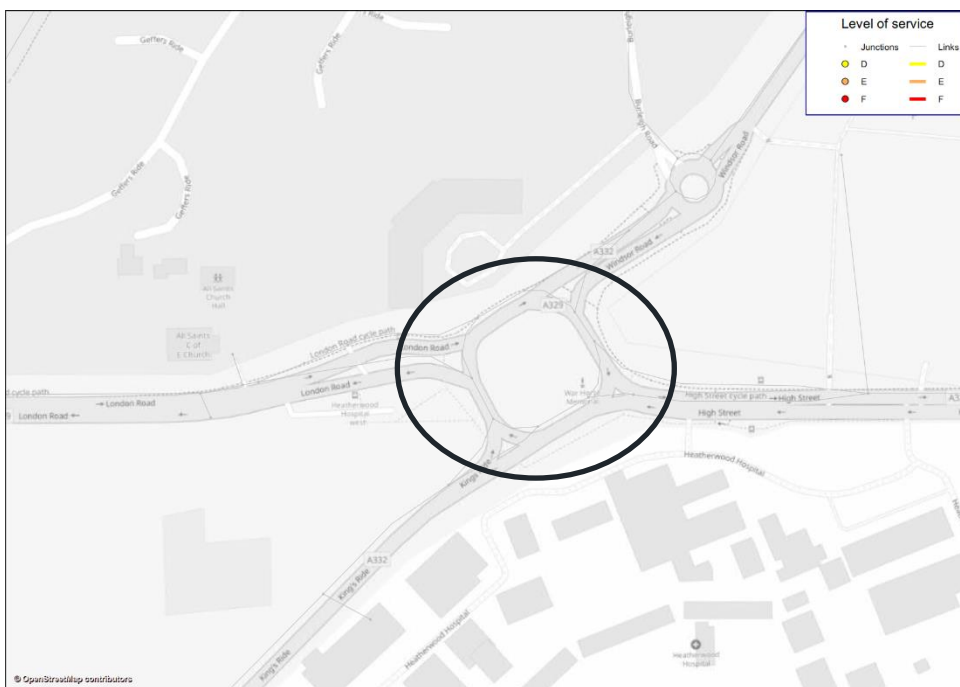


Figure 4.48 Heatherwood Roundabout, Scenario C PM LOS

4.4.27. The mitigation proposed at the Heatherwood Roundabout reduces delays in the AM and PM peak hours of Scenario C, and the junction performance improves to LOS below D.

4.5 JOURNEY TIMES

- 4.5.1. The results of the nine journey time routes are shown in Table 4.1 and Table 4.2. The tables demonstrate the absolute difference (in seconds) and percentage difference between Scenario C vs Scenario B and Scenario C vs Scenario A.
- 4.5.2. Graphs comparing the journey times for each scenario can be found in Appendix H. The journey time routes are plotted by distance to identify whether the mitigation schemes improve delays along the routes. A detailed list of all the timing point used for the assessment is also presented in Appendix H.

Table 4.1 AM journey time summary, Scenario C

Route		Scenario A 2033 Modelled (s)	Scenario B 2033 Modelled (s)	Scenario C 2033 Modelled (s)	Scenario C vs Scenario A		Scenario C vs Scenario B	
ID	Name				Absolute	Percentage	Absolute	Percentage
1	JT 1- EB	2,203	2,378	2,279	76	3%	-99	-4%
2	JT 1 - WB	2,037	2,294	2,176	139	7%	-118	-5%
3	JT 2- NB	1,729	2,094	1,921	191	11%	-174	-8%
4	JT 2 - SB	1,928	2,144	1,995	67	3%	-150	-7%
5	JT 3 - EB	2,318	2,364	2,377	59	3%	13	1%
6	JT 3 - WB	2,223	2,425	2,423	200	9%	-2	0%
7	JT 4 - NB	1,575	1,553	1,590	14	1%	37	2%
8	JT 4 - SB	1,662	1,695	1,676	14	1%	-19	-1%
9	JT 5 - WB	2,173	2,306	2,205	32	1%	-101	-4%
10	JT 5 - EB	2,143	2,355	2,130	-14	-1%	-225	-10%
11	JT 6 - NB	2,513	2,533	2,515	3	0%	-18	-1%
12	JT 6 - SB	1,774	1,792	1,758	-16	-1%	-34	-2%
13	JT 7 - CW	914	921	920	6	1%	-1	0%
14	JT 7 - ACW	954	958	969	16	2%	11	1%
15	JT 8 - EB	1,396	1,474	1,393	-4	0%	-81	-5%
16	JT 8 - WB	898	911	915	17	2%	4	0%
17	JT 9 - EB	929	898	856	-73	-8%	-42	-5%
18	JT 9 - WB	746	896	864	118	16%	-32	-4%

Table 4.2 PM journey time summary, Scenario C

Route		Scenario A 2033 Modelled (s)	Scenario B 2033 Modelled (s)	Scenario C 2033 Modelled (s)	Scenario C vs Scenario A		Scenario C vs Scenario B	
ID	Name				Absolute	Percentage	Absolute	Percentage
1	JT 1- EB	2,122	2,235	2,181	59	3%	-54	-2%
2	JT 1 - WB	2,082	2,320	2,189	107	5%	-132	-6%
3	JT 2- NB	1,575	1,660	1,708	132	8%	48	3%
4	JT 2 - SB	1,908	2,073	2,060	152	8%	-14	-1%
5	JT 3 - EB	2,202	2,276	2,272	71	3%	-3	0%
6	JT 3 - WB	2,258	2,451	2,445	187	8%	-5	0%
7	JT 4 - NB	1,597	1,511	1,583	-14	-1%	72	5%
8	JT 4 - SB	1,900	1,899	1,944	44	2%	45	2%
9	JT 5 - WB	2,097	2,587	2,229	132	6%	-358	-14%
10	JT 5 - EB	2,160	2,373	2,179	19	1%	-194	-8%
11	JT 6 - NB	2,270	2,258	2,256	-14	-1%	-2	0%
12	JT 6 - SB	1,868	1,903	1,846	-23	-1%	-58	-3%
13	JT 7 - CW	871	882	882	11	1%	0	0%
14	JT 7 - ACW	902	904	913	12	1%	10	1%
15	JT 8 - EB	1,457	1,341	1,376	-81	-6%	36	3%
16	JT 8 - WB	951	1,000	973	22	2%	-27	-3%
17	JT 9 - EB	816	739	738	-78	-10%	0	0%
18	JT 9 - WB	821	901	854	33	4%	-46	-5%

- 4.5.3. The proposed mitigation introduced in Scenario C improves travel times along the majority of the journey time routes compared to Scenario B.
- 4.5.4. However, there are some routes along which the mitigation introduced further delays. The biggest absolute increase in journey time in Scenario C compared to Scenario B is the 72s increase in travel time experienced northbound along route 4 in the PM peak hour.
- 4.5.5. The comparison of the Scenario C and Scenario A journey times show that the introduction of the mitigation schemes does not fully mitigate the Local Plan development, as journey times generally remain higher than the levels experienced with no Local Plan development. This is particularly noticeable in the routes through Maidenhead town centre, due to the proximity of many Local Plan development sites.
- 4.5.6. It should be noted that the trip rates for Maidenhead town centre sites are likely to be lower than the trip rates used for the Local Plan developments due to very low levels of parking provision in this location. Furthermore, the trip rates used for the Local Plan sites do not take account of the potential mode shift which could be delivered through the placemaking work, and therefore represent a worst-case scenario. Using reduced trip rates which take account of potential mode shift may be able to fully mitigate the impact of the Local Plan development on the highway network.

4.6 NETWORK STATISTICS

- 4.6.1. The overall network statistics for Scenario A, Scenario B and Scenario C have been compared to further understand the impact of the proposed mitigation schemes.
- 4.6.2. The network statistics for both time periods in each of the scenarios as well as comparisons between the different scenarios are shown in Table 4.3 and Table 4.4. The tables demonstrate the absolute difference and percentage difference between Scenario C vs Scenario B and Scenario C vs Scenario A.

Table 4.3 AM network statistics, Scenario C

Statistic	Unit	Scenario A	Scenario B	Scenario C	Scenario C vs Scenario A		Scenario C vs Scenario B	
					Absolute	Percentage	Absolute	Percentage
Over-capacity Queues	Veh-Hrs	1,871.7	2,217.2	1,940.1	68.4	4%	-277.0	-12%
Link Cruise Time	Veh-Hrs	55,737.6	56,225.0	56,249.9	512.2	1%	24.8	0%
Total Travel Time	Veh-Hrs	84,318.1	85,402.5	85,254.1	936.0	1%	-148.4	0%
Total Link Delay	Veh-Hrs	28,580.5	29,177.4	29,004.2	423.7	1%	-173.2	-1%
Total Network Delay	Veh-Hrs	29,397.5	30,181.9	30,083.0	685.5	2%	-98.9	0%
Total Travel Distance	Veh-kms	4,542,299.6	4,575,279.4	4,576,808.1	34,508.5	1%	1,528.7	0%
Average Speed	kmph	53.9	53.6	53.7	-0.2	0%	0.1	0%

Table 4.4 PM network statistics, Scenario C

Statistic	Unit	Scenario A	Scenario B	Scenario C	Scenario C vs Scenario A		Scenario C vs Scenario B	
					Absolute	Percentage	Absolute	Percentage
Over-capacity Queues	Veh-Hrs	1,752.6	1,979.1	1,755.3	2.7	0%	-223.8	-11%
Link Cruise Time	Veh-Hrs	58,957.3	59,357.5	59,416.5	459.2	1%	59.0	0%
Total Travel Time	Veh-Hrs	94,745.3	95,538.1	95,429.2	683.9	1%	-109.0	0%
Total Link Delay	Veh-Hrs	35,788.0	36,180.7	36,012.7	224.7	1%	-168.0	0%
Total Network Delay	Veh-Hrs	35,495.0	36,123.6	35,938.5	443.4	1%	-185.1	-1%
Total Travel Distance	Veh-kms	4,859,255.5	4,885,533.7	4,888,050.4	28,794.9	1%	2,516.6	0%
Average Speed	kmph	51.3	51.1	51.2	-0.1	0%	0.1	0%

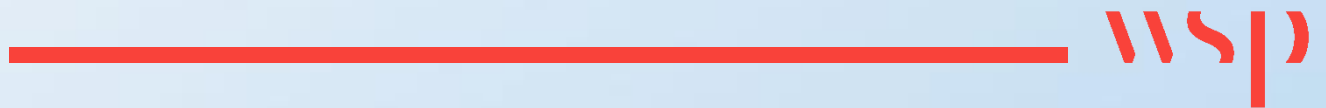
- 4.6.13. The introduction of the mitigation schemes in Scenario C reduces the number over-capacity queues compared to Scenario B. The overall network delay and travel time also decreases as junction performance improves.
- 4.6.14. The comparison of the Scenario C and Scenario A network statistics show that the introduction of the mitigation schemes does not fully mitigate the Local Plan development, as travel times and delays remain slightly higher than the levels experienced without Local Plan development.
- 4.6.15. It should be noted that the trip rates for Maidenhead town centre sites are likely to be lower than the trip rates used for the Local Plan developments due to very low levels of parking provision in this location. Furthermore, the trip rates used for the Local Plan sites do not take account of the potential mode shift which could be delivered through the placemaking work, and therefore represent a worst-case scenario. Using reduced trip rates which take account of potential mode shift may be able to fully mitigate the impact of the Local Plan development on the highway network.

5 SUMMARY AND CONCLUSIONS

- 5.1.1. This report forms part of a transport evidence base for the assessment of the housing and employment development sites in the RBWM Local Plan, and will inform the associated Infrastructure Delivery Plan.
- 5.1.2. Three 2033 forecast scenarios have been developed to analyse the impact of the allocated housing and employment:
- Scenario A: includes planned development outside the borough and committed development in the borough but does not include the Local Plan development in the borough;
 - Scenario B: based on Scenario A but also includes Local Plan development in the borough; and
 - Scenario C: based on Scenario B but also includes transport interventions that may be required to mitigate the impact of the Local Plan developments.
- 5.1.3. The forecasting approach followed is consistent with the DfT's TAG guidance for developing traffic model forecasts. Outside the borough NTEM projections and NRTF factors were used to calculate car and LGV/HGV growth, and within the borough TRICS trip rates were used to calculate the trip generation arising from planned housing and employment sites.
- 5.1.4. The forecast scenarios have been assessed and there is a step change in the traffic impacts at Scenario A compared to the Base, and then a further worsening of traffic conditions in Scenario B due to the introduction of the Local Plan development.
- 5.1.5. Scenario A and Scenario B have been compared and a number of 'failing' junctions have been identified. Mitigation measures have been proposed for these junctions, and these have been coded into Scenario C. The inclusion of mitigation schemes in Scenario C improves network performance compared to Scenario B, with a general decrease in delays and a reduction in journey times.
- 5.1.6. Comparison of Scenario A and Scenario C journey times and network statistics show that the introduction of the mitigation schemes does not fully mitigate the Local Plan development, particularly in Maidenhead town centre. It should be noted that the trip rates used for the Local Plan sites do not take account of the potential mode shift which could be delivered through the placemaking work, and therefore represent a worst-case scenario. Using reduced trip rates which take account of potential mode shift may be able to fully mitigate the impact of the Local Plan development on the highway network.
- 5.1.7. It should be noted that since VISUM is a strategic modelling software, it is not able to accurately assess some of the proposed mitigation schemes. It is therefore recommended that localised junction modelling is undertaken at several locations using specialist software such as LINSIG or Junctions 9.
-

Appendix A

COMMITTED DEVELOPMENTS



Appendix B

COMMITTED INFRASTRUCTURE



Appendix C

LOCAL PLAN SITES



Appendix D

LOCAL PLAN INFRASTRUCTURE



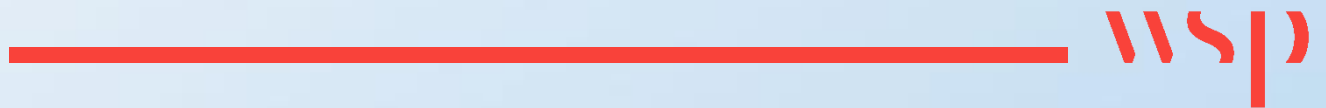
Appendix E

MITIGATION SCHEMES



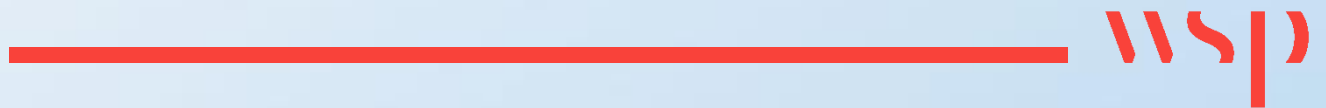
Appendix F

LOCAL AREA PLOTS



Appendix G

WIDER AREA PLOTS



Appendix H

JOURNEY TIMES

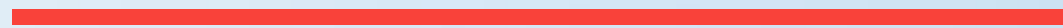


Table H.1 Timing points

Name	TP	Description
JT 1 EB	1	A308 - Marlow Road/A404
	2	A308 - Marlow Road/Lee Lane
	3	A308 - Furze Platt Road/Winter Hill Road
	4	A308 - Furze Platt Road/Pinkneys Drive
	5	A308 - Furze Platt Road/Switchback Road South
	6	A308 - Furze Platt Road/Courthouse Road
	7	A308 - Gringer Hill/Harrow Lane
	8	A308 - Crauford Rise/Norfolk Road
	9	A308 - Marlow Road/A4 - Castle Hill
	10	A308 - Frascati Way/Broadway
	11	Broadway/Queen St
	12	Queen Street/A308 - Grenfell Road
	13	A308 - Braywick Road/Shoppenhangers Road EB/SB
	14	A308 - Braywick Road/Stafferton Way
	15	A308 - Windsor Road/Harvest Hill Road
	16	A308 - Windsor Road/A308(M)
	17	A308 - Windsor Road/Fifield Road
	18	A308 - Windsor Road/Oakley Green Road
	19	A308 - Windsor Road/Ruddlesway
	20	A308 - Maidenhead Road/B3025
	21	A308 - Maidenhead Road/A332
	22	A308 - Goslar Way/B3173 Imperial Road
	23	B3173 - Imperial Road - St Leonards Road
	24	B3022 - St Leonards Road/Bolton Road
	25	A308 - Alma Road/B3022 - St Leonards Road
	26	A308 - Goslar Way/A308 - Alma Road
	27	A308 - Osborne Road/A308 - Frances Road
	28	A308 Osborne Road/A332 - King's Road
	29	A308 - Albert Road/B3021 - Datchet Road
JT 1 WB	1	A308 - Albert Road/B3021 - Datchet Road
	2	A308 Osborne Road/A332 - King's Road
	3	A308 - Osborne Road/A308 - Frances Road
	4	A308 - Alma Road/B3022 - St Leonards Road
	5	B3022 - St Leonards Road/Bolton Road

Name	TP	Description
	6	B3173 - Imperial Road - St Leonards Road
	7	A308 - Goslar Way/B3173 Imperial Road
	8	A308 - Maidenhead Road/A332
	9	A308 - Maidenhead Road/B3025
	10	A308 - Windsor Road/Ruddlesway
	11	A308 - Windsor Road/Oakley Green Road
	12	A308 - Windsor Road/Fifield Road
	13	A308 - Windsor Road/Upper Bray Road
	14	A308 - Windsor Road/A308(M)
	15	A308 - Windsor Road/Harvest Hill Road
	16	A308 - Braywick Road/Stafferton Way
	17	A308 - Braywick Road/Shoppenhangers Road
	18	A308 - Grenfell Place/Grenfell Road
	19	A308 - Frascati Way/Broadway
	20	A308 - Marlow Road/A4 - Castle Hill
	21	A308 - Crauford Rise/Norfolk Road
	22	A308 - Gringer Hill/Harrow Lane
	23	A308 - Furze Platt Road/Courthouse Road
	24	A308 - Furze Platt Road/Switchback Road South
	25	A308 - Furze Platt Road/Pinkneys Drive
	26	A308 - Furze Platt Road/Winter Hill Road
	27	A308 - Marlow Road/Lee Lane
	28	A308 - Marlow Road/A404
JT 2 NB	1	M4/A329(M)
	2	M4/A404(M)
	3	A404(M) Off-slip
	4	A404(M) Off-slip/Shoppenhangers Road
	5	Shoppenhangers Road/Norreys Drive
	6	Shoppenhangers Road/Harvest Hill Road
	7	A308 - Braywick Road/Shoppenhangers Road
	8	A308 - Grenfell Place/Grenfell Road
	9	A308 - Frascati Way/Broadway
	10	A308 - Marlow Road/A4 - Castle Hill
	11	A4 - Bad Godesburg Way/B4447 - Cookham Road
	12	B4447 - Cookham Road/Ray Mill Road West
	13	B4447 - Cookham Road/Harrow Lane

Name	TP	Description
	14	B4447 Gardner Road/MaidenHead Road (South)
	15	B4447 - Gardner Road/Switchback Road North
	16	B4447 - Switchback Road North/Long Lane
	17	B4447 - Maidenhead Road/The Pound
	18	A4094 - Sutton Road/B4447 - High St
	19	A4094 - Ferry Lane/River Thames
JT 2 SB	1	A4094 - Ferry Lane/River Thames
	2	A4094 - Sutton Road/B4447 - High St
	3	B4447 - Maidenhead Road/The Pound
	4	B4447 - Switchback Road North/Long Lane
	5	B4447 - Gardner Road/Switchback Road North
	6	B4447 Gardner Road/MaidenHead Road (South)
	7	B4447 - Cookham Road/Harrow Lane
	8	B4447 - Cookham Road/Ray Mill Road West
	9	A4 - Bad Godesburg Way/B4447 - Cookham Road
	10	A308 - Marlow Road/A4 - Castle Hill
	11	A308 - Frascati Way/Broadway
	12	A308 - Grenfell Place/Grenfell Road
	13	A308 - Braywick Road/Shoppenhangers Road
	14	Shoppenhangers Road/Harvest Hill Road
	15	Shoppenhangers Road/Norreys Drive
	16	A404(M) On-Slip
	17	M4/A404(M)
	18	M4/A329(M)
JT 3 EB	1	A4 - Bath Road/A404(M)
	2	A4 - Bath Road/Henley Road
	3	A4 - Bath Road/Highway Ave
	4	A4 - Bath Road/Woototon Way
	5	A4 - Bath Road/Courthouse Road
	6	A4 Bath Road/All Saints Ave
	7	A4 - Bath Road/St Mark's Road
	8	A308 - Marlow Road/A4 - Castle Hill
	9	A4 - Bad Godesburg Way/B4447 - Cookham Road
	10	A4 - Saint-Cloud Way/Forlease Road
	11	A4 - Bridge Road/Oldfield Road
	12	A4 - Bridge Road/A4094 - Ray Mead Road

Name	TP	Description	
	13	A4 - Bath Road/Berry Hill	
	14	A4 - Bath Road/Station Road	
	15	A4 - Bath Road/Lake End Road	
	16	A4 - Bath Road/M4	
	17	A4 - Bath Road/Elmshott Lane	
	18	A4 - Bath Road/Dover Road	
	19	A4 - Bath Road/Leigh Road	
	20	A4 - Bath Road/A355 -Farnham Road	
	21	A4 - Wellington St/B416 - Stoke Road	
	22	Windsor Road/A412 - Chalvey East WB	
	23	A332 - Slough Road/B3022 - Slough Road	
	24	A332/A355	
	25	A332 On-slip/A308 - Maidenhead Road SB	
	26	A308 - Maidenhead Road/A332	
	27	Arthur Road/Charles St	
	28	River St/B3022	
	29	B3022 - Frances Road/Kings Road	
	30	A308 - Osborne Road/B3022 - Frances Road	
	JT 3 WB	1	A308 - Osborne Road/B3022 - Frances Road
		2	B3022 - Frances Road/Kings Road
		3	River St/B3022
		4	Arthur Road/Charles St
		5	A308 - Maidenhead Road/A332
		6	A332/A355
		7	A332 - Slough Road/B3022 - Slough Road
		8	A332 - Windsor Road/A412 - Chalvey East WB
		9	A332 - Windsor Road/High St
		10	A4 - Wellington St/High St
		11	A4 - Bath Road/A355 -Farnham Road
		12	A4 - Bath Road/Leigh Road
13		A4 - Bath Road/Dover Road	
14		A4 - Bath Road/Elmshott Lane	
15		A4 - Bath Road/M4	
16		A4 - Bath Road/Lake End Road	
17		A4 - Bath Road/Station Road	
18		A4 - Bath Road/Berry Hill	

Name	TP	Description
	19	A4 - Bridge Road/A4094 - Ray Mead Road
	20	A4 - Bridge Road/Oldfield Road
	21	A4 - Saint-Cloud Way/Forlease Road
	22	A4 - Bad Godesburg Way/B4447 - Cookham Road
	23	A308 - Marlow Road/A4 - Castle Hill
	24	A4 - Bath Road/St Mark's Road
	25	A4 Bath Road/All Saints Ave
	26	A4 - Bath Road/Courthouse Road
	27	A4 - Bath Road/Woototon Way
	28	A4 - Bath Road/Highway Ave
	29	A4 - Bath Road/Henley Road
	30	A4 - Bath Road/A404(M)
JT 4 NB	1	A332 - Windsor Road/A329 - London Road
	2	A332 - Windsor Road/Burleigh Road
	3	A332- Windsor Road/Kennel Ave
	4	A330 - Winkfield Road/A332 - Windsor Road
	5	A332 - Windsor Road/Lovel Lane
	6	A332 - Windsor Road/B383 - Sunninghill Road
	7	A308 Osbourne Road/A332 - King's Road
	8	A308 - Osborne Road/A308 - Frances Road
	9	A308 - Alma Road/B3022 - St Leonards Road
	10	A308 - Goslar Way/A308 - Alma Road
	11	A308 - Goslar Way/A332 NB
	12	A332 Off-slip/A308 - Maidenhead Road
	13	A332/A355
	14	A355 - Tuns Lane/M4
	15	A355 - Tuns lane/ Cippenham Lane
	16	A355 - Tuns Lane/A4 - Bath Road
	17	A355 Farnham Road/Buckingham Ave
	18	A355 Farnham Road/Edinburgh Ave
	19	A355 - Farnham Road/Northborough Road
JT 4 SB	1	A355 - Farnham Road/Northborough Road
	2	A355 Farnham Road/Edinburgh Ave
	3	A355 Farnham Road/Buckingham Ave
	4	A355 - Tuns Lane/A4 - Bath Road
	5	A355 - Tuns lane/ Cippenham Lane

Name	TP	Description	
	6	A355 - Tuns Lane/M4	
	7	A332/A355	
	8	A332 On-slip/A308 - Maidenhead Road	
	9	A308 - Goslar Way/A332	
	10	A308 - Goslar Way/A308 - Alma Road	
	11	A308 - Osborne Road/A308 - Frances Road	
	12	A308 Osbourne Road/A332 - King's Road	
	13	A332 - Windsor Road/B383 - Mounts Hill	
	14	A332 - Windsor Road/Lovel Lane	
	15	A330 - Winkfield Road/A332 - Windsor Road	
	16	A332- Windsor Road/Kennel Ave	
	17	A332 - Windsor Road/Burleigh Road	
	18	A332 - Windsor Road/A329 - London Road	
	JT 5 WB	1	A330 - Winkfield Road/A329 London Rd
		2	A330 - Winkfield Road/A332 - Windsor Road
		3	A330 - Hatchet Lane/Forest Road
		4	A330 - Hatchet Lane/A330 Lovel Road
		5	A330 - Lovel Road/ North St
6		A330 - Maidens Green/B3022 - Bracknell Road	
7		A330 - Ascot Road/ A3095 - Maidenhead Road	
8		A330/Drift Road	
9		A330/B3024 (West)	
10		A330- Ascot Road/B3024 - Forest Green	
11		A330 - Ascot Road/ Holyport St	
12		A330 - Ascot Road/A308(M)	
13		A308 - Windsor Road/Upper Bray Road	
14		B3028 - Bray Road/Hibbert Road	
15		B3028 - Bray Road/Stafferton Road	
16		A4 - Bridge Road/Oldfield Road	
17		A4 - Bridge Road/A4094 - Ray Mead Road	
18		A4094 - Ray Mead Road/Ray Park Road	
19		A4094 - Ray Mead Road/Ray Mill Road East	
20		A4094 - Lower Cookham Road/Sheephouse Road	
21		A4094 - Sutton Road/B4447 - High St	
JT 5 EB	1	A4094 - Sutton Road/B4447 - High St	
	2	A4094 - Lower Cookham Road/Sheephouse Road	

Name	TP	Description	
	3	A4094 - Ray Mead Road/Ray Mill Road East	
	4	A4094 - Ray Mead Road/Ray Park Road	
	5	A4 - Bridge Road/A4094 - Ray Mead Road	
	6	A4 - Bridge Road/Oldfield Road	
	7	B3028 - Bray Road/Stafferton Road	
	8	B3028 - Bray Road/Hibbert Road	
	9	A308 - Windsor Road/Upper Bray Road	
	10	A308 - Windsor Road/A308 (M)	
	11	A330 - Ascot Road/ Holyport St	
	12	A330- Ascot Road/B3024 - Forest Green	
	13	A330/B3024 (West)	
	14	A330/Drift Road	
	15	A330 - Ascot Road/ A3095 - Maidenhead Road	
	16	A330 - Maidens Green/B3022 - Bracknell Road	
	17	A330 - Lovel Road/ North St	
	18	A330 - Hatchet Lane/A330 Lovel Road	
	19	A330 - Hatchet Lane/Forest Road	
	20	A330 - Winkfield Road/A332 - Windsor Road	
	21	A330 - Winkfield Road/A329 London Rd	
	JT 6 NB	1	A30 - London Road/A322- Bracknell Road
		2	A30- London Road/Grove End
3		A30 - London Road/B386	
4		A30 - London Road/B3020 Sunninghill Road	
5		A30- London Road/Snows Ride	
6		A30- London Road/Westwood Road	
7		A30 -London Road/A330- Devonish Road	
8		A30 - London Road/Charters Road	
9		A30 - London Road/B383- Broomhall Lane	
10		A30 - London Road/Chobham Road	
11		A30 - London Road/Bedford Lane	
12		A30 - London Road/A329 - Blacknest Road	
13		A30 - London Road/B389 -Christchurch Road	
14		A30 - London Road/A328- St Jude's Road	
15		A328 - Priest Hill/A308- Windsor Road	
16		A308 - Straight Road/A308 - Albert Road	
17		B3021 - Southlea Road/B470 - Windsor Road	

Name	TP	Description
	18	B470 - London Road/B376 - Horton Road
	19	B376 - Horton Road/B470 - Ditton Road
	20	B470 - Major's Farm Road/B470 Ditton Road
	21	B470 - Major's Farm Road A4
JT 6 SB	1	B470 - Major's Farm Road
	2	Major's Farm Road/B470 Ditton Road
	3	B376 - Horton Road/B470 - Ditton Road
	4	B470 - London Road/B376 - Horton Road
	5	B3021 - Southlea Road/B470 - Windsor Road
	6	A308 - Datchet Road/A308 - Albert Road SB
	7	A328 - Priest Hill/A308- Windsor Road
	8	A30 - London Road/A328- St Jude's Road
	9	A30 - London Road/B389 -Christchurch Road
	10	A30 - London Road/A329 - Blacknest Road
	11	A30 - London Road/Bedford Lane
	12	A30 - London Road/Chobham Road
	13	A30 - London Road/B383- Broomhall Lane
	14	A30 - London Road/Charters Road
	15	A30 -London Road/A330- Devonish Road
	16	A30- London Road/Westwood Road
	17	A30- London Road/Snows Ride
	18	A30 - London Road/B3020 Sunninghill Road
	19	A30 - London Road/B386
	20	A30- London Road/Grove End
	21	A30 - London Road/A322- Bracknell Road
JT 7 CW	1	A330- Station Hill/A329- High St WB
	2	A330 - Winkfield Road/A329 London Rd
	3	A329 - London Road.B3020- Sunninghill Road
	4	A329- London Road/B383 -Silwood Road
	5	B383- Silwood Road/Larch Ave
	6	B383- Station Road/High St
	7	B383- Station Road/B383- Broomhall Lane
	8	A30 - London Road/AB383- Broomhall Lane
	9	A30 -London Road/Charters Road
	10	A30- London Road/A330- Devenish Rd
	11	A330- Devenish Road/Charters Road

Name	TP	Description
	12	A330- Devenish Road/B3020- Bagshot Road
	13	A330 - Brockenhurst Road/Coronation Road
	14	A330 - Station Hill/Ascot (Station)
	15	A330- Station Hill/A329- High St
JT 7 ACW	1	A330- Station Hill/A329- High St
	2	A330 - Station Hill/Ascot (Station)
	3	A330 - Brockenhurst Road/Coronation Road
	4	A330- Devenish Road/B3020- Bagshot Road
	5	A330- Devenish Road/Charters Road
	6	A30- London Road/A330- Devenish Rd
	7	A30 -London Road/Charters Road
	8	A30 - London Road/AB383- Broomhall Lane
	9	B383- Station Road/B383- Broomhall Lane
	10	B383- Station Road/High St
	11	B383- Silwood Road/Larch Ave
	12	A329- London Road/B383 -Silwood Road
	13	A329 - London Road.B3020- Sunninghill Road
	14	A330 - Winkfield Road/A329 London Rd
	15	A330- Station Hill/A329- High St WB
JT 8 EB	1	A329 - London Rd/A3095 - Church Road EB
	2	A329- London Road/Eastern Rd Rbt EB
	3	A329- London Road/Broad Lane EB
	4	A329- London Rd/Long Hill Road EB
	5	A329 -London Road/B3017- Prioory Road
	6	A329- London Road/Fernbank Rd
	7	A332- Windsor Rd/A329- London Rd EB
	8	A330- Station Hill/A329- High St WB
	9	A330 - Winkfield Road/A329 London Rd
	10	A329 - London Road.B3020- Sunninghill Road EB
	11	A329- London Road/B383 -Silwood Road
	12	A321- London Road/Blacknest Gate Road
	13	A30 - London Road/A329- Blacknest road
JT 8 WB	1	A30 - London Road/A329- Blacknest Road
	2	A321- London Road/Blacknest Gate Road
	3	A329- London Road/B383 -Silwood Road
	4	A329 - London Road.B3020- Sunninghill Road WB

Name	TP	Description
	5	A330 - Winkfield Road/A329 London Rd
	6	A330- Station Hill/A329- High St EB
	7	A332- Windsor Road/A329- London Rd WB
	8	A329- London Road/Fernbank Rd
	9	A329 -London Road/B3017- Priory Road
	10	A329- London Rd/Long Hill Road WB
	11	A329- London Road/Broad Lane WB
	12	A329- London Road/Eastern Rd Rbt WB
	13	A329 - London Rd/A3095 - Church Road WB
JT 9 EB	1	A404(M)/A4- Bath Road EB
	2	A1404(M) On-slip (South) EB
	3	M4/A404(M) EB
	4	M4 (East)/On-slip from A4
	5	M4 Off-slip/A355 -Tuns Lane EB
	6	M4 On-slip/A355- Tuns Lane EB
	7	M4 Off-Slip/A4- London Road EB
JT 9 WB	1	M4 On-Slip/A4- London Road WB
	2	M4 Off-slip/A355 -Tuns Lane WB
	3	M4 On-Slip/A355- Tuns Lane WB
	4	M4(West)/On-slip from A4
	5	M4/A404(M) WB
	6	A404(M) On-Slip (North) WB
	7	A404(M)/A4- Bath Road WB



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